



2020-2021

# SPEED TIGER

*Infinity Power Precision Technology*

[www.speedtiger.com.tw](http://www.speedtiger.com.tw)



Speed Tiger Precision Technology Co., Ltd. was founded in 1998. It is not only the largest cutting tools manufacturer, but also the first one that combined coating technology. We have up to 160 sales locations in 42 major industrial countries from Europe, America, Japan, etc.

震虎精密科技股份有限公司創立於 1998 年，不僅為台灣最具規模的銑刀廠，也是台灣第一家結合鍍層的銑刀廠。全球有 160 個銷售據點，遍及歐美日等 42 國。

## VISION 企業願景

Be the BEST Asian manufacturer in cutting tools market, and assist enterprises in using high efficient cutting tools to produce high quality and innovative products.

成為刀具市場中最卓越的華人廠商，協助企業使用現代高效刀具走向高品質、創新產品。

## VALUES 價值觀

Integrity 誠信正直

Quality Assurance 堅持品質

Customer Satisfaction 顧客滿意

## QUALITY POLICY 品質政策

Continual Improvement、Customer Satisfaction

持續改進、顧客滿意

New Head Office  
台中精密園區營運中心



## Advanced Production Technology 先進的生產技術

SPEED TIGER introduced the latest technology and facilities, and have more than 100 sets of grinding machine from Germany, Switzerland, Japan and Taiwan. We have been increasing our productivity to do mass production and produce customized tools in a short time, and match up with the updating requests.

不斷引進德國、瑞士、日本、台灣等最新自動化的機種與技術，設備達 100 餘台，俱備短時間量產與客製化生產能力，迅速因應現今市場日新月異的需求變化。



## Professional Coating Technology 專業的塗層技術

Speed Tiger introduced coating technology and equipments from Switzerland in 2004, and became the first manufacturer combining cutting tools with coating techniques. We are also good at developing many kinds of coating based on customers' processed requests and eventually become an eco friendly cutting tools company.

先進刀具塗層技術與設備，為台灣首家將精密刀具與科技塗層技術整合的企業，擅長依據客戶需求去研發各種專用塗層，達到綠能加工生產的要求。



## Strict Quality Control System 嚴苛的品管制度

Ahead of others, Speed Tiger developed auto-inspect machines with our collaboration factory. From raw materials to finished products, we insist on high standard of inspection system, to make sure every product share equivalent and stable quality.

領先業界與獨家廠商合作研發刀具自動全檢機，由進料到出貨，要求各項品檢量測制度最高標準，確保每個產品的品質一致，使客戶製程與加工件品質穩定。



## Highest Precision Indication $\pm 2 \mu\text{m}$ 奈米級公差標示 $\pm 2 \mu\text{m}$

Speed Tiger cutting tool's tolerance indication entered the nanometer level precision; the world highest precision size  $\pm 2 \mu\text{m}$  in faith value enables the user to grasp the cutting tool's news thoroughly, understood how to request the cutting tool quality

$2 \mu\text{m}$  內的信賴數值讓使用者對切削刀具的訊息掌握得更徹底、更懂得如何要求刀具品質。





## Taiwan No.1- Identity Number 台灣首創-刀具生產履歷

Speed Tiger built the End Mills Traceability System in order to ensure the accountability of each process participants, from incoming raw material to finished products, of any production procedure. Once there is any doubt about our cutting tools, we will track its "identity number", and then clarify the problem and recall the products promptly, to lower the damage and loss caused by the issue.

震虎建立刀具生產履歷追溯系統，可賦予從進料到出貨等生產流程中所有參與者明確責任，一旦刀具發生任何疑慮，能根據每支刀具上的『生產履歷條碼』，快速釐清責任並及時從市場中移除問題刀具，降低該等事件對其他使用者的危害及損失。



## Well-rounded and Rapid Service 全方位的迅速服務

Speed Tiger Test Center is dedicated to innovative R&D and cutting test, in order to quickly solve our customers' various processing problems, and help them reduce processing time and costs. That's why we can become the best milling adviser.

刀具應用中心致力於創新研發、切削測試，解決客戶各種加工難題，能迅速協助降低客戶加工時間與成本，成為客戶最佳銑削顧問。



## Customized Services 客製化服務

Speed Tiger offers not only the high efficient cutting tools, but also advice and guidance about the idea through to implementation of the customized machining process. In collaboration with customers, we work continuously to develop innovative solutions to the most varied of problems in the most varied of processing requests. We are the people to contact if you need special tools for special machining tasks.

震虎不僅銷售合適的高效刀具，也提供關於訂製刀具的諮詢與建議。我們與客戶密切合作，為各行各業的不同加工需求持續開發新的解決方案。如果您正在為特殊的加工而在找特殊的刀具，我們將會是您適合的合作夥伴。



## Products Index 產品索引

**Product Lines**  
產品別

**Application & Series**  
應用&系列

**Page**  
頁數

| Product Line<br>產品別                  | Application<br>應用別          | Series<br>系列  | Page<br>頁碼 |
|--------------------------------------|-----------------------------|---|------------|
| Metric Carbide End Mills<br>公制-鎢鋼立銑刀 | General Series<br>泛用系列      | 600 PLUS Series - Taper Core Design for General Application<br>高效系列 - 不等心厚刀型設計  | 33         |
|                                      |                             | 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計  | 78         |
|                                      |                             | 200 PLUS Series - Unequal Flute Spacing & Unequal Leads Design for High Hardness Exotic Materials<br>難切削材高效刀具系列 - 不等分割、不等導程設計 | 115        |
|                                      | Non-Ferrous Series<br>非鐵用系列 | General Series for Non-Ferrous<br>銅鋁合金專用刀   | 152        |
|                                      |                             | High Speed Series for Non-Ferrous<br>高速鋁用刀  | 174        |
|                                      |                             | Aerospace - High Speed Series for Aluminum<br>航太用 - 高速鋁用刀   | 177        |
|                                      | Functional Series<br>功能性系列  | Titanium Nickel / Inconel Alloy<br>鈦利嘴系列  | 186        |
|                                      |                             | RS Series - Anti-Wear<br>超潤滑系列  | 192        |
|                                      |                             | FHP Series - Heavy Duty<br>強力高速重切削銑刀系列  | 216        |
|                                      |                             | FHP+ Series - Heavy Duty Plus<br>高速重切削粗精銑刀系列  | 224        |
|                                      |                             | HPSS Series - High Speed Plugging & Slotting & Side Milling<br>插溝側三合一重切削銑刀系列  | 228        |
|                                      |                             | KK Series - Multi Flutes High Efficiency<br>多刃高效立銑刀   | 232        |
|                                      |                             | SH Series - Super High Hardness & Super High Speed Cutting<br>超高硬度 & 超高速加工系列  | 238        |
|                                      |                             | Big Foot Series - Double Removal Rate<br>高移除率球刀系列   | 242        |
|                                      |                             | SUS Series - Stainless Steel Expert<br>不鏽鋼專用系列  | 246        |
|                                      |                             | Multi-function Series CDM<br>多功能銑刀  | 248        |

**01** Product Lines divided to 8 parts:  
產品索引：根據震虎產品種類區分成8個類別：

1. Metric-Carbide End Mills 公制-鎢鋼立銑刀
2. Fractional-Carbide End Mills 英制-鎢鋼立銑刀
3. High Efficient Cutting System 燒結系統
4. Insert & Insert Holder 刀片&刀片刀桿
5. Spot Drill Chamfer Mill Insert Set 定點鑽/倒角刀組
6. Position Drills 定位鑽
7. Reamer 銑刀
8. Turning Tool 車刀

**02** Determine the material to be machined, and there are 3 main application you can refer to.  
系列索引：根據加工應用需求挑選您要的刀具

1. General Application 泛用系列
2. Non-Ferrous 非鐵用系列
3. Functional Application 功能型系列
4. Shrink Fit System 燒結系統
5. Others 其他

**03** You will find the page!  
最後，即可找到商品對應的頁碼！

**Step 1** Select your cutting application  
選擇加工材質

**Step 2** Choose tools type  
選擇需求刀具類型

**Step 3** Find the page  
隨即得到對應的頁碼

| End Shape<br>刃端形狀  | Type<br>刀型                      | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                           |                     |                             |                       |                        |   |   |   | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |   |   |                                       |  |  |
|--|---------------------------------|------------|-------------|-------------|---------------|-----------------|----------------|----------|---------------------------|---------------------|-----------------------------|-----------------------|------------------------|---|---|---|--------------|------------------------------|---|---|---------------------------------------|--|--|
|  |                                 |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | Aluminum alloy<br>鋁合金 / 鋁 | Copper alloy<br>銅合金 | Nickel/Inconel alloy<br>鈦合金 | Titanium alloy<br>鈦合金 | Stainless steel<br>不銹鋼 | High-hardened steel under 65HRC<br>高硬度鋼 (65HRC以下) | High-hardened steel under 60HRC<br>高硬度鋼 (60HRC以下) | High-hardened steel under 55HRC<br>高硬度鋼 (55HRC以下) |              |                              | High-hardened steel under 50HRC<br>高硬度鋼 (50HRC以下) | Pre-hardened steel under 45HRC<br>預硬鋼 (45HRC以下) | Carbon steel, Alloy steel<br>碳鋼 / 合金鋼 |  |  |
| 600 PLUS Series - Taper Core Design for General Application<br>高效系列 - 不等心厚刀型設計 |                                 |            |             |             |               |                 |                |          |                           |                     |                             |                       |                        |   |   |   |              |                              |   |   |                                       |  |  |
| Square<br>平刀   | Miniature Square Type<br>微小徑立銑刀 | P-MIE      | 2           |             | ALTBN         | ○               | ○              |          |                           |                     |                             |                       |                        |   |   |   |              | ○                            | ○   |   |                                       |  |  |
|  |                                 |            |             |             |               | ◎               | ◎              | ◎        | ○                         |                     |                             |                       |                        |   |   |   |              |                              |   |   |                                       |  |  |
|  |                                 |            |             |             |               | ○               | ○              | ○        | ◎                         |                     |                             |                       |                        |   |   |   |              |                              |   |   |                                       |  |  |
|  |                                 |            |             |             |               | ◎               | ◎              | ◎        | ○                         |                     |                             |                       |                        | ◎   | ○   | ○   |              |                              |   |   |                                       |  |  |

- 1 Series Name 系列名稱
- 2 End Mill Type – Flutes 刀型-刃數
- 3 Cutting Condition Page 切削條件頁碼
- 4 Series / HRC / Helix Angle / Design 系列 / 硬度 / 螺旋角度 / 刀型設計
- 5 Tool's Photo 刀具圖片
- 6 Dimension 規格

**SPEED TIGER**
**Square**
立銑刀

1 **600<sup>+</sup>** 切削條件 P333 Cutting Condition 3

2 **2刃立銑刀**

4 **600 PLUS** **HRC 45** **35°** **b>a**

5

6 **Micro Grain Carbide** WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6µm

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiN | TiSiN | ZrN-A |
| 1            | 3            | 50          | 3              | 2      | P-SSE0102          | .00        | .01   | .02   | .03   |
| 1            | 3            | 50          | 4              | 2      | P-MSE0102          | .00        | .01   | .02   | .03   |
| 1.5          | 4            | 50          | 3              | 2      | P-SSE0152          | .00        | .01   | .02   | .03   |
| 1.5          | 4            | 50          | 4              | 2      | P-MSE0152          | .00        | .01   | .02   | .03   |
| 2            | 6            | 50          | 3              | 2      | P-SSE0202          | .00        | .01   | .02   | .03   |
| 2            | 6            | 50          | 4              | 2      | P-MSE0202          | .00        | .01   | .02   | .03   |
| 2.5          | 8            | 50          | 3              | 2      | P-SSE0252          | .00        | .01   | .02   | .03   |
| 2.5          | 8            | 50          | 4              | 2      | P-MSE0252          | .00        | .01   | .02   | .03   |
| 3            | 8            | 50          | 3              | 2      | P-SSE0302          | .00        | .01   | .02   | .03   |
| 3            | 8            | 50          | 4              | 2      | P-MSE0302          | .00        | .01   | .02   | .03   |
| 3.5          | 10           | 50          | 4              | 2      | P-MSE0352          | .00        | .01   | .02   | .03   |
| 4            | 11           | 50          | 4              | 2      | P-MSE0402          | .00        | .01   | .02   | .03   |
| 1            | 3            | 50          | 6              | 2      | P-SE0102           | .00        | .01   | .02   | .03   |
| 1.5          | 4            | 50          | 6              | 2      | P-SE0152           | .00        | .01   | .02   | .03   |
| 2            | 6            | 50          | 6              | 2      | P-SE0202           | .00        | .01   | .02   | .03   |
| 2.5          | 8            | 50          | 6              | 2      | P-SE0252           | .00        | .01   | .02   | .03   |
| 3            | 8            | 50          | 6              | 2      | P-SE0302           | .00        | .01   | .02   | .03   |
| 3.5          | 10           | 50          | 6              | 2      | P-SE0352           | .00        | .01   | .02   | .03   |
| 4            | 11           | 50          | 6              | 2      | P-SE0402           | .00        | .01   | .02   | .03   |
| 4.5          | 13           | 50          | 6              | 2      | P-SE0452           | .00        | .01   | .02   | .03   |

7.1 **Coating Purchase Code: Choose your coating by our code. Ex: P-SE0452 ZrN-A purchase code is P-SE0452.03**  
塗層採購: 選擇您要的塗層代碼, 如: P-SE0504 ZrN-A採購代碼為P-SE0504.03

7.2 **Application 適用材質:**

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pa-titan steel 鈦合金 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不銹鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|--------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | <45HRC             | -50HRC             | -55HRC | -60HRC | -65HRC |                     |                    |                           |                     |                    |
| ALTiN      | ○                                  | ○                  | ○                  | ○      |        |        | ○                   |                    |                           | ○                   | ○                  |
| TiSiN      | ○                                  | ○                  | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ○                  | ○                  | ○      |        |        | ○                   | ○                  |                           |                     |                    |

★ Perfect 最佳適配    ◎ Excellent 優良適配    ○ Good 佳

Unit/單位: mm

[www.speedtiger.com.tw](http://www.speedtiger.com.tw) 37

7.1 Coating Purchase Code: Choose your coating by our code. Ex: P-SE0452 ZrN-A purchase code is P-SE0452.03  
塗層採購: 選擇您要的塗層代碼, 如: P-SE0504 ZrN-A採購代碼為P-SE0504.03

7.2 Recommended Application 適用材質:  
The advantage of each coating is difference, so we provide our best suggestion through circle/star sign for your reference.  
因各塗層的優勢不同, 我們以圈圈/星號符號表示我們的最佳建議。



## Tool Materials 鈷鋼材質

|   |   |   |   |
|---|---|---|---|
| <b>600 Nano</b> Tungsten Carbide<br>600 Nano<br>鈷鋼600奈米     | <b>400 Nano</b> Tungsten Carbide<br>400 Nano<br>鈷鋼400奈米     | <b>200 Nano</b> Tungsten Carbide<br>200 Nano<br>鈷鋼200奈米 | <b>600 PLUS</b> Tungsten Carbide<br>600 PLUS<br>鈷鋼600奈米PLUS |
| <b>400 PLUS</b> Tungsten Carbide<br>400 PLUS<br>鈷鋼400奈米PLUS | <b>200 PLUS</b> Tungsten Carbide<br>200 PLUS<br>鈷鋼200奈米PLUS |   |   |

## Coating 塗層

請參考P470塗層特色 Please refer to P470 for coating advantage.

|   |   |   |   |
|---|---|---|---|
| <b>ZrN-A</b> ZrN-A Coating<br>ZrN-A 鍍層    | <b>ZrN-S</b> ZrN-S Coating<br>ZrN-S 鍍層    | <b>ALTIBN</b> ALTIBN Coating<br>ALTIBN 鍍層 | <b>P-nACo</b> P-nACo Coating<br>P-nACo 鍍層 |
| <b>TiSiN+</b> TiSiN+ Coating<br>TiSiN+ 鍍層 | <b>SH+ZrN</b> SH+ZrN Coating<br>SH+ZrN 鍍層 | <b>nACo</b> nACo Coating<br>nACo 鍍層       | <b>nACRo</b> nACRo Coating<br>nACRo 鍍層    |
| <b>TB</b> TB Coating<br>TB 鍍層             | <b>RS</b> RS Coating<br>RS 鍍層             | <b>TiSiN</b> TiSiN Coating<br>TiSiN 鍍層    | <b>TiCN</b> TiCN Coating<br>TiCN 鍍層       |
| <b>SH</b> SH Coating<br>SH 鍍層             | <b>nBS</b> nBS Coating<br>nBS 鍍層          | <b>SS</b> SS Coating<br>SS 鍍層             | <b>SSA</b> SSA Coating<br>SSA 鍍層          |

## Helix Angle 螺旋角度

|  |                       |                             |                             |
|--|-----------------------|-----------------------------|-----------------------------|
| Helix Angle $\theta$<br>切削刃角度 $\theta$ | Unequal leads<br>不等導程 | Unequal Helix Angle<br>不等螺旋 | Unequal Helix Angle<br>不等螺旋 |
|--|-----------------------|-----------------------------|-----------------------------|

## ADDITIONAL GEOMETRY 幾何設計

















|  |                               |                                 |                                   |
|--|-------------------------------|---------------------------------|-----------------------------------|
| Taper Core<br>不等心厚   | Unequal Flute Spacing<br>不等分割 | Unequal Flute Spacing<br>不等分割   | Unequal Flute Spacing<br>不等分割     |
| Corner Radius<br>圓鼻角度  | Rake Angle<br>切削前角            | Special Groove Geometry<br>特殊溝底 | Edge Conditioning<br>刀口鈍化         |
| Protective Chamfer<br>刀口倒角   | Free Space<br>特殊外徑角           | Sharp-edged<br>端角尖角             | Protective Chamfer of 45°<br>端角倒角 |
| Partially Polished Edge<br>端角保護角                                   | Special Chip Breaker<br>特殊溝型  | Front Chamfer<br>拋光             | Double Rake Angle<br>雙前角          |
| High precision radius accuracy<br>request is available<br>高精度R值可訂製 |                               |                                 |                                   |

















## Tools Specification 加工硬度














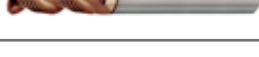
|  |  |  |  |
|--|--|--|--|
| <b>HRC 40</b> Working Hardness 40°<br>加工硬度 40° | <b>HRC 45</b> Working Hardness 45°<br>加工硬度 45° | <b>HRC 50</b> Working Hardness 50°<br>加工硬度 50° | <b>HRC 55</b> Working Hardness 55°<br>加工硬度 55° |
| <b>HRC 60</b> Working Hardness 60°<br>加工硬度 60° | <b>HRC 65</b> Working Hardness 65°<br>加工硬度 65° |  |  |

| Product Line<br>產品別                                  | Application<br>應用別  | Series<br>系列  | Page<br>頁碼 |
|--|---|---|------------|
| Metric<br>Carbide End Mills<br>公制-鎢鋼立銑刀              | General Series<br>泛用系列  | 600 PLUS Series - Taper Core Design for General Application<br>高效系列 - 不等心厚刀型設計  | 33         |
|  |   | 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計  | 78         |
|  |   | 200 PLUS Series - Unequal Flute Spacing & Unequal Leads Design for High Hardness Exotic Materials<br>難切削材高效刀具系列 - 不等分割、不等導程設計 | 115        |
|  | Non-Ferrous Series<br>非鐵用系列                                     | General Series for Non-Ferrous<br>銅鋁合金專用刀   | 152        |
|  |   | High Speed Series for Non-Ferrous<br>高速鋁用刀  | 174        |
|  |   | Aerospace - High Speed Series for Aluminum<br>航太用 - 高速鋁用刀   | 177        |
|  | Functional Series<br>功能性系列                                      | Titanium Nickel / Inconel Alloy<br>鈦利嘴系列  | 186        |
|  |   | RS Series - Anti-Wear<br>超潤滑系列  | 192        |
|  |   | FHP Series - Heavy Duty<br>強力高速重切削銑刀系列  | 216        |
|  |   | FHP+ Series - Heavy Duty Plus<br>高速重切削粗精銑刀系列  | 224        |
|  |   | HPSS Series - High Speed Plugging & Slotting & Side Milling<br>插溝側三合一重切削銑刀系列  | 228        |
|  |   | KK Series - Multi Flutes High Efficiency<br>多刃高效立銑刀   | 232        |
|  |   | SH Series - Super High Hardness & Super High Speed Cutting<br>超高硬度 & 超高速加工系列  | 238        |
|  |   | Big Foot Series - Double Removal Rate<br>高移除率球刀系列   | 242        |
|  |   | SUS Series - Stainless Steel Expert<br>不鏽鋼專用系列  | 246        |
| Multi-function Series<br>CDM多功能銑刀                    | 248   |   |            |
| Fractional<br>Carbide End Mills<br>英制-鎢鋼立銑刀          | General Series<br>泛用系列  | 600 Nano Series<br>600 奈米系列   | 249        |
|  | Non-Ferrous Series<br>非鐵用系列                                     | High Speed Series for Non-Ferrous<br>超高速鋁用刀   | 253        |
|  | Functional Series<br>功能性系列                                      | 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列-不等分割、不等螺旋刀型設計  | 255        |
|  |   | 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>High Performance for Exotic Materials<br>難切削材高效刀具系列 - 不等分割、不等螺旋刀型設計 | 256        |
| High Efficient<br>Cutting System<br>燒結系統             | ST-3500 Induction Machine 3.5KW 電磁熱感應加熱水冷機組                     |   | 259        |
|  | Dual End Carbide Anti-Vibration Shrink Fit Extension 雙頭龍鎢鋼抗震延長桿 |   | 264        |
|  | Adapter 雙頭龍轉接座  |   | 266        |
|  | Power Tips - Replaceable End Mills Head 嶄露頭角 - 可替換刀頭立銑刀         |   | 268        |
| Insert & Insert Holder<br>刀片&刀片刀桿                    | General Series 泛用系列   | RD、WR、HN、CN、AP Series 系列  | 284        |
| Spot Drill<br>Chamfer Mill<br>Insert Set<br>定點鑽/倒角刀組 | For General Steel、Carbon Steel、Non-Ferrous 一般鋼、碳素鋼、非鐵合金適用       |   | 312        |
| Position Drills<br>定位鑽                               | Position Drill<br>定位鑽   | PDST Series<br>定位鑽  | 314        |
| Reamer 銜刀  | Carbide Reamer<br>鎢鋼銜刀  | RE Series<br>鎢鋼銜刀   | 318        |
|  | Carbide Edge Reamer<br>刃部鎢鋼頭銜刀                                  | REC Series<br>刃部鎢鋼頭銜刀   | 319        |
| Turning Tool 車刀                                      | Mini System For Small Space 小徑車削                                |   | 320        |

































| End Shape<br>刃端形狀  | Type<br>刀型                         | Mode<br>型號                      | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                             |  |  |  |  |  |                        |                       |                              |                         | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                       |     |     |     |
|--|------------------------------------|---------------------------------|-------------|---|---------------|---|--|--|--|--|--|------------------------|-----------------------|------------------------------|-------------------------|--------------|------------------------------|-----------------------|-----|-----|-----|
|  |                                    |                                 |             |   |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |  |  |  |  |  |                        |                       |                              |                         |              |                              |                       |     |     |     |
|  |                                    |                                 |             |   |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 預硬鋼 45HRC 以下<br>Pre-hardened steel under 45HRC | 預硬鋼 5HRC 以下<br>High-hardened steel under 50HRC | 高硬鋼 5HRC 以下<br>High-hardened steel under 55HRC | 高硬鋼 6HRC 以下<br>High-hardened steel under 60HRC | 高硬鋼 8HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金 / 鋁<br>Copper alloy |              |                              | 鋁合金<br>Aluminum alloy |     |     |     |
| <b>600 PLUS Series - Taper Core Design for General Application<br/>高效系列 - 不等心厚刀型設計</b> |                                    |                                 |             |   |               |   |  |  |  |  |  |                        |                       |                              |                         |              |                              |                       |     |     |     |
| Square<br>平刀   | Miniature<br>Square Type<br>微小徑立銑刀 | P-MIE                           | 2           |    |               | ○   | ○  |  |  |  |  |                        |                       |                              | ○                       | ○            | 36                           | 332                   |     |     |     |
|  |                                    |                                 |             |    | ALTiBN        | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ○                            |                         |              |                              |                       | 36  | 332 |     |
|  |                                    |                                 |             |    | TiSiN         | ○   | ○  | ○  | ◎  |  |  |                        |                       |                              |                         |              |                              |                       |     | 36  | 332 |
|  |                                    |                                 |             |   | ZrN-A         | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ◎                            | ○                       | ○            |                              |                       |     | 36  | 332 |
|  | Square Type<br>立銑刀                 | P-SSE<br>P-MSE<br>P-SE<br>(35°) | 2           |  |               | ○   | ○  |  |  |  |  |                        |                       |                              |                         | ○            | ○                            | 37                    | 333 |     |     |
|  |                                    |                                 |             |  | ALTiBN        | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ○                            |                         |              |                              |                       | 37  | 333 |     |
|  |                                    |                                 |             |  | TiSiN         | ○   | ○  | ○  | ◎  |  |  |                        |                       |                              |                         |              |                              |                       |     | 37  | 333 |
|  |                                    |                                 |             |  | ZrN-A         | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ◎                            | ○                       | ○            |                              |                       |     | 37  | 333 |
|  |                                    |                                 | 4           |  |               | ○   | ○  |  |  |  |  |                        |                       |                              |                         |              | ○                            | ○                     | 39  | 334 |     |
|  |                                    |                                 |             |  | ALTiBN        | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ○                            |                         |              |                              |                       |     | 39  | 334 |
|  |                                    |                                 |             |  | TiSiN         | ○   | ○  | ○  | ◎  |  |  |                        |                       |                              |                         |              |                              |                       |     | 39  | 334 |
|  |                                    |                                 |             |  | ZrN-A         | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ◎                            | ○                       | ○            |                              |                       |     | 39  | 334 |
|  |                                    | P-MPE<br>P-PE<br>(45°)          | 3           |  |               | ○   | ○  |  |  |  |  |                        |                       |                              |                         |              | ○                            | ○                     | 41  | 335 |     |
|  |                                    |                                 |             |  | ALTiBN        | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ○                            |                         |              |                              |                       |     | 41  | 335 |
|  |                                    |                                 |             |  | TiSiN         | ○   | ○  | ○  | ◎  |  |  |                        |                       |                              |                         |              |                              |                       |     | 41  | 335 |
|  |                                    |                                 |             |  | ZrN-A         | ◎   | ◎  | ◎  | ○  |  |  |                        |                       | ◎                            | ○                       | ○            |                              |                       |     | 41  | 335 |














| End Shape<br>刃端形狀  | Type<br>刀型                         | Mode<br>型號             | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                             |   |  |  |  |  |  |  |                        |                       |                              | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                         |                       |         |         |
|--|------------------------------------|------------------------|-------------|---|---------------|---|---|--|--|--|--|--|--|------------------------|-----------------------|------------------------------|--------------|------------------------------|-------------------------|-----------------------|---------|---------|
|  |                                    |                        |             |   |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |   |  |  |  |  |  |  |                        |                       |                              |              |                              |                         |                       |         |         |
|  |                                    |                        |             |   |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 低合金鋼 / 位相鋼<br>Low alloy steel / Bainite | 中合金鋼 / HRC 28-32<br>Medium alloy steel / HRC 28-32 | 高合金鋼 / HRC 32-45<br>High alloy steel / HRC 32-45 | 高合金鋼 / HRC 45-55<br>High alloy steel / HRC 45-55 | 高合金鋼 / HRC 55-60<br>High alloy steel / HRC 55-60 | 高合金鋼 / HRC 60-65<br>High alloy steel / HRC 60-65 | 高合金鋼 / HRC 65-70<br>High alloy steel / HRC 65-70 | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳基合金<br>Nickel/Inconel alloy |              |                              | 銅合金 / 鋁<br>Copper alloy | 鋁合金<br>Aluminum alloy |         |         |
| <b>600 PLUS Series - Taper Core Design for General Application<br/>高效系列 - 不等心厚刀型設計</b> |                                    |                        |             |   |               |   |   |  |  |  |  |  |  |                        |                       |                              |              |                              |                         |                       |         |         |
| Square<br>平刀   | Square Type<br>立銑刀                 | P-MPE<br>P-PE<br>(45°) | 4           |    |               | ○   | ○                                       |  |  |  |  |  |  |                        |                       | ○                            | ○            | 43                           | 334                     |                       |         |         |
|  |                                    |                        |             |    | ALTiBN        | ◎   | ◎                                       | ◎  | ○  |  |  |  |  | ○                      |                       |                              |              |                              |                         | 43                    | 334     |         |
|  |                                    |                        |             |    | TiSiN         | ○   | ○                                       | ○  | ◎  |  |  |  |  |                        |                       |                              |              |                              |                         |                       | 43      | 334     |
|  |                                    |                        |             |   | ZrN-A         | ◎   | ◎                                       | ◎  | ○  |  |  |  |  | ◎                      | ○                     | ○                            |              |                              |                         |                       | 43      | 334     |
|  | Long Shank<br>Square Type<br>長柄立銑刀 | P-SLE<br>P-MLE         | 2           |  |               | ○   | ○                                       |  |  |  |  |  |  |                        |                       |                              | ○            | ○                            | 45                      | 332                   |         |         |
|  |                                    |                        |             |  | ALTiBN        | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ○                      |                       |                              |              |                              |                         | 45                    | 332     |         |
|  |                                    |                        |             |  | TiSiN         | ○   | ○                                       | ○  | ○  |  |  |  |  |                        |                       |                              |              |                              |                         |                       | 45      | 332     |
|  |                                    |                        |             |  | ZrN-A         | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ◎                      | ○                     | ○                            |              |                              |                         |                       | 45      | 332     |
|  |                                    | P-LET                  | 2           |  |               | ○   | ○                                       |  |  |  |  |  |  |                        |                       |                              |              | ○                            | ○                       | 46                    | 336-337 |         |
|  |                                    |                        |             |  | ALTiBN        | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ○                      |                       |                              |              |                              |                         |                       | 46      | 336-337 |
|  |                                    |                        |             |  | TiSiN         | ○   | ○                                       | ○  | ○  |  |  |  |  |                        |                       |                              |              |                              |                         |                       | 46      | 336-337 |
|  |                                    |                        |             |  | ZrN-A         | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ◎                      | ○                     | ○                            |              |                              |                         |                       | 46      | 336-337 |
|  | Long Flute<br>Square Type<br>長刃立銑刀 | P-LET                  | 2           |  |               | ○   | ○                                       |  |  |  |  |  |  |                        |                       |                              | ○            | ○                            | 47                      | 338                   |         |         |
|  |                                    |                        |             |  | ALTiBN        | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ○                      |                       |                              |              |                              |                         | 47                    | 338     |         |
|  |                                    |                        |             |  | TiSiN         | ○   | ○                                       | ○  | ○  |  |  |  |  |                        |                       |                              |              |                              |                         |                       | 47      | 338     |
|  |                                    |                        |             |  | ZrN-A         | ◎   | ◎                                       | ○  | ○  |  |  |  |  | ◎                      | ○                     | ○                            |              |                              |                         |                       | 47      | 338     |

| End Shape<br>刃端形狀  | Type<br>刀型                              | Model<br>型號 | Flute<br>刃數   | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                             |   |   |   |   |   |                        |                       |                              |                         |                       | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |     |         |         |         |
|--|---|-------------|---|---|---------------|---|---|---|---|---|---|------------------------|-----------------------|------------------------------|-------------------------|-----------------------|--------------|------------------------------|-----|---------|---------|---------|
|  |   |             |   |   |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |   |   |   |   |   |                        |                       |                              |                         |                       |              |                              |     |         |         |         |
|  |   |             |   |   |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 預硬鋼 45HRC<br>Pre-hardened steel under 45HRC | 高硬鋼 5HRC<br>High-hardened steel under 50HRC | 高硬鋼 5HRC<br>High-hardened steel under 55HRC | 高硬鋼 6HRC<br>High-hardened steel under 60HRC | 高硬鋼 6HRC<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金 / 鋅<br>Copper alloy | 鋁合金<br>Aluminum alloy |              |                              |     |         |         |         |
| 600 PLUS Series - Taper Core Design for General Application<br>高效系列 - 不等心厚刀型設計 |   |             |   |   |               |   |   |   |   |   |   |                        |                       |                              |                         |                       |              |                              |     |         |         |         |
| Square<br>平刀   | Long Flute<br>Square Type<br>長刃立銼刀      | P-LET       | 4   |    |               | ○   | ○   |   |   |   |   |                        |                       |                              |                         | ○                     | ○            | 48                           | 339 |         |         |         |
|  |   |             |   |    | ALTiBN        | ◎   | ◎   | ○   | ○   |   |   |                        |                       | ○                            |                         |                       |              |                              |     | 48      | 339     |         |
|  |   |             |   |    | TiSiN         | ○   | ○   | ○   | ○   |   |   |                        |                       |                              |                         |                       |              |                              |     |         | 48      | 339     |
|  |   |             |   |  | ZrN-A         | ◎   | ◎   | ○   | ○   |   |   |                        |                       | ◎                            | ○                       | ○                     |              |                              |     |         | 48      | 339     |
|  | Long Neck<br>Square Type<br>深溝長頸立銼刀     | P-LNT       | 2   |  |               | ○   | ○   |   |   |   |   |                        |                       |                              |                         |                       | ○            | ○                            | 49  | 340-341 |         |         |
|  |   |             |   |  | ALTiBN        | ◎   | ◎   | ○   | ○   |   |   |                        | ○                     |                              |                         |                       |              |                              |     | 49      | 340-341 |         |
|  |   |             |   |  | TiSiN         | ○   | ○   | ○   | ○   |   |   |                        |                       |                              |                         |                       |              |                              |     |         | 49      | 340-341 |
|  |   |             |   |  | ZrN-A         | ◎   | ◎   | ○   | ○   |   |   |                        |                       | ◎                            | ○                       | ○                     |              |                              |     |         | 49      | 340-341 |
|  | Fine Pitch &<br>Roughing Type<br>粗精銼立銼刀 | P-NTA       | 3   |  | ALTiBN        | ◎   | ◎   | ○   |   |   |   |                        |                       |                              | ○                       |                       |              |                              | 52  | 342     |         |         |
|  |   |             |   |  | TiSiN         | ○   | ◎   | ○   | ○   |   |   |                        |                       |                              |                         |                       |              |                              |     | 52      | 342     |         |
|  |   |             |   |  | ZrN-A         | ◎   | ◎   | ○   |   |   |   |                        |                       | ○                            |                         |                       |              |                              |     |         | 52      | 342     |
|  |   | 4           |  | ALTiBN  | ◎             | ◎   | ○   |   |   |   |   |                        |                       |                              | ○                       |                       |              |                              | 53  | 343     |         |         |
|  |   |             |  | TiSiN   | ○             | ◎   | ○   | ○   |   |   |   |                        |                       |                              |                         |                       |              |                              |     | 53      | 343     |         |
|  |   |             |  | ZrN-A   | ◎             | ◎   | ○   |   |   |   |   |                        | ○                     |                              |                         |                       |              |                              |     | 53      | 343     |         |

| End Shape<br>刃端形狀  | Type<br>刀型                    | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材                             |   |  |  |  |  |                        |                       |                              |                     |                       | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |    |     |     |     |     |
|--|-------------------------------|------------|-------------|-------------|---------------|---|---|--|--|--|--|------------------------|-----------------------|------------------------------|---------------------|-----------------------|--------------|------------------------------|----|-----|-----|-----|-----|
|  |                               |            |             |             |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |   |  |  |  |  |                        |                       |                              |                     |                       |              |                              |    |     |     |     |     |
|  |                               |            |             |             |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 低合金鋼 / 45HRC<br>Low alloy steel under 45HRC | 中合金鋼 / 50HRC<br>Medium alloy steel under 50HRC | 高合金鋼 / 55HRC<br>High alloy steel under 55HRC | 高合金鋼 / 60HRC<br>High alloy steel under 60HRC | 高合金鋼 / 65HRC<br>High alloy steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金<br>Copper alloy | 鋁合金<br>Aluminum alloy |              |                              |    |     |     |     |     |
| <b>600 PLUS Series - Taper Core Design for General Application<br/>高效系列 - 不等心厚刀型設計</b> |                               |            |             |             |               |   |   |  |  |  |  |                        |                       |                              |                     |                       |              |                              |    |     |     |     |     |
| Square<br>平刀   | Roughing Type<br>粗銑立銑刀        | P-XTA      | 3           |             | ALTIBN        | ◎   | ◎   | ○  |  |  |  |                        |                       |                              |                     |                       | 54           | 344                          |    |     |     |     |     |
|  |                               |            |             |             | TiSiN         | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              |                     |                       |              |                              | 54 | 344 |     |     |     |
|  |                               |            |             |             | ZrN-A         | ◎   | ◎   | ○  |  |  |  |                        |                       |                              |                     |                       |              |                              |    | 54  | 344 |     |     |
|  |                               |            | 4           |             | ALTIBN        | ◎   | ◎   | ○  |  |  |  |                        |                       |                              |                     |                       |              |                              |    | 55  | 345 |     |     |
|  |                               |            |             |             | TiSiN         | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              |                     |                       |              |                              |    |     | 55  | 345 |     |
|  |                               |            |             |             | ZrN-A         | ◎   | ◎   | ○  |  |  |  |                        |                       |                              |                     |                       |              |                              |    |     | 55  | 345 |     |
|  | Taper Square<br>Type<br>斜度立銑刀 | P-TTA      | 2           |             | ALTIBN        | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              |                     |                       |              |                              | 56 | 346 |     |     |     |
|  |                               |            |             |             | TiSiN         | ○   | ◎   | ◎  | ○  |  |  |                        |                       |                              |                     |                       |              |                              |    |     | 56  | 346 |     |
|  |                               |            |             |             | ZrN-A         | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              | ○                   | ○                     |              |                              |    |     | 56  | 346 |     |
|  |                               |            | 2           |             | ALTIBN        | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              |                     |                       |              |                              |    |     | 60  | 346 |     |
|  |                               |            |             |             | TiSiN         | ○   | ◎   | ◎  | ○  |  |  |                        |                       |                              |                     |                       |              |                              |    |     |     | 60  | 346 |
|  |                               |            |             |             | ZrN-A         | ○   | ◎   | ○  | ○  |  |  |                        |                       |                              |                     |                       | ○            | ○                            |    |     |     | 60  | 346 |

| End Shape<br>刃端形狀  | Type<br>刀型                                  | Model<br>型號                      | Flute<br>刃數   | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                             |   |  |  |  |  |                        |                       |                              |                     |                           | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                       |         |         |         |
|--|---|----------------------------------|---|---|---------------|---|---|--|--|--|--|------------------------|-----------------------|------------------------------|---------------------|---------------------------|--------------|------------------------------|-----------------------|---------|---------|---------|
|  |   |                                  |   |   |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |   |  |  |  |  |                        |                       |                              |                     |                           |              |                              |                       |         |         |         |
|  |   |                                  |   |   |               | 碳鋼 / 合金鋼<br>Carbon steel / Alloy steel      | 預硬鋼 HRC 28-32<br>Pre-hardened steel under 45HRC | 高硬鋼 HRC 32-42<br>High-hardened steel under 50HRC | 高硬鋼 HRC 42-48<br>High-hardened steel under 55HRC | 高硬鋼 HRC 48-52<br>High-hardened steel under 60HRC | 高硬鋼 HRC 52-58<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金<br>Copper alloy | 鋁合金 / 鎂<br>Aluminum alloy |              |                              | 鈹合金<br>Aluminum alloy |         |         |         |
| <b>600 PLUS Series - Taper Core Design for General Application<br/>高效系列 - 不等心厚刀型設計</b> |   |                                  |   |   |               |   |   |  |  |  |  |                        |                       |                              |                     |                           |              |                              |                       |         |         |         |
| Ball Nose<br>球刀  | Miniature Ball<br>Nose Type<br>微小徑球型<br>立銼刀 | P-MIB                            | 2   |    |               | ○   | ○   |  |  |  |  |                        |                       |                              |                     | ○                         | ○            | 62                           | 347-348               |         |         |         |
|  |   |                                  |   |    | ALTIBN        | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ○                            |                     |                           |              |                              |                       | 62      | 347-348 |         |
|  |   |                                  |   |    | TiSiN         | ○   | ○   | ○  | ◎  |  |  |                        |                       |                              |                     |                           |              |                              |                       |         | 62      | 347-348 |
|  |   |                                  |   |   | ZrN-A         | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ◎                            | ○                   | ○                         |              |                              |                       |         | 62      | 347-348 |
|  | Ball Nose Type<br>球型立銼刀                     | P-SSB<br>P-MSB<br>P-SB           | 2   |  |               | ○   | ○   |  |  |  |  |                        |                       |                              |                     |                           | ○            | ○                            | 63                    | 349     |         |         |
|  |   |                                  |   |  | ALTIBN        | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ○                            |                     |                           |              |                              |                       | 63      | 349     |         |
|  |   |                                  |   |  | TiSiN         | ○   | ○   | ○  | ◎  |  |  |                        |                       |                              |                     |                           |              |                              |                       |         | 63      | 349     |
|  |   |                                  |   |  | ZrN-A         | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ◎                            | ○                   | ○                         |              |                              |                       |         | 63      | 349     |
|  |   | P-SLB<br>P-MLB<br>P-LLB<br>P-XLB | 2   |  |               | ○   | ○   |  |  |  |  |                        |                       |                              |                     |                           |              | ○                            | ○                     | 64      | 350     |         |
|  |   |                                  |   |  | ALTIBN        | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ○                            |                     |                           |              |                              |                       |         | 64      | 350     |
|  |   |                                  |   |  | TiSiN         | ○   | ○   | ○  | ◎  |  |  |                        |                       |                              |                     |                           |              |                              |                       |         | 64      | 350     |
|  |   |                                  |   |  | ZrN-A         | ◎   | ◎   | ◎  | ○  |  |  |                        |                       | ◎                            | ○                   | ○                         |              |                              |                       |         | 64      | 350     |
|  | Long Shank<br>Ball Nose Type<br>長柄球型立銼刀     | 2                                |  |   | ○             | ○   |   |  |  |  |  |                        |                       |                              |                     |                           | ○            | ○                            | 65                    | 347-348 |         |         |
|  |   |                                  |  | ALTIBN  | ◎             | ◎   | ○   | ○  |  |  |  |                        | ○                     |                              |                     |                           |              |                              |                       | 65      | 347-348 |         |
|  |   |                                  |  | TiSiN   | ○             | ○   | ○   | ○  |  |  |  |                        |                       |                              |                     |                           |              |                              |                       | 65      | 347-348 |         |
|  |   |                                  |  | ZrN-A   | ◎             | ◎   | ○   | ○  |  |  |  |                        | ◎                     | ○                            | ○                   |                           |              |                              |                       | 65      | 347-348 |         |
















| End Shape<br>刃端形狀  | Type<br>刀型                                   | Model<br>型號                    | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層   | Work Piece 被切削材                             |                         |                            |                          |                             |                             |                             |                             |                             |                        | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                       |                              |                     |                       |
|--|--|--------------------------------|-------------|---|---|---|-------------------------|----------------------------|--------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|------------------------|--------------|------------------------------|-----------------------|------------------------------|---------------------|-----------------------|
|  |  |                                |             |   |   | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |                         |                            |                          |                             |                             |                             |                             |                             |                        |              |                              |                       |                              |                     |                       |
|  |  |                                |             |   |   | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 低合金鋼<br>Low alloy steel | 中合金鋼<br>Medium alloy steel | 高合金鋼<br>High alloy steel | 高硬度鋼<br>High hardness steel | 高硬度鋼<br>High hardness steel | 高硬度鋼<br>High hardness steel | 高硬度鋼<br>High hardness steel | 高硬度鋼<br>High hardness steel | 不銹鋼<br>Stainless steel |              |                              | 鈦合金<br>Titanium alloy | 鎳基合金<br>Nickel/Inconel alloy | 銅合金<br>Copper alloy | 鋁合金<br>Aluminum alloy |
| <b>600 PLUS Series - Taper Core Design for General Application<br/>高效系列 - 不等心厚刀型設計</b> |  |                                |             |   |   |   |                         |                            |                          |                             |                             |                             |                             |                             |                        |              |                              |                       |                              |                     |                       |
| Ball Nose<br>球刀  | Long Neck<br>Ball Nose Type<br>深溝長頸球型<br>立銑刀 | P-LNBT                         | 2           |    |   | ○   | ○                       |                            |                          |                             |                             |                             |                             |                             | ○                      | ○            | 66                           | 351                   |                              |                     |                       |
|  |  |                                |             |    | ALTiBN  | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              |                       | 66                           | 351                 |                       |
|  |  |                                |             |    | TiSiN   | ○   | ○                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              |                       |                              | 66                  | 351                   |
|  |  |                                |             |    | ZrN-A   | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             | ◎                           | ○                           | ○                      |              |                              |                       |                              | 66                  | 351                   |
|  | Pencil Neck<br>Ball Nose Type<br>斜頸球型立銑刀     | P-PBTA                         | 2           |  | ALTiBN  | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              | 68                    | 352                          |                     |                       |
|  |  |                                |             |  | TiSiN   | ○   | ○                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              |                       | 68                           | 352                 |                       |
|  |  |                                |             |  | ZrN-A   | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             | ◎                           | ○                           | ○                      |              |                              |                       | 68                           | 352                 |                       |
|  | Taper Ball Nose<br>Type<br>斜度球型立銑刀           | P-TBTA                         | 2           |  | ALTiBN  | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              | 69                    | 352                          |                     |                       |
|  |  |                                |             |  | TiSiN   | ○   | ○                       | ○                          | ○                        |                             |                             |                             |                             |                             |                        |              |                              |                       | 69                           | 352                 |                       |
|  |  |                                |             |  | ZrN-A   | ◎   | ◎                       | ○                          | ○                        |                             |                             |                             | ◎                           | ○                           | ○                      |              |                              |                       | 69                           | 352                 |                       |
|  | Corner<br>Radius<br>圓鼻刀                      | Corner Radius<br>Type<br>圓鼻立銑刀 | P-RTA       | 2   |  |   | ○                       | ○                          |                          |                             |                             |                             |                             |                             |                        | ○            | ○                            | 71                    | 353                          |                     |                       |
|  |  |                                |             |   |  | ALTiBN                                      | ◎                       | ◎                          | ◎                        | ○                           |                             |                             |                             |                             |                        |              |                              |                       |                              | 71                  | 353                   |
|     |  |                                |             |   | TiSiN   | ○   | ○                       | ○                          | ◎                        |                             |                             |                             |                             |                             |                        |              |                              |                       |                              | 71                  | 353                   |
|     |  |                                |             |   | ZrN-A   | ◎   | ◎                       | ◎                          | ○                        |                             |                             |                             | ◎                           | ○                           | ○                      |              |                              |                       |                              | 71                  | 353                   |

| End Shape<br>刃端形狀  | Type<br>刀型                               | Model<br>型號 | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                        |  |   |   |   |   |                        |                       |                              |                         |                       |                            | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |     |     |     |
|--|--|-------------|-------------|---|---------------|--|--|---|---|---|---|------------------------|-----------------------|------------------------------|-------------------------|-----------------------|----------------------------|--------------|------------------------------|-----|-----|-----|
|  |  |             |             |   |               | ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳  |  |   |   |   |   |                        |                       |                              |                         |                       |                            |              |                              |     |     |     |
|  |  |             |             |   |               | 碳鋼 / 合金鋼<br>Carbon steel / Alloy steel | 預硬鋼 45HRC 以下<br>Pre-hardened steel under 45HRC | 預硬鋼 50HRC 以下<br>High-hardened steel under 50HRC | 高硬鋼 55HRC 以下<br>High-hardened steel under 55HRC | 高硬鋼 60HRC 以下<br>High-hardened steel under 60HRC | 高硬鋼 65HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金 / 鋅<br>Copper alloy | 鋁合金<br>Aluminum alloy | 錳合金 / 鐵<br>Manganese alloy |              |                              |     |     |     |
| 600 PLUS Series - Taper Core Design for General Application<br>高效系列 - 不等心厚刀型設計 |  |             |             |   |               |  |  |   |   |   |   |                        |                       |                              |                         |                       |                            |              |                              |     |     |     |
| Corner Radius<br>圓鼻刀   | Corner Radius Type<br>圓鼻立銼刀              | P-RTA       | 4           |    |               | ○                                      | ○  |   |   |   |   |                        |                       |                              |                         | ○                     | ○                          | 73           | 354                          |     |     |     |
|  |  |             |             |    | ALTIBN        | ◎                                      | ◎  | ◎   | ○   |   |   |                        |                       | ○                            |                         |                       |                            |              |                              | 73  | 354 |     |
|  |  |             |             |    | TiSiN         | ○                                      | ○  | ○   | ◎   |   |   |                        |                       |                              |                         |                       |                            |              |                              |     | 73  | 354 |
|  |  |             |             |  | ZrN-A         | ◎                                      | ◎  | ◎   | ○   |   |   |                        |                       | ◎                            | ○                       | ○                     |                            |              |                              |     | 73  | 354 |
|  | Long Shank Corner Radius Type<br>長柄圓鼻立銼刀 | P-LRTA      | 2           |  | ALTIBN        | ◎                                      | ◎  | ○   | ○   |   |   |                        |                       | ○                            |                         |                       |                            |              | 75                           | 353 |     |     |
|  |  |             |             |  | TiSiN         | ○                                      | ○  | ○   | ○   |   |   |                        |                       |                              |                         |                       |                            |              |                              | 75  | 353 |     |
|  |  |             |             |  | ZrN-A         | ◎                                      | ◎  | ○   | ○   |   |   |                        |                       | ◎                            | ○                       | ○                     |                            |              |                              |     | 75  | 353 |
|  |  |             |             |  | ALTIBN        | ◎                                      | ◎  | ○   | ○   |   |   |                        |                       | ○                            |                         |                       |                            |              |                              |     | 76  | 354 |
|  |  |             |             |  | TiSiN         | ○                                      | ○  | ○   | ○   |   |   |                        |                       |                              |                         |                       |                            |              |                              |     | 76  | 354 |
|  |  |             |             |  | ZrN-A         | ◎                                      | ◎  | ○   | ○   |   |   |                        |                       | ◎                            | ○                       | ○                     |                            |              |                              |     | 76  | 354 |
| 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計 |  |             |             |   |               |  |  |   |   |   |   |                        |                       |                              |                         |                       |                            |              |                              |     |     |     |
| Square<br>平刀   | Miniature Square Type<br>微小徑立銼刀          | P-UMIE      | 2           |  | ALTIBN        | ◎                                      | ◎  | ◎   | ◎   |   |   |                        | ○                     |                              |                         |                       |                            | 82           | 355                          |     |     |     |
|  |  |             |             |  | nACRo         | ◎                                      | ◎  | ◎   | ○   |   |   |                        | ○                     |                              |                         |                       |                            |              |                              | 82  | 355 |     |
|  |  |             |             |  | ZrN-S         | ◎                                      | ◎  | ◎   | ◎   |   |   |                        |                       | ◎                            | ○                       | ○                     |                            |              |                              |     | 82  | 355 |

| End Shape<br>刃端形狀  | Type<br>刀型  | Mode<br>型號 | Flute<br>刃數                        | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材                             |                                |  |  |  |  |  |  |  |  |  | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |  |     |     |
|--|---|------------|------------------------------------|-------------|---------------|---|--------------------------------|--|--|--|--|--|--|--|--|--|--------------|------------------------------|--|-----|-----|
|  |   |            |                                    |             |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |                                |  |  |  |  |  |  |  |  |  |              |                              |  |     |     |
|  |   |            |                                    |             |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 鉻鋼 / 鉻合金<br>Cr steel, Cr alloy | 鉻鎢鋼 / HRC 28-32<br>Cr-W steel, HRC 28-32 | 鉻鎢鋼 / HRC 33-38<br>Cr-W steel, HRC 33-38 | 鉻鎢鋼 / HRC 39-42<br>Cr-W steel, HRC 39-42 | 鉻鎢鋼 / HRC 43-48<br>Cr-W steel, HRC 43-48 | 鉻鎢鋼 / HRC 49-52<br>Cr-W steel, HRC 49-52 | 鉻鎢鋼 / HRC 53-58<br>Cr-W steel, HRC 53-58 | 鉻鎢鋼 / HRC 59-62<br>Cr-W steel, HRC 59-62 | 鉻鎢鋼 / HRC 63-68<br>Cr-W steel, HRC 63-68 | 鉻鎢鋼 / HRC 69-72<br>Cr-W steel, HRC 69-72 |              |                              | 鉻鎢鋼 / HRC 73-78<br>Cr-W steel, HRC 73-78 |     |     |
| <b>400 PLUS Series - Unequal Flute Spacing &amp; Helix Design<br/>抗震系列 - 不等分割、不等螺旋刀型設計</b> |   |            |                                    |             |               |   |                                |  |  |  |  |  |  |  |  |  |              |                              |  |     |     |
| Square<br>平刀   | Square Type<br>立銼刀                                      | P-UET      | 2                                  |             | ALTIBN        | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 84           | 356                          |  |     |     |
|  |   |            |                                    |             | nACRo         | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 84                           | 356                                      |     |     |
|  |   |            |                                    |             | ZrN-S         | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 84                           | 356                                      |     |     |
|  |   |            | 4                                  |             | ALTIBN        | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 85                           | 357                                      |     |     |
|  |   |            |                                    |             | nACRo         | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 85                           | 357                                      |     |     |
|  |   |            |                                    |             | ZrN-S         | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 85                           | 357                                      |     |     |
|  |   |            | Long Flute<br>Square Type<br>長刃立銼刀 | P-ULET      | 2             |   | ALTIBN                         | ◎  | ◎  | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○            | ○                            | 86                                       | 358 |     |
|  |   |            |                                    |             |               |   | nACRo                          | ◎  | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | ○                            | ○  | 86  | 358 |
|  |   |            |                                    |             |               |   | ZrN-S                          | ◎  | ◎  | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○            | ○                            | ○  | 86  | 358 |
|  | 4   |            |                                    |             | ALTIBN        | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 87                           | 359                                      |     |     |
|  |   |            |                                    |             | nACRo         | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 87                           | 359                                      |     |     |
|  |   |            |                                    |             | ZrN-S         | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○            | 87                           | 359                                      |     |     |
|  | Multiple Flutes<br>Square Type<br>多刃立銼刀                 | P-UVT      | 4                                  |             | ALTIBN        | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 88           | 360                          |  |     |     |
|  |   |            | 6                                  |             | nACRo         | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 88           | 360                          |  |     |     |
|  |   |            | 8                                  |             | ZrN-S         | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 88           | 360                          |  |     |     |
|  | Multiple Flutes<br>Long Flute<br>Square Type<br>多刃長刃立銼刀 | P-ULVT     | 6                                  |             | ALTIBN        | ◎   | ◎                              | ◎  | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 89           | 360                          |  |     |     |
|  |   |            | 8                                  |             | nACRo         | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 89           | 360                          |  |     |     |
|  |   |            |                                    | ZrN-S       | ◎             | ◎   | ◎                              | ◎  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | ○  | 89           | 360                          |  |     |     |



| End Shape<br>刃端形狀  | Type<br>刀型                              | Mode<br>型號              | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |  |   |  |  |  |  |  |                        | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                       |
|--|---|-------------------------|-------------|-------------|---------------|-----------------|----------------|----------|--|---|--|--|--|--|--|------------------------|--------------|------------------------------|-----------------------|
|  |   |                         |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | 低碳鋼 / 合金鋼<br>Carbon steel, Alloy steel | 預硬鋼 HRC 28-32<br>Pre-harden steel under 45HRC | 高硬鋼 HRC 32-42<br>High-hardened steel under 50HRC | 高硬鋼 HRC 42-48<br>High-hardened steel under 55HRC | 高硬鋼 HRC 48-52<br>High-hardened steel under 60HRC | 高硬鋼 HRC 52-58<br>High-hardened steel under 65HRC | 高硬鋼 HRC 58-62<br>High-hardened steel under 68HRC | 不銹鋼<br>Stainless steel |              |                              | 鈦合金<br>Titanium alloy |
| 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計 |   |                         |             |             |               |                 |                |          |  |   |  |  |  |  |  |                        |              |                              |                       |
| Square<br>平刀   | Long Neck<br>Square Type<br>深溝長頸立銑刀     | P-ULNT                  | 2<br>3      |             | ALTIBN        | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ○  |  |  |  | 90                     | 361-362      |                              |                       |
|  |   |                         |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                      | ○   |  | ○  |  |  |  |                        | 90           | 361-362                      |                       |
|  |   |                         |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ◎  | ○  | ○  |  |                        |              | 90                           | 361-362               |
| Ball Nose<br>球刀  | Miniature Ball<br>Nose Type<br>微小徑球型立銑刀 | P-UMIB                  | 2           |             | ALTIBN        | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ○  |  |  |  | 92                     | 363          |                              |                       |
|  |   |                         |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                      | ○   |  | ○  |  |  |  |                        | 92           | 363                          |                       |
|  |   |                         |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ◎  | ○  | ○  |  |                        |              | 92                           | 363                   |
|  | Ball Nose<br>球刀                         | Ball Nose Type<br>球型立銑刀 | P-UBT       | 2           |               | ALTIBN          | ◎              | ◎        | ◎                                      | ◎   | ○  |  | ○  |  |  |                        | 94           | 364                          |                       |
|  |   |                         |             |             |               | nACRo           | ◎              | ◎        | ◎                                      | ○   | ○  |  | ○  |  |  |                        |              | 94                           | 364                   |
|  |   |                         |             |             |               | ZrN-S           | ◎              | ◎        | ◎                                      | ◎   | ○  |  | ◎  | ○  | ○  |                        |              |                              | 94                    |
|  |   |                         |             | 4           |               | ALTIBN          | ◎              | ◎        | ◎                                      | ◎   | ○  |  | ○  |  |  |                        |              | 95                           | 364                   |
|  |   |                         |             |             |               | nACRo           | ◎              | ◎        | ◎                                      | ○   | ○  |  | ○  |  |  |                        |              | 95                           | 364                   |
|  |   |                         |             |             |               | ZrN-S           | ◎              | ◎        | ◎                                      | ◎   | ○  |  | ◎  | ○  | ○  |                        |              |                              | 95                    |
|  | Long Shank Ball<br>Nose Type<br>長柄球型立銑刀 | P-ULBT                  | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ○  |  |  |  | 95                     | 364          |                              |                       |
|  |   |                         |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                      | ○   |  | ○  |  |  |  |                        | 95           | 364                          |                       |
|  |   |                         |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                      | ○   |  | ◎  | ○  | ○  |  |                        |              | 95                           | 364                   |
| Power Short Flute<br>Ball Nose Type<br>強力短刃球型立銑刀                               | P-UBTSX                                 | 2                       |             | ALTIBN      | ◎             | ◎               | ◎              | ◎        | ○                                      |   | ○  |  |  |  | 96   | 365                    |              |                              |                       |
|  |   |                         |             | nACRo       | ◎             | ◎               | ◎              | ○        | ○                                      |   | ○  |  |  |  |  | 96                     | 365          |                              |                       |
|  |   |                         |             | ZrN-S       | ◎             | ◎               | ◎              | ◎        | ○                                      |   | ◎  | ○  | ○  |  |  |                        | 96           | 365                          |                       |

| End Shape<br>刃端形狀  | Type<br>刀型                                       | Mode<br>型號                    | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材 |                |          |                                       |   |  |  |  |  |                        |                       | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                              |
|--|--|-------------------------------|-------------|---|---------------|-----------------|----------------|----------|---------------------------------------|---|--|--|--|--|------------------------|-----------------------|--------------|------------------------------|------------------------------|
|  |  |                               |             |   |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel | 預硬鋼 / HRC 28-32<br>Pre-hardened steel under 45HRC | 硬質鋼 / HRC 32-40<br>High-hardened steel under 50HRC | 硬質鋼 / HRC 32-40<br>High-hardened steel under 55HRC | 硬質鋼 / HRC 32-40<br>High-hardened steel under 60HRC | 硬質鋼 / HRC 32-40<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy |              |                              | 鎳鉻合金<br>Nickel/Inconel alloy |
| <b>400 PLUS Series - Unequal Flute Spacing &amp; Helix Design<br/>抗震系列 - 不等分割、不等螺旋刀型設計</b> |  |                               |             |   |               |                 |                |          |                                       |   |  |  |  |  |                        |                       |              |                              |                              |
| Ball<br>Nose<br>球刀   | Long Shank Ball<br>Nose Type<br>長柄球型立銼刀          | P-ULBTS<br>P-ULBTM<br>P-ULBTL | 2           |    | ALTIBN        | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ○  | ○  | ○                      | ○                     | 97           | 365                          |                              |
|  |  |                               |             |    | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   | ○  | ○  | ○  | ○  | ○                      | ○                     | ○            | 97                           | 365                          |
|  |  |                               |             |    | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ◎  | ○  | ○                      | ○                     | ○            | 97                           | 365                          |
|  | Long Neck Ball<br>Nose Type<br>深溝長頸球型立銼刀         | P-ULNBT                       | 2           |  | ALTIBN        | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ○  | ○  | ○                      | ○                     | 98           | 366-367                      |                              |
|  |  |                               |             |  | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   | ○  | ○  | ○  | ○  | ○                      | ○                     | 98           | 366-367                      |                              |
|  |  |                               |             |  | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ◎  | ○  | ○  | ○                      | ○                     | 98           | 366-367                      |                              |
|  | Pencil Neck<br>Ball Nose Type<br>深溝斜頸球型立銼刀       | P-UPBT                        | 2           |  | ALTIBN        | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ○  | ○  | ○                      | 100                   | 368          |                              |                              |
|  |  |                               |             |  | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   | ○  | ○  | ○  | ○  | ○                      | 100                   | 368          |                              |                              |
|  |  |                               |             |  | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ◎  | ○  | ○  | ○                      | 100                   | 368          |                              |                              |
|  | Pencil Long Neck<br>Ball Nose Type<br>深溝長斜頸球型立銼刀 | P-ULPBT                       | 2           |  | ALTIBN        | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ○  | ○  | ○                      | 101                   | 368          |                              |                              |
|  |  |                               |             |  | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   | ○  | ○  | ○  | ○  | ○                      | 101                   | 368          |                              |                              |
|  |  |                               |             |  | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ◎  | ○  | ○  | ○                      | 101                   | 368          |                              |                              |
| Corner<br>Radius<br>圓鼻刀  | Corner Radius<br>Type<br>圓鼻立銼刀                   | P-URTA                        | 2           |  | ALTIBN        | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ○  | ○  | ○  | 102                    | 369                   |              |                              |                              |
|  |  |                               |             |  | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   | ○  | ○  | ○  | ○  | 102                    | 369                   |              |                              |                              |
|  |  |                               |             |  | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   | ○  | ◎  | ○  | ○  | ○                      | 102                   | 369          |                              |                              |

















| End Shape<br>刃端形狀  | Type<br>刀型                                      | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                                       |   |  |  |  |                        |                       |                              | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
|--|---|------------|-------------|-------------|---------------|-----------------|----------------|----------|---------------------------------------|---|--|--|--|------------------------|-----------------------|------------------------------|--------------|------------------------------|
|  |   |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel | 預硬鋼 45 HRC 以下<br>Pre-harden steel under 45HRC | 預硬鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 預硬鋼 60 HRC 以下<br>High-hardened steel under 60HRC | 預硬鋼 65 HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy |              |                              |
| 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計 |   |            |             |             |               |                 |                |          |                                       |   |  |  |  |                        |                       |                              |              |                              |
| Corner Radius<br>圓鼻刀   | Corner Radius Type<br>圓鼻立銼刀                     | P-URTA     | 4           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        |                       | 104                          | 370          |                              |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       | 104                          | 370          |                              |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ○  | ○                      |                       |                              | 104          | 370                          |
|  | Pencil Neck<br>Corner Radius Type<br>斜頸圓鼻立銼刀    | P-UCRS     | 2           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        |                       | 105                          | 371          |                              |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       | 105                          | 371          |                              |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ○  | ○                      |                       |                              | 105          | 371                          |
|  |   |            | 4           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        |                       |                              | 107          | 372                          |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       |                              | 107          | 372                          |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ○  | ○                      |                       |                              | 107          | 372                          |
|  | Long Neck Corner<br>Radius Nose Type<br>長頸圓鼻立銼刀 | P-UCR      | 4           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        |                       | 109                          | 373          |                              |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       | 109                          | 373          |                              |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ○  | ○                      |                       |                              | 109          | 373                          |
| Square<br>平刀   | Square Type<br>不等立銼刀                            | PVE        | 4           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        | 110                   | 374-379                      |              |                              |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       | 110                          | 374-379      |                              |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ◎  | ★                      | ○                     | ○                            | 110          | 374-379                      |
|  | Square Type<br>Short Flute<br>1倍刃長不等立銼刀         | PVES       | 4           |             | ALTiBN        | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ○  |  |                        |                       | 111                          | 374-379      |                              |
|  |   |            |             |             | nACRo         | ◎               | ◎              | ◎        | ○                                     | ○   |  | ○  |  |                        |                       |                              | 111          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎               | ◎              | ◎        | ◎                                     | ○   |  | ◎  | ◎  | ★                      | ○                     | ○                            | 111          | 374-379                      |

| End Shape<br>刃端形狀  | Type<br>刀型  | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材                         |   |   |   |   |                        |                       |                               |                         |                       |         | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
|--|---|------------|-------------|-------------|---------------|---|---|---|---|---|------------------------|-----------------------|-------------------------------|-------------------------|-----------------------|---------|--------------|------------------------------|
|  |   |            |             |             |               | ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳   |   |   |   |   |                        |                       |                               |                         |                       |         |              |                              |
|  |   |            |             |             |               | 碳素鋼 / 合金鋼<br>Carbon steel / Alloy steel | 預硬鋼 51 HRC 以下<br>Pre-harden steel under 45HRC | 硬鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 硬鋼 60 HRC 以下<br>High-hardened steel under 60HRC | 硬鋼 65 HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻鈦合金<br>Nickel/Inconel alloy | 銅合金 / 鋁<br>Copper alloy | 鋁合金<br>Aluminum alloy |         |              |                              |
| 400 PLUS Series - Unequal Flute Spacing & Helix Design<br>抗震系列 - 不等分割、不等螺旋刀型設計 |   |            |             |             |               |   |   |   |   |   |                        |                       |                               |                         |                       |         |              |                              |
| Square<br>平刀   | Square Type<br>Medium Flute<br>1.5倍刃長不等<br>立銑刀            | PVEM       | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   | ○                      |                       |                               |                         |                       | 111     | 374-379      |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 111          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 111          | 374-379                      |
|  | Square Type<br>Long Flute<br>3倍刃長不等立銑刀                    | PVEL       | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ○                     |                               |                         |                       | 111     | 374-379      |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 111          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 111          | 374-379                      |
|  | Square Type<br>Heavy Duty<br>不等立銑刀<br>高速重切                | PVEC       | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ○                     |                               |                         |                       | 112     | 374-379      |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 112          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 112          | 374-379                      |
| Ball Nose<br>球刀  | Ball Nose Type<br>不等球型立銑刀                                 | PVB        | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ○                     |                               |                         | 113                   | 374-379 |              |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 113          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 113          | 374-379                      |
|  | Ball Nose Type<br>Long Flute & Neck<br>不等球型立銑刀<br>長刃 & 有效 | PVBSX      | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ○                     |                               |                         |                       | 113     | 374-379      |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 113          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 113          | 374-379                      |
| Corner<br>Radius<br>圓鼻刀  | Corner Radius<br>Type<br>不等圓鼻立銑刀                          | PVR        | 4           |             | ALTIBN        | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ○                     |                               |                         | 114                   | 374-379 |              |                              |
|  |   |            |             |             | nACRo         | ◎                                       | ◎   | ◎   | ○   | ○   |                        | ○                     |                               |                         |                       |         | 114          | 374-379                      |
|  |   |            |             |             | ZrN-S         | ◎                                       | ◎   | ◎   | ◎   | ○   |                        | ◎                     | ◎                             | ★                       | ○                     | ○       | 114          | 374-379                      |

| End Shape<br>刃端形狀   | Type<br>刀型                                      | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                   |                                |                                 |                                 |                                 |                                 |                 |                | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                      |              |
|---|---|------------|-------------|-------------|---------------|-----------------|----------------|----------|-------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------|----------------|--------------|------------------------------|----------------------|--------------|
|   |   |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | Carbon steel / 碳鋼 | Pre-hardened steel under 45HRC | High-hardened steel under 50HRC | High-hardened steel under 55HRC | High-hardened steel under 60HRC | High-hardened steel under 65HRC | Stainless steel | Titanium alloy |              |                              | Nickel/Inconel alloy | Copper alloy |
| 200 PLUS Series - Unequal Flute Spacing & Unequal Leads Design for High Hardness Exotic Materials<br>難切削材高效刀具系列 - 不等分割、不等導程設計 |   |            |             |             |               |                 |                |          |                   |                                |                                 |                                 |                                 |                                 |                 |                |              |                              |                      |              |
| Square<br>平刀  | Miniature Square Type<br>微小徑立銼刀                 | P-SFUMIE   | 2           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                | 118          | 380                          |                      |              |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              | 118                          | 380                  |              |
|   | Square Type<br>立銼刀                              | P-SFUET    | 2           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              | 120                          | 381                  |              |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              | 120                          | 381                  |              |
|   |   |            | 4           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              |                              | 121                  | 381          |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              |                              | 121                  | 381          |
|   | Long Flute Square Type<br>長刃立銼刀                 | P-SFULET   | 2           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              | 122                          | 383                  |              |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              |                              | 122                  | 383          |
|   |   |            | 4           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              |                              | 123                  | 384          |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              |                              | 123                  | 384          |
|   | Multiple Flutes Square Type<br>多刃立銼刀            | P-SFUVT    | 6           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              | 124                          | 385                  |              |
|   |   |            | 8           |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              | 124                          | 385                  |              |
|   | Multiple Flutes Long Flute Square Type<br>長刃立銼刀 | P-SFULVT   | 6           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                |              | 125                          | 385                  |              |
|   |   |            | 8           |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              | 125                          | 385                  |              |
| Long Neck Square Type<br>深溝長頸立銼刀  | P-SFULNT  | 2          |             | TISIN+      | ○             | ○               | ○              | ◎        | ◎                 | ◎                              |                                 |                                 |                                 |                                 |                 |                | 126          | 361,386                      |                      |              |
|   |   | 4          |             | P-nACo      | ○             | ○               | ○              | ◎        | ◎                 | ★                              |                                 |                                 |                                 |                                 |                 |                | 126          | 361,386                      |                      |              |
| Ball Nose<br>球刀   | Miniature Ball Nose Type<br>微小徑球型立銼刀            | P-SFUMB    | 2           |             | TISIN+        | ○               | ○              | ○        | ◎                 | ◎                              | ◎                               |                                 |                                 |                                 |                 |                | 128          | 387                          |                      |              |
|   |   |            |             |             | P-nACo        | ○               | ○              | ○        | ◎                 | ◎                              | ★                               |                                 |                                 |                                 |                 |                |              | 128                          | 387                  |              |

| End Shape<br>刃端形狀 | Type<br>刀型 | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |  |   |  |  |  |  |                        |                       |                              | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
|-------------------|------------|------------|-------------|-------------|---------------|-----------------|----------------|----------|--|---|--|--|--|--|------------------------|-----------------------|------------------------------|--------------|------------------------------|
|                   |            |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | 碳鋼 / 合金鋼<br>Carbon steel / Alloy steel | 預硬鋼 45 HRC 以下<br>Pre-hardened steel under 45HRC | 硬質鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 硬質鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 硬質鋼 60 HRC 以下<br>High-hardened steel under 60HRC | 硬質鋼 65 HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳基合金<br>Nickel/Inconel alloy |              |                              |

200 PLUS Series - Unequal Flute Spacing & Unequal Leads Design for High Hardness Exotic Materials  
難切削材高效刀具系列 - 不等分割、不等導程設計

|   |  |                                |          |   |   |        |   |   |   |   |   |   |  |  |  |  |  |  |     |     |         |         |
|---|--|--------------------------------|----------|---|---|--------|---|---|---|---|---|---|--|--|--|--|--|--|-----|-----|---------|---------|
| Ball Nose<br>球刀   | Ball Nose Type<br>球型立銼刀                          | P-SFUBT                        | 2        |    | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  | 130 | 388 |         |         |
|   |  |                                |          |    | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 130     | 388     |
|   | Ball Nose Type<br>球型立銼刀                          | P-SFUBT                        | 4        |    | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     | 131 | 388     |         |
|   |  |                                |          |   | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 131     | 388     |
|   | Power Short Flute<br>Ball Nose Type<br>強力短刃球型立銼刀 | P-SFUBTSX                      | 2        |  | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     | 132 | 389     |         |
|   |  |                                |          |  | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 132     | 389     |
|   | Long Shank Ball<br>Nose Type<br>長柄球型立銼刀          | P-SFULBT                       | 2        |  | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     | 133 | 389     |         |
|   |  |                                |          |  | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 133     | 389     |
|   | Long Neck Ball<br>Nose Type<br>深溝長頸球型立銼刀         | P-SFULNBT                      | 2        |  | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     | 134 | 366-367 |         |
|   |  |                                |          |  | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 134     | 366-367 |
|   | Corner<br>Radius<br>圓鼻刀                          | Corner Radius<br>Type<br>圓鼻立銼刀 | P-SFURTA | 4   |  | TiSiN+ | ○ | ○ | ○ | ◎ | ◎ | ◎ |  |  |  |  |  |  |     | 136 | 390     |         |
|   |  |                                |          |   |  | P-nAco | ○ | ○ | ○ | ◎ | ◎ | ★ |  |  |  |  |  |  |     |     | 136     | 390     |
| Long Neck &<br>Shank Corner<br>Radius Type<br>長頸長柄<br>圓鼻立銼刀 |  | P-SFUCRM                       | 2        |  | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     | 137 | 391     |         |
|   |  |                                |          |  | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     | 137 | 391     |         |
|   |  |                                | 4        |  | TiSiN+  | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  |     |     | 138     | 392     |
|   |  |                                |          |  | P-nAco  | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     |     | 138     | 392     |

| End Shape<br>刃端形狀 | Type<br>刀型 | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                   |                                |                                |                                 |                                 |                                 |                 |                |                      | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
|-------------------|------------|------------|-------------|-------------|---------------|-----------------|----------------|----------|-------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------|----------------|----------------------|--------------|------------------------------|
|                   |            |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | Carbon steel / 碳鋼 | Pre-hardened steel under 45HRC | Pre-hardened steel under 50HRC | High-hardened steel under 55HRC | High-hardened steel under 60HRC | High-hardened steel under 65HRC | Stainless steel | Titanium alloy | Nickel/Inconel alloy |              |                              |

200 PLUS Series - Unequal Flute Spacing & Unequal Leads Design for High Hardness Exotic Materials  
難切削材高效刀具系列 - 不等分割、不等導程設計

|  |   |          |   |        |        |   |   |   |   |   |   |  |  |  |  |  |  |     |     |     |     |
|--|---|----------|---|--------|--------|---|---|---|---|---|---|--|--|--|--|--|--|-----|-----|-----|-----|
| Corner Radius<br>圓鼻刀                         | Pencil Neck<br>Corner Radius<br>Type<br>斜頸圓鼻立銼刀             | P-SFUCRS | 2 |        | TiSiN+ | ○ | ○ | ○ | ◎ | ◎ | ◎ |  |  |  |  |  |  | 139 | 393 |     |     |
|  |   |          |   |        | P-nACo | ○ | ○ | ○ | ◎ | ◎ | ★ |  |  |  |  |  |  |     |     | 139 | 393 |
|  |   |          | 4 |        | TiSiN+ | ○ | ○ | ○ | ◎ | ◎ | ◎ |  |  |  |  |  |  |     |     | 141 | 394 |
|  |   |          |   |        | P-nACo | ○ | ○ | ○ | ◎ | ◎ | ★ |  |  |  |  |  |  |     |     |     | 141 |
| Long Neck Corner<br>Radius Type<br>深溝長頸圓鼻立銼刀 | P-SFUCL   | 2        |   | TiSiN+ | ○      | ○ | ○ | ◎ | ◎ | ◎ |   |  |  |  |  |  |  | 143 | 395 |     |     |
|  |   |          |   | P-nACo | ○      | ○ | ○ | ◎ | ◎ | ★ |   |  |  |  |  |  |  |     | 143 | 395 |     |
| Ball<br>Nose<br>球刀                           | 3 Different Flutes<br>Ball Nose Type<br>3刃不等分割球型<br>立銼刀     | DAB      | 3 |        | TiSiN+ | ○ | ○ | ○ | ◎ | ◎ | ◎ |  |  |  |  |  |  | 150 | 396 |     |     |
|  |   |          |   |        | P-nACo | ○ | ○ | ○ | ◎ | ◎ | ★ |  |  |  |  |  |  |     |     | 150 | 396 |
| Corner<br>Radius<br>圓鼻刀                      | 3 Different Flutes<br>Corner Radius Type<br>3刃不等分割圓鼻<br>立銼刀 | DAC      | 3 |        | TiSiN+ | ○ | ○ | ○ | ◎ | ◎ | ◎ |  |  |  |  |  |  | 151 | 397 |     |     |
|  |   |          |   |        | P-nACo | ○ | ○ | ○ | ◎ | ◎ | ★ |  |  |  |  |  |  |     |     | 151 | 397 |

Non-Ferrous Series 非鐵用系列  
General Series for Non-Ferrous 銅鋁合金專用刀

|              |  |     |   |   |    |    |  |  |  |  |  |  |  |  |  |  |   |     |     |     |         |     |     |
|--------------|--|-----|---|---|----|----|--|--|--|--|--|--|--|--|--|--|---|-----|-----|-----|---------|-----|-----|
| Square<br>平刀 | Square Type-For<br>Wood & Plastic<br>塑膠、木工用<br>立銼刀 | AP  | 1 |   | TB |    |  |  |  |  |  |  |  |  |  |  |   | 154 | 398 |     |         |     |     |
|              |  |     |   |   | TB |    |  |  |  |  |  |  |  |  |  |  |   |     |     | 155 | 398     |     |     |
|              | Square Type<br>For Copper &<br>Aluminum<br>銅鋁合金立銼刀 | AE5 | 2 | 2 |    |    |  |  |  |  |  |  |  |  |  |  | ○ | ◎   | 156 | 399 |         |     |     |
|              |  |     |   |   |    |    |  |  |  |  |  |  |  |  |  |  |   | ○   | ◎   | 156 | 400-401 |     |     |
|              |  |     |   |   |    | TB |  |  |  |  |  |  |  |  |  |  |   |     | ○   | ◎   | 157     | 399 |     |
|              |  | AE5 | 3 | 3 | 3  |    |  |  |  |  |  |  |  |  |  |  |   | ○   | ◎   | 157 | 400-401 |     |     |
|              |  |     |   |   |    |    |  |  |  |  |  |  |  |  |  |  |   |     |     | ○   | ◎       | 158 | 402 |
|              |  |     |   |   |    |    |  |  |  |  |  |  |  |  |  |  |   |     |     | ○   | ◎       | 158 | 403 |











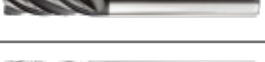


| End Shape<br>刃端形狀  | Type<br>刀型   | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |                     |                       |         |
|--|--|------------|-------------|-------------|---------------|---------------------------------------|--------------------|---------------------------|----------------------|----------------------|----------------------|----------------------|----------------------|------------------------|-----------------------|------------------------------|--------------|------------------------------|---------------------|-----------------------|---------|
|  |  |            |             |             |               | ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳 |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              |                     |                       |         |
|  |  |            |             |             |               | 碳鋼<br>Carbon steel                    | 合金鋼<br>Alloy steel | 預硬鋼<br>Pre-hardened steel | 45HRC<br>under 45HRC | 50HRC<br>under 50HRC | 55HRC<br>under 55HRC | 60HRC<br>under 60HRC | 65HRC<br>under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy |              |                              | 銅合金<br>Copper alloy | 鋁合金<br>Aluminum alloy |         |
| Non-Ferrous Series 非鐵用系列<br>General Series for Non-Ferrous 銅鋁合金專用刀 |  |            |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              |                     |                       |         |
| Square<br>平刀   | Square Type<br>For Copper &<br>Aluminum<br>銅鋁合金立銑刀   | AE5        | ③           |             | TB            |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              | ○ ◎          | 159                          | 402                 |                       |         |
|  |  | AEL5       |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              | ○ ◎                 | 159                   | 403     |
|  | Specular Square<br>For Aluminum<br>Type<br>全鏡面鋁用立銑刀  | AET        | ②           |             | TB            |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ○ ◎                          | 160                 | 399                   |         |
|  |  |            | ③           |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ○ ◎                          | 161                 | 399                   |         |
|  |  | ③          |             | TB          |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ○ ◎                          | 162                 | 402                   |         |
|  |  |            |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ○ ◎                          | 163                 | 402                   |         |
|  |  | ALET       | ②           |             | TB            |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              | ○ ◎                 | 164                   | 400-401 |
|  |  |            | ③           |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              | ○ ◎                 | 165                   | 403     |
|  | Roughing Type<br>For Copper &<br>Aluminum<br>銅鋁合金粗銑刀 | ANT        | ③           |             | TB            |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ○ ◎                          | 166                 | 404                   |         |
|  |  |            |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              | ○ ◎                 | 167                   | 404     |
|  | Square Type<br>For Copper<br>銅合金立銑刀                  | CE         | ②           |             | TB            |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ◎ ○                          | 168                 | 405                   |         |
|  |  |            |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              |                              | ◎ ◎                 | 169                   | 405     |
| CEL  |  |            | TB          |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       | ◎ ◎                          | 170          | 406                          |                     |                       |         |
| Ball Nose<br>球刀  | ACB  | ②          |             | TB          |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              | ◎ ◎          | 171                          | 347-348             |                       |         |
|  |  |            |             |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       |                              |              | ◎ ◎                          | 172                 | 347-348               |         |
|  | ACBL   |            | TB          |             |               |                                       |                    |                           |                      |                      |                      |                      |                      |                        |                       | ◎ ◎                          | 173          | 407                          |                     |                       |         |





| End Shape<br>刃端形狀                                      | Type<br>刀型  | Mode<br>型號     | Flute<br>刃數    | Shape<br>圖樣 | Coating<br>塗層 | Work Piece<br>被切削材                          | Application<br>應用範圍                          | Spec.<br>規格表                                    | Cutting<br>Condition<br>切削條件                    |   |   |                        |                              |                                 |                         |                       |     |
|--|---|----------------|----------------|-------------|---------------|---|--|---|---|---|---|------------------------|------------------------------|---------------------------------|-------------------------|-----------------------|-----|
| Titanium Nickel / Inconel Alloy 鈦利酶系列                  |   |                |                |             |               |   |  |   |   |   |   |                        |                              |                                 |                         |                       |     |
| Square<br>平刀   | Square Type For<br>Exotic Materials<br>難切削材專用精銑刀          | PVE1TF         | 4              |             | Zr-N          | Titanium<br>鈦合金                             |  | 190   | 418   |   |   |                        |                              |                                 |                         |                       |     |
| Corner<br>Radius<br>圓鼻刀                                | Corner Radius Type<br>For Exotic Materials<br>難切削材專用圓鼻立銑刀 | PVR1T          | 4              |             | Zr-N          | Titanium<br>鈦合金                             |  | 191   | 418   |   |   |                        |                              |                                 |                         |                       |     |
| End Shape<br>刃端形狀                                      | Type<br>刀型  | Mode<br>型號     | Flute<br>刃數    | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材                             |  |   |   |   |   | Spec.<br>規格表           | Cutting<br>Condition<br>切削條件 |                                 |                         |                       |     |
|  |   |                |                |             |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |  |   |   |   |   |                        |                              |                                 |                         |                       |     |
|  |   |                |                |             |               | 碳鋼 / 合金鋼<br>Carbon steel / Alloy steel      | 預硬鋼 5-HRC 以下<br>Pre-harden steel under 45HRC | 高硬鋼 5-HRC 以下<br>High-hardened steel under 50HRC | 高硬鋼 5-HRC 以下<br>High-hardened steel under 55HRC | 高硬鋼 6-HRC 以下<br>High-hardened steel under 60HRC | 高硬鋼 6-HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy        | 鈦鎳/鈦鎳合金<br>Nickel/Inconel alloy | 銅合金 / 銅<br>Copper alloy | 鋁合金<br>Aluminum alloy |     |
| Functional Series 功能性系列<br>RS Series - Anti-wear 超潤滑系列 |   |                |                |             |               |   |  |   |   |   |   |                        |                              |                                 |                         |                       |     |
| Square<br>平刀   | Miniature<br>Square Type<br>微小徑立銑刀                        | SUMIE          | 2              |             | RS            | ◎   | ◎  | ○   | ○   | ◎   |   |                        |                              |                                 | 194                     | 332                   |     |
|  | Square Type<br>立銑刀  | SUPE           | 2              |             | RS            | ◎   | ◎  | ◎   | ○   | ◎   |   |                        |                              |                                 | 195                     | 332                   |     |
|  |   |                | 3              |             | RS            | ◎   | ◎  | ○   | ○   | ◎   |   |                        |                              |                                 | 196                     | 419                   |     |
|  |   |                | 4              |             | RS            | ◎   | ◎  | ◎   | ○   | ◎   |   |                        |                              |                                 | 198                     | 336-337               |     |
|  | Long Flute<br>Square Type<br>長刃立銑刀                        | SULET<br>(35°) | SULPE<br>(45°) | 4           |               | RS  | ◎  | ◎   | ◎   | ○   | ◎   |                        |                              |                                 |                         | 199                   | 420 |
|  |   |                |                | 2           |               | RS  | ◎  | ◎   | ◎   | ○   | ◎   |                        |                              |                                 |                         | 200                   | 358 |
|  |   |                |                | 4           |               | RS  | ◎  | ◎   | ◎   | ○   | ◎   |                        |                              |                                 |                         | 201                   | 359 |
| Long Neck<br>Square Type<br>深溝長頸立銑刀                    | SULNT   | 2              |                | RS          | ◎             | ◎   | ◎  | ○   | ◎   |   |   |                        |                              | 202                             | 406                     |                       |     |









| End Shape<br>刃端形狀  | Type<br>刀型                              | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                           |               |                              |               |                                 |                                 |               |                                 | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |         |                |
|--|---|------------|-------------|-------------|---------------|-----------------|----------------|----------|---------------------------|---------------|------------------------------|---------------|---------------------------------|---------------------------------|---------------|---------------------------------|--------------|------------------------------|---------|----------------|
|  |   |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | Carbon steel, Alloy steel | 預硬鋼 55 HRC 以下 | Pre-harden steel under 45HRC | 高硬鋼 55 HRC 以下 | High-hardened steel under 55HRC | High-hardened steel under 60HRC | 高硬鋼 60 HRC 以下 | High-hardened steel under 65HRC |              |                              | 不銹鋼     | Titanium alloy |
| Functional Series 功能性系列<br>RS Series - Anti-wear 超潤滑系列         |   |            |             |             |               |                 |                |          |                           |               |                              |               |                                 |                                 |               |                                 |              |                              |         |                |
| Square<br>平刀   | Fine Pitch<br>Roughing Type<br>粗精立銼刀    | SUNTA      | 3           |             | RS            | ◎               | ◎              | ○        | ○                         | ○             | ◎                            |               |                                 |                                 |               | ○                               | ○            | 204                          | 342     |                |
|  |   |            | 4           |             | RS            | ◎               | ◎              | ○        | ○                         |               | ◎                            |               |                                 |                                 |               | ○                               | ○            | 205                          | 343     |                |
|  | Roughing Type<br>粗銼刀                    | SUXTA      | 3           |             | RS            | ◎               | ◎              | ○        | ○                         | ◎             |                              |               |                                 |                                 |               | ○                               | ○            | 206                          | 344     |                |
|  |   |            | 4           |             | RS            | ◎               | ◎              | ○        | ○                         |               | ◎                            |               |                                 |                                 |               | ○                               | ○            | 207                          | 345     |                |
| Ball<br>Nose<br>球刀   | Miniature Ball<br>Nose Type<br>微小徑球型立銼刀 | SUMIB      | 2           |             | RS            | ◎               | ◎              | ◎        | ○                         |               | ◎                            |               |                                 |                                 | ○             | ○                               | 208          | 347-348                      |         |                |
|  | Ball Nose Type<br>球型立銼刀                 | SUBT       | 2           |             | RS            | ◎               | ◎              | ◎        | ○                         |               | ◎                            |               |                                 |                                 | ○             | ○                               | 209          | 347-348                      |         |                |
|  |   |            | 4           |             | RS            | ◎               | ◎              | ◎        | ○                         |               | ◎                            |               |                                 |                                 | ○             | ○                               | 210          | 421                          |         |                |
|  | Long Shank Ball<br>Nose Type<br>長柄球型立銼刀 | SULBT      | 2           |             | RS            | ◎               | ◎              | ◎        | ○                         |               | ◎                            |               |                                 |                                 | ○             | ○                               | 211          | 347-348                      |         |                |
| Long Neck Ball<br>Nose Type<br>深溝長頸球型立銼刀                       | SULNBT                                  | 2          |             | RS          | ◎             | ◎               | ◎              | ○        |                           | ◎             |                              |               |                                 | ○                               | ○             | 212                             | 407          |                              |         |                |
| Corner<br>Radius<br>圓鼻刀  | Corner Radius<br>Type<br>圓鼻立銼刀          | SURTA      | 3           |             | RS            | ◎               | ◎              | ◎        | ○                         |               | ◎                            |               |                                 |                                 | ○             | ○                               | 214          | 422                          |         |                |
| Functional Series 功能性系列<br>FHP Series - Heavy Duty 強力高速重切削銼刀系列 |   |            |             |             |               |                 |                |          |                           |               |                              |               |                                 |                                 |               |                                 |              |                              |         |                |
| Square<br>平刀   | Short Flute<br>Square Type<br>短刃立銼刀     | FHPS       | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ○                         | ○             |                              |               |                                 |                                 |               |                                 | 218          | 423-424                      |         |                |
|  | Square Type<br>立銼刀                      | FHP        |             |             | ALTIBN        | ◎               | ◎              | ◎        | ○                         | ○             |                              |               |                                 |                                 |               |                                 |              | 221                          | 423-424 |                |
|  | Long Flute<br>Square Type<br>長刃立銼刀      | FHPM       |             |             | ALTIBN        | ◎               | ◎              | ◎        | ○                         | ○             |                              |               |                                 |                                 |               |                                 |              |                              | 222     | 423-424        |
|  |   | FHPL       |             |             | ALTIBN        | ◎               | ◎              | ◎        | ○                         | ○             |                              |               |                                 |                                 |               |                                 |              |                              | 222     | 423-424        |
| Corner<br>Radius<br>圓鼻刀  | Corner Radius<br>Type<br>圓鼻立銼刀          | CRFHP      | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ○                         | ○             |                              |               |                                 |                                 |               |                                 | 223          | 423-424                      |         |                |

| End Shape<br>刃端形狀   | Type<br>刀型                             | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材                             |   |   |   |   |   |                        |                       |                              |                     |                           |                     |              | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |     |
|---|--|------------|-------------|---|---------------|---|---|---|---|---|---|------------------------|-----------------------|------------------------------|---------------------|---------------------------|---------------------|--------------|--------------|------------------------------|-----|
|   |  |            |             |   |               | ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳 |   |   |   |   |   |                        |                       |                              |                     |                           |                     |              |              |                              |     |
|   |  |            |             |   |               | 碳鋼 / 合金鋼<br>Carbon steel, Alloy steel       | 預硬鋼 / 合金鋼<br>Pre-hardened steel under 45HRC | 硬鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 硬鋼 55 HRC 以下<br>High-hardened steel under 55HRC | 硬鋼 60 HRC 以下<br>High-hardened steel under 60HRC | 硬鋼 65 HRC 以下<br>High-hardened steel under 65HRC | 不銹鋼<br>Stainless steel | 鈦合金<br>Titanium alloy | 鎳鉻合金<br>Nickel/Inconel alloy | 銅合金<br>Copper alloy | 鋁合金 / 鎂<br>Aluminum alloy | 鈷合金<br>Cobalt alloy | 其他<br>Others |              |                              |     |
| <b>Functional Series 功能性系列</b><br>FHP+ Series - Heavy Duty Plus 高速重切削粗精銑刀系列                                 |  |            |             |   |               |   |   |   |   |   |   |                        |                       |                              |                     |                           |                     |              |              |                              |     |
| Square<br>平刀  | Square Type<br>立銑刀                     | FHPC       | 4           |    | nACRo         | ◎   | ◎   | ◎   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | 226          | 425          |                              |     |
|   | Long Flute<br>Square Type<br>長刃立銑刀     | FHPMC      |             | nACRo   | ◎             | ◎   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | 226          | 425                          |     |
|   |  | FHPLC      |             | nACRo   | ◎             | ◎   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 226                          | 425 |
| Corner<br>Radius<br>圓鼻刀   | Corner Radius<br>Type<br>圓鼻立銑刀         | CRFHPC     | 4           |   | nACRo         | ◎   | ◎   | ◎   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | 227          | 425          |                              |     |
| <b>Functional Series 功能性系列</b><br>HPSS Series - High Speed Plugging + Slotting + Side milling 插溝側三合一重切削銑刀系列 |  |            |             |   |               |   |   |   |   |   |   |                        |                       |                              |                     |                           |                     |              |              |                              |     |
| Square<br>平刀  | Square Type<br>立銑刀                     | HPSS       | 3           |  | SS            | ◎   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | 231          | 426          |                              |     |
| <b>Functional Series 功能性系列</b><br>KK Series - Multi Flutes High Efficiency 多刃高效立銑刀                          |  |            |             |   |               |   |   |   |   |   |   |                        |                       |                              |                     |                           |                     |              |              |                              |     |
| Square<br>平刀  | Roughing &<br>Finishing Type<br>粗精銑立銑刀 | KKH        | 2           |  | P-nACo        | ○   | ○   | ◎   | ◎   | ◎   | ◎   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | 234          | 427          |                              |     |
|   |  |            | 3           |  | P-nACo        | ○   | ○   | ◎   | ◎   | ◎   | ◎   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | 234          | 427                          |     |
|   |  |            | 4           |  | P-nACo        | ○   | ○   | ◎   | ◎   | ◎   | ◎   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 234                          | 427 |
|   |  | KKM        | 2           |  | TiSiN         | ○   | ○   | ◎   | ◎   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 235                          | 428 |
|   |  |            | 3           |  | TiSiN         | ○   | ○   | ◎   | ◎   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 235                          | 428 |
|   |  |            | 4           |  | TiSiN         | ○   | ○   | ◎   | ◎   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 235                          | 428 |
|   |  | KKF        | 2           |  | nACRo         | ○   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 236                          | 429 |
|   |  |            | 3           |  | nACRo         | ○   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 236                          | 429 |
|   |  | KKR        | 2           |  | nACRo         | ○   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 237                          | 430 |
|   |  |            | 3           |  | nACRo         | ○   | ◎   | ○   | ○   | ○   | ○   | ○                      | ○                     | ○                            | ○                   | ○                         | ○                   | ○            | ○            | 237                          | 430 |

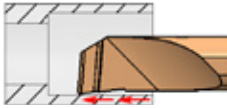
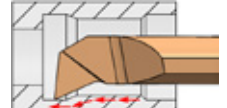
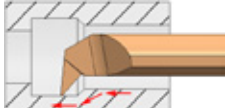
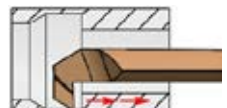






| End Shape<br>刃端形狀  | Type<br>刀型                               | Mode<br>型號 | Flute<br>刃數 | Shape<br>圖樣 | Coating<br>塗層 | Work Piece 被切削材 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
|--|--|------------|-------------|-------------|---------------|-----------------|----------------|----------|-------------------|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|---------------------|--------------------|---------------------------|--------------|------------------------------|
|  |  |            |             |             |               | ★ Perfect 最推薦   | ◎ Excellent 適合 | ○ Good 佳 | Carbon steel / 碳鋼 | Pre-hardened steel under 45HRC | Pre-hardened steel under 50HRC | High-hardened steel under 55HRC | High-hardened steel under 60HRC | High-hardened steel under 65HRC | Stainless steel 不銹鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 |              |                              |
| <b>Functional Series 功能性系列</b><br>SH Series - Super High Hardness & Super High Speed Cutting 超高硬度 & 超高速加工系列  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Ball Nose<br>球刀  | Ball Nose Type<br>超高硬度/超高速球刀             | KTG        | 2           |             | SH            | ○               | ○              | ◎        | ◎                 | ◎                              | ★                              |                                 |                                 |                                 |                     |                    | 240                       | 431          |                              |
| Corner Radius<br>圓鼻刀   | Corner Radius Type<br>超高硬度/超高速圓鼻刀        | KCR        | 4           |             | SH            | ○               | ○              | ◎        | ◎                 | ◎                              | ★                              |                                 |                                 |                                 |                     |                    | 241                       | 432          |                              |
| <b>Functional Series 功能性系列</b><br>Big Foot Series - Double Removal Rate 高移除率球刀系列   |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Ball Nose<br>球刀  | Ball Nose Type<br>高移除率球刀                 | BFR        | 2           |             | SH            | ○               | ○              | ◎        | ◎                 | ◎                              | ★                              |                                 |                                 |                                 |                     |                    | 245                       | 433          |                              |
| <b>Functional Series 功能性系列</b><br>SUS Series - Stainless Steel Expert 不銹鋼專用系列  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Square<br>平刀   | Square Type<br>不銹鋼專用立銼刀                  | SUS        | 4           |             | SSA           | ○               | ○              |          |                   |                                |                                | ◎                               |                                 |                                 |                     |                    | 247                       | 336-337      |                              |
|  | Long Flute Square Type<br>不銹鋼專用長刃立銼刀     | SUSL       |             |             | SSA           | ○               | ○              |          |                   |                                |                                |                                 | ◎                               |                                 |                     |                    |                           | 247          | 359                          |
| <b>Functional Series 功能性系列</b><br>Multi-function Series CDM 多功能銼刀  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Multi-function<br>多功能  | Multi-function Type<br>多功能立銼刀            | CDM        | 2           |             | ALTIBN        | ○               | ◎              | ◎        | ○                 |                                |                                |                                 | ○                               |                                 |                     |                    | 248                       | 434          |                              |
| <b>Frictional - Carbide End Mills 英制- 鎢鋼立銼刀</b>  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| <b>General Series 泛用系列</b><br>600 Nano Series 600 奈米系列   |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Square<br>平刀   | Square Type<br>立銼刀                       | ISE        | 2           |             | ALTIBN        | ◎               | ◎              | ◎        | ○                 |                                |                                |                                 | ○                               |                                 |                     |                    | 250                       | 435-440      |                              |
|  |  |            | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ○                 |                                |                                |                                 |                                 | ○                               |                     |                    |                           |              | 251                          |
| Ball Nose<br>球刀  | Ball Nose Type<br>球型立銼刀                  | ISB        | 2           |             | ALTIBN        | ◎               | ◎              | ◎        | ○                 |                                |                                |                                 | ○                               |                                 |                     |                    | 252                       |              |                              |
| <b>Non-Ferrous Series 非鐵用系列</b><br>High Speed Series for Non-Ferrous 超高速鋁用刀  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Square<br>平刀   | Square Type<br>2刃鋁合金專用立銼刀                | IAE5       | 2           |             | ZrN           |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     | ○                  | ◎                         | 253          | 441                          |
|  | High Feed U-Type<br>Aluminum<br>超高速鋁用立銼刀 | IAUE       | 3           |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     | ◎                  | ★                         | 254          | 441                          |
| <b>400 PLUS Series 400 PLUS 系列</b><br>Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計  |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Square<br>平刀   | Square Type<br>立銼刀                       | IPVE       | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ◎                 |                                |                                |                                 |                                 |                                 |                     |                    | 255                       | 442-447      |                              |
| <b>400 PLUS Series 400 PLUS 系列</b><br>400 PLUS Series - Unequal Flute Spacing & Helix Design<br>High Performance for Exotic Materials 難切削材高效刀具系列 - 不等分割、不等螺旋刀型設計 |  |            |             |             |               |                 |                |          |                   |                                |                                |                                 |                                 |                                 |                     |                    |                           |              |                              |
| Corner Radius<br>圓鼻刀   | Corner Radius Type<br>圓鼻立銼刀              | IPVR1T     | 4           |             | ALTIBN        | ◎               | ◎              | ◎        | ◎                 |                                |                                |                                 | ○                               | ◎                               | ○                   |                    | 256                       | 448          |                              |

| High Efficient Cutting System 燒結系統  |   |   |  |   |
|---|---|---|--|---|
| 3.5KW Induction Machine and Water Cooling Station<br>3.5KW電磁感應加熱水冷機組                | Dual End Carbide Anti-Vibration Shrink Fit Extension & Adapter<br>雙頭龍鎢鋼抗震延長桿 & 雙頭龍轉接座 |   |  | Fixture of Heating<br>燒結加熱治具  |
| ST-3500 P.259   | P.265 & 266   |   |  | P.267   |
|    |      |    |    |    |
| Replaceable End Mills Head 可替換刀頭立銼刀   |   |   |  |   |
| BALL NOSE TIP 球型刀頭  |   | CORNER RADIUS TIP 圓鼻刀頭  |  |   |
| 2刃 - 2FLUTES  | 4刃 - 4FLUTES  | 2刃 - 2FLUTES  | 4刃 - 4FLUTES   |   |
| SBS P.269   | SBS P.269   | RTAS P.270  | RTAS P.270   |   |
|   |     |   |  |   |
| Cutting Condition 切削條件 347-348  | Cutting Condition 切削條件 449  | Cutting Condition 切削條件 450  | Cutting Condition 切削條件 451   |   |
| SQUARE TIP 平刀頭  |   | FOR ALUMINUM 鋁用平刀頭  |  |   |
| 2刃 - 2FLUTES  | 4刃 - 4FLUTES  | 3刃 - 3FLUTES  | 2刃 - 2FLUTES   | 3刃 - 3FLUTES  |
| SES P.271   | SES P.271   | PES P.272   | AES5 P.273   | AES5 P.273  |
|  |    |  |  |  |
| Cutting Condition 切削條件 452  | Cutting Condition 切削條件 452  | Cutting Condition 切削條件 453  | Cutting Condition 切削條件 454   | Cutting Condition 切削條件 455  |
| FUNCTIONAL TYPE 功能性銼刀頭  |   |   |  |   |
| Heavy-duty 重切削平刀頭   | Super High Speed/ Hardness Ball Nose 超高速/超高硬度球刀頭                                      | Super High Speed/ Hardness Corner Radius 超高速/超高硬度圓鼻刀頭                               | Dovetail Cutter 鳩尾刀  | Position Chamfer Cutter 定位倒角刀   |
| FHPCS P.274   | KTGS P.275  | KCRS P.276  | TAMS P.277   | PDSTS P.278   |
|  |    |  |  |  |
| Cutting Condition 切削條件 456-457  | Cutting Condition 切削條件 458-460  | Cutting Condition 切削條件 461-462  |  | Cutting Condition 切削條件 467  |
| Corner Rounding Cutter 外R刀  | Double Chamfer Cutter 雙面倒角刀   | Keyseat Cutter 鍵槽刀  | Keyseat Cutter - Full Radius T型R刀  | 220° Ball Nose Tip 220° 球刀  |
| RCS P.279   | TMAS P.280  | TMTS P.281  | TMRS P.282   | TRSS P.283  |
|  |    |  |  |  |

| Insert & Insert Holder<br>刀片&刀片刀桿   |                           |  |  |   |
|---|---------------------------|--|--|---|
| INDEXABLE RADIUS INSERT<br>RD 可轉位式圓鼻銑刀片   |                           | RD ACCESSORIES RD配件  |  |   |
| RDEW<br>RDEX  | For Aluminum<br>RDHX (鋁用) | RD Shrink Fit Head<br>RD捨棄式燒結刀頭  | Radius End Mill Holder<br>RD捨棄式整體刀柄  | Radius End Mill Holder<br>RD捨棄式整體刀柄   |
| P.288   | P.288                     | P.289  | P.290  | P.291   |
|  <p>Cutting Condition 切削條件 463</p>   |                           |  <p>Patent Indexable Shrink Fit Head<br/>TW Nr. M512454<br/>Cn Nr. 201520721653.9<br/>專利捨棄式刀頭</p>   |   |  |
| BALL NOSE INSERT WR 捨棄式球刀片  |                           | WR ACCESSORIES WR配件  |  |   |
| WRHS  |                           | WR Shrink Fit Head<br>WR捨棄式燒結刀頭  | Ball-Nose End Mill Holder<br>WR捨棄式整體刀柄   |   |
| P.295   |                           | P.296  | P.297  |   |
|  <p>Cutting Condition 切削條件 464</p>  |                           |  <p>Patent Indexable Shrink Fit Head<br/>TW Nr. M512454<br/>Cn Nr. 201520721653.9<br/>專利捨棄式刀頭</p>  |    |   |
| INDEXABLE HN INSERT HN 可轉位式雙面六角銑刀片  |                           | HN ACCESSORIES HN 配件   |  |   |
| HNGX  |                           | HN06 Holder<br>HN06 捨棄式整體刀柄  | HN09 Holder<br>HN09 捨棄式整體刀柄  |   |
| P.302   |                           | P.303  | P.304  |   |
|  <p>Cutting Condition 切削條件 465</p> |                           |    |   |   |
| INDEXABLE CN INSERT CN 可轉位式雙面銑刀片  |                           | CN ACCESSORIES CN 配件   |  |   |
| CNGX  |                           | CNGX07 Shrink Fit Head<br>CNGX07 捨棄式燒結刀頭   | CNGX07 Holder<br>CNGX07 捨棄式整體刀柄  |   |
| P.308   |                           | P.309  | P.309  |   |
|  <p>Cutting Condition 切削條件 466</p> |                           |  <p>Patent Indexable Shrink Fit Head<br/>TW Nr. M512454<br/>Cn Nr. 201520721653.9<br/>專利捨棄式刀頭</p> |   |   |
| INDEXABLE AP INSERT AP 可轉位式銑刀片  |                           | AP ACCESSORIES AP配件  |  |   |
| APKT / APMT   | For Aluminum APEX (鋁用)    | AP Shrink Fit Head AP捨棄式燒結刀頭   |  |   |
| P.310   | P.310                     | P.311  |  |   |
|                                    |                           |  <p>TB Coating</p>  |  <p>Patent Indexable Shrink Fit Head<br/>TW Nr. M512454<br/>Cn Nr. 201520721653.9<br/>專利捨棄式刀頭</p> |   |

| End Shape<br>刃端形狀   | Flute<br>刃數                                 | Type<br>刀型                            | Mode<br>型號   | Shape<br>圖樣   | Coating<br>塗層 | Work Piece 被切削材<br>◎Excellent 最適用 ○Good 適用 |                                |                                |                                 |                                 |                                 |                 |                |                      |              |                | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |     |
|---|---|---------------------------------------|--|---|---------------|--|--------------------------------|--------------------------------|---------------------------------|---------------------------------|---------------------------------|-----------------|----------------|----------------------|--------------|----------------|--------------|------------------------------|-----|
|   |   |                                       |  |   |               | Carbon steel, Alloy steel                  | Pre-hardened steel under 45HRC | Pre-hardened steel under 50HRC | High-hardened steel under 55HRC | High-hardened steel under 60HRC | High-hardened steel under 65HRC | Stainless steel | Titanium alloy | Nickel/Inconel alloy | Copper alloy | Aluminum alloy |              |                              |     |
|   |   |                                       |  |   |               | 不銹鋼  | 鈦合金                            | 鎳鉻合金                           | 銅合金                             | 鋁合金                             |                                 |                 |                |                      |              |                |              |                              |     |
| <b>Spot Drill / Chamfer Mill + Insert Set 定點鑽/倒角刀組</b><br>For General Steel、Carbon Steel、Non-Ferrous 一般鋼、碳素鋼、非鐵合金適用 |   |                                       |  |   |               |  |                                |                                |                                 |                                 |                                 |                 |                |                      |              |                |              |                              |     |
| 45°   | SE12 Spot Drill/<br>Chamfer Mill<br>定點鑽/倒角刀 | SE12                                  |   | SH+ZrN  | ◎             | ○  |                                |                                |                                 |                                 |                                 |                 |                |                      | ○            | ○              | 313          | 313                          |     |
| 30°   | SE12 Spot Drill/<br>Chamfer Mill<br>定點鑽/倒角刀 | SE12                                  |  | SH+ZrN  | ◎             | ○  |                                |                                |                                 |                                 |                                 |                 |                |                      | ○            | ○              | 313          | 313                          |     |
| <b>Position Drill 定位鑽</b><br>PDST series 定位鑽  |   |                                       |  |   |               |  |                                |                                |                                 |                                 |                                 |                 |                |                      |              |                |              |                              |     |
| Multi-function<br>多功能   | 2   | Position Drill<br>定位鑽                 | PDST   |  |               | ○  | ◎                              | ○                              |                                 |                                 |                                 |                 |                |                      | ○            | ○              | 314          | 467                          |     |
|   |   |                                       | PDST   |  | ZrN-A         | ○  | ◎                              | ◎                              | ○                               |                                 |                                 |                 | ○              | ○                    | ○            | ○              | ○            |                              | 315 |
|   |   | Long Shank<br>Position Drill<br>長柄定位鑽 | PDST   |  |               | ○  | ◎                              | ○                              |                                 |                                 |                                 |                 |                |                      |              | ○              | ○            | 316                          | 467 |
|   |   |                                       | PDST   |  | ZrN-A         | ○  | ◎                              | ◎                              | ○                               |                                 |                                 |                 | ○              | ○                    | ○            | ○              | ○            | 317                          |     |
| <b>Reamer 銼刀</b><br>RE & REC Series- Reamer & Carbide Edge Reamer<br>鎢鋼銼刀 / 刃部鎢鋼頭銼刀                                 |   |                                       |  |   |               |  |                                |                                |                                 |                                 |                                 |                 |                |                      |              |                |              |                              |     |
| Reamer<br>銼刀  | 6   | Carbide Reamer<br>銼刀                  | RE   |  |               | ○  | ○                              | ○                              | ○                               | ○                               | ○                               | ○               |                |                      | ○            | ○              | 318          | 468                          |     |
|   |   | Carbide Edge<br>Reamer<br>刃部鎢鋼        | REC  |  |               | ○  | ○                              | ○                              | ○                               | ○                               | ○                               | ○               |                |                      |              | ○              | ○            |                              | 319 |



| MINI SYSTEM Ultra-small turning tool<br>小徑車削工具 |   |                                      |                                     |               |              |                              |
|--|---|--------------------------------------|-------------------------------------|---------------|--------------|------------------------------|
| MODE<br>型號                                     | Type<br>類型  | Item<br>品名                           | Min. boring hole diameter<br>最小加工孔徑 | Coating<br>塗層 | Spec.<br>規格表 | Cutting<br>Condition<br>切削條件 |
| BR   |    | Boring<br>搪孔                         | Ø0.5mm~Ø8.0mm                       | TiSiN         | 322          |                              |
| PF22   |    | Profiling & Boring<br>仿形 & 搪孔        | Ø1.0mm~Ø8.0mm                       | TiSiN         | 323          |                              |
| PF47   |    | Profiling & Boring<br>仿形 & 搪孔        | Ø1.0mm~Ø8.0mm                       | TiSiN         | 324          |                              |
| BT   |   | Back Turning<br>背車削                  | Ø4.0mm~Ø8.0mm                       | TiSiN         | 325          |                              |
| IG   |  | Internal Grooving<br>內徑溝槽            | Ø4.0mm~Ø8.0mm                       | TiSiN         | 326          | 330                          |
| IGR  |  | Internal Grooving<br>Radius<br>內徑圓溝槽 | Ø4.0mm~Ø8.0mm                       | TiSiN         | 327          |                              |
| FG   |  | Face Grooving<br>端面溝槽                | Ø4.0mm~Ø8.0mm                       | TiSiN         | 328          |                              |
| FGR  |  | Face Grooving<br>Radius<br>端面圓溝槽     | Ø4.0mm~Ø6.0mm                       | TiSiN         | 328          |                              |
| CP   |  | Chamfering &<br>Profiling<br>倒角 & 仿形 | Ø1.0mm                              | TiSiN         | 329          |                              |
| TA   |  | Threading<br>螺紋車削                    | Ø2.3mm~Ø6.0mm                       | TiSiN         | 329          | 331                          |



## ■ 索引 INDEX

|  |     |
|--|-----|
| ■ 公司簡介 Company Profile                     | 002 |
| ■ 使用說明 User's Guide                        | 004 |
| ■ 產品索引 Products Index                      | 007 |
| ■ 產品規格 Products Specifications             | 008 |
| ■ 切削參數 Cutting Condition                   | 332 |
| ■ 塗層特色 Coating Advantage                   | 470 |
| ■ 技術資料 Technical Information               | 486 |
| 立銑刀各部位名稱 Detail of the End Mill            | 486 |
| 切削條件計算公式 General Cutting Condition Formula | 487 |
| 故障分析與對策 Failure Analyzed and Solvent       | 488 |
| 硬度換算表 Hardness Conversion Table            | 490 |
| ■ 附件 Appendix                              | 491 |
| 訂製刀具需求表 Custom Tool Requirements Form      | 491 |



# 600 PLUS

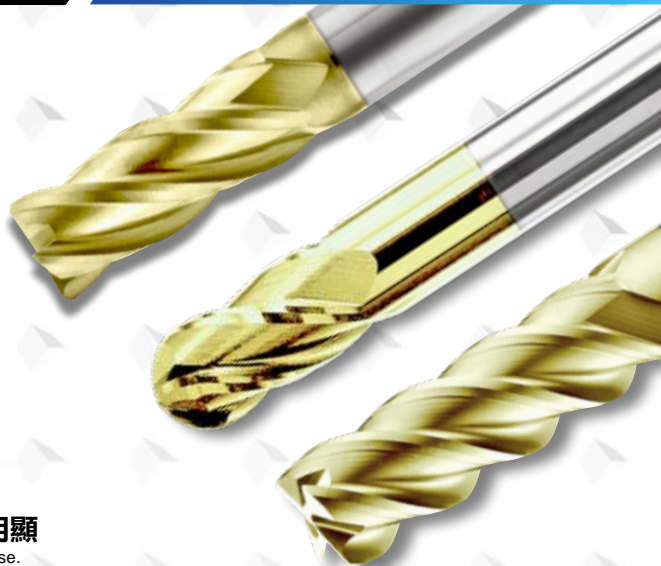
SERIES

## General Series 泛用系列

600 PLUS Series - Taper Core Design  
for General Application  
高效系列 - 不等心厚刀型設計

## 600 PLUS 系列

### 600 Plus series



1 特殊刀型設計 + 強化刃口崩角設計，使刀具有最大的鋼性，同時擁有最大的有效排屑空間

Maximized rigidity, and chip removals are greatly improved due to special geometric design and reinforced design in cutting edges against chipping at corners.



video 切削影片

2 抑制顫振及噪音的效果更加明顯

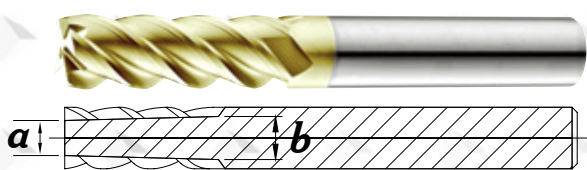
Excellent performance of anti-vibration and noise.

3 刀具塗層：震虎獨家高硬度專用塗層，有效提高刀具壽命跟加工表面精度

High hardness-used coating, effectively improves tool life and finishes.

此刀型設計  
可提升加工效率

This shape makes more efficient



$$b > a$$

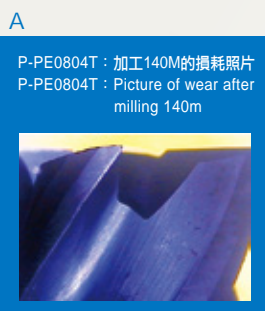
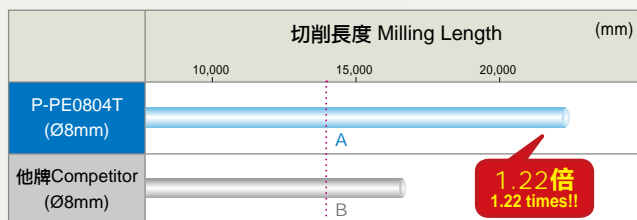
Taper Core 錐型心厚



本設計獲得台灣銑刀改良結構專利：M 476013 專利產品 仿冒必究  
Enhanced geometry of end mills Patent of Taiwan: M 476013 Patent product, all rights reserved

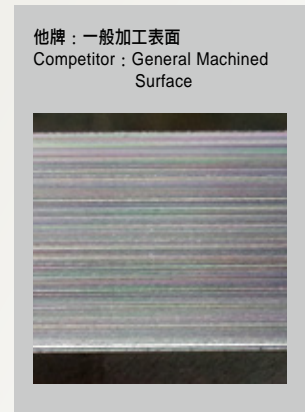
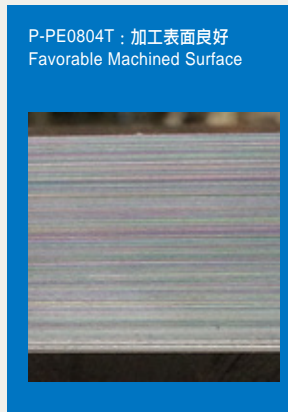
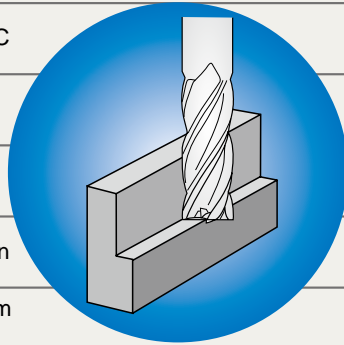
長壽命! 600 PLUS新刀型使壽命增加22%  
New geometry for 600 PLUS can prolong tool life by 22%!

|                                    |                                      |
|------------------------------------|--------------------------------------|
| 工具<br>Tool                         | P-PE0804T                            |
| 工件<br>Work Material                | 中碳鋼 S45C                             |
| 加工方式<br>Milling Type               | 側銑<br>Side milling                   |
| 切削速度<br>Milling Speed              | 100m/min                             |
| 進給速度<br>Speed (min <sup>-1</sup> ) | 1400mm/min                           |
| 切深<br>Depth of cut                 | ap=15.00mm<br>ae=1.00mm              |
| 冷卻方式<br>Cooling Way                | 空冷<br>Air Blow                       |
| 使用機台<br>Machine                    | 立式綜合加工機<br>Vertical Machining Center |



600 PLUS新刀型能夠減少加工時產生的震顫，銑出良好的加工表面  
 The new developed 600 PLUS enable to operate stable without chipping and produce a superb surface finish.

|                                    |                                      |
|------------------------------------|--------------------------------------|
| 工具<br>Tool                         | P-PE0804T                            |
| 工件<br>Work Material                | 中碳鋼 S45C                             |
| 加工方式<br>Milling Type               | 側銑<br>Side milling                   |
| 切削速度<br>Milling Speed              | 100m/min                             |
| 進給速度<br>Speed (min <sup>-1</sup> ) | 1400mm/min                           |
| 切深<br>Depth of cut                 | ap=15.00mm<br>ae=1.00mm              |
| 冷卻方式<br>Cooling Way                | 空冷<br>Air Blow                       |
| 使用機台<br>Machine                    | 立式綜合加工機<br>Vertical Machining Center |



效率UP! 600 PLUS實現高速加工，節省加工時間25% ↑  
 Achieving efficient machining by 600 PLUS ; Milling time reduced by more than 25%!

| 工具<br>Tool                         | 他牌 Competitor<br>Ø8mm                | SPEED TIGER 600 PLUS<br>P-PE0804T |
|------------------------------------|--------------------------------------|-----------------------------------|
| 工件<br>Work Material                | 中碳鋼 S50C                             |                                   |
| 加工方式<br>Milling Type               | 側銑<br>Side milling                   |                                   |
| 切削速度<br>Milling Speed              | 100m/min                             | 100m/min                          |
| 進給速度<br>Speed (min <sup>-1</sup> ) | 2200mm/min                           | 2800mm/min                        |
| 切深<br>Depth of cut                 | ap=15.00mm<br>ae=1.00mm              |                                   |
| 加工長度<br>Working Length             | 110m                                 |                                   |
| 加工時間<br>Working Time               | 500min                               | 392min                            |
| 冷卻方式<br>Cooling Way                | 空冷<br>Air Blow                       |                                   |
| 使用機台<br>Machine                    | 立式綜合加工機<br>Vertical Machining Center |                                   |

他牌 Competitor  
 加工時間  
8小時20分鐘  
Cutting Time  
8hr 20min

為您省下25%加工時間  
SAVE your time 25% ↑

SPEED TIGER  
600 PLUS  
 加工時間  
6小時32分鐘  
Cutting Time  
6hr 32min

# 600<sup>+</sup>

切削條件表 P332  
Cutting Condition

## Miniature Square Type - 2 flutes

### 2刃微小徑立銑刀

600 PLUS

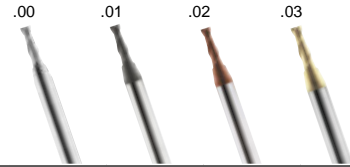
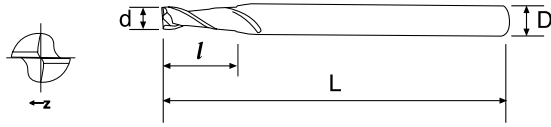
HRC > 40

35°

$a < b$   
 $b > a$

● Super Ultra Fine Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65

HRC > 70

HRC > 75

HRC > 80

HRC > 85

HRC > 90

HRC > 95

HRC > 100

HRC > 105

HRC > 110

HRC > 115

HRC > 120

HRC > 125

HRC > 130

HRC > 135

HRC > 140

HRC > 145

HRC > 150

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 0.2          | 0.4          | 50          | 4              | 2      | P-MIE0022          | .00        | .01   | .02   | .03 |
| 0.3          | 0.6          | 50          | 4              | 2      | P-MIE0032          | .00        | .01   | .02   | .03 |
| 0.4          | 0.8          | 50          | 4              | 2      | P-MIE0042          | .00        | .01   | .02   | .03 |
| 0.5          | 1            | 50          | 4              | 2      | P-MIE0052          | .00        | .01   | .02   | .03 |
| 0.6          | 1.2          | 50          | 4              | 2      | P-MIE0062          | .00        | .01   | .02   | .03 |
| 0.7          | 1.4          | 50          | 4              | 2      | P-MIE0072          | .00        | .01   | .02   | .03 |
| 0.8          | 1.6          | 50          | 4              | 2      | P-MIE0082          | .00        | .01   | .02   | .03 |
| 0.9          | 1.8          | 50          | 4              | 2      | P-MIE0092          | .00        | .01   | .02   | .03 |
| 1            | 3            | 50          | 4              | 2      | P-MIE0102          | .00        | .01   | .02   | .03 |
| 1.1          | 3            | 50          | 4              | 2      | P-MIE0112          | .00        | .01   | .02   | .03 |
| 1.2          | 3            | 50          | 4              | 2      | P-MIE0122          | .00        | .01   | .02   | .03 |
| 1.3          | 3            | 50          | 4              | 2      | P-MIE0132          | .00        | .01   | .02   | .03 |
| 1.4          | 3            | 50          | 4              | 2      | P-MIE0142          | .00        | .01   | .02   | .03 |
| 1.5          | 4            | 50          | 4              | 2      | P-MIE0152          | .00        | .01   | .02   | .03 |
| 1.6          | 4            | 50          | 4              | 2      | P-MIE0162          | .00        | .01   | .02   | .03 |
| 1.7          | 4            | 50          | 4              | 2      | P-MIE0172          | .00        | .01   | .02   | .03 |
| 1.8          | 4            | 50          | 4              | 2      | P-MIE0182          | .00        | .01   | .02   | .03 |
| 1.9          | 4            | 50          | 4              | 2      | P-MIE0192          | .00        | .01   | .02   | .03 |
| 2            | 6            | 50          | 4              | 2      | P-MIE0202          | .00        | .01   | .02   | .03 |
| 2.1          | 6            | 50          | 4              | 2      | P-MIE0212          | .00        | .01   | .02   | .03 |
| 2.2          | 6            | 50          | 4              | 2      | P-MIE0222          | .00        | .01   | .02   | .03 |
| 2.3          | 6            | 50          | 4              | 2      | P-MIE0232          | .00        | .01   | .02   | .03 |
| 2.4          | 6            | 50          | 4              | 2      | P-MIE0242          | .00        | .01   | .02   | .03 |
| 2.5          | 8            | 50          | 4              | 2      | P-MIE0252          | .00        | .01   | .02   | .03 |
| 2.6          | 8            | 50          | 4              | 2      | P-MIE0262          | .00        | .01   | .02   | .03 |
| 2.7          | 8            | 50          | 4              | 2      | P-MIE0272          | .00        | .01   | .02   | .03 |
| 2.8          | 8            | 50          | 4              | 2      | P-MIE0282          | .00        | .01   | .02   | .03 |
| 2.9          | 8            | 50          | 4              | 2      | P-MIE0292          | .00        | .01   | .02   | .03 |
| 3            | 8            | 50          | 4              | 2      | P-MIE0302          | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTIBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

## 600<sup>+</sup> 切削條件表 P333 Cutting Condition

### Square Type - 2 flutes

## 2刃立銑刀

600 PLUS

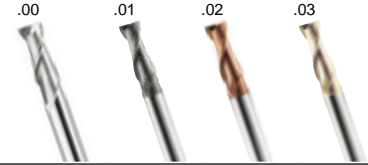
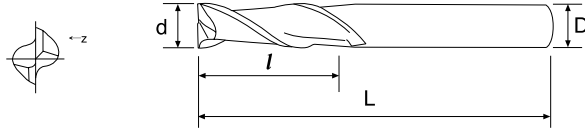
HRC > 45

35°

a/b > a

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1            | 3            | 50          | 3              | 2      | P-SSE0102          | .00        | .01    | .02   | .03   |
| 1            | 3            | 50          | 4              | 2      | P-MSE0102          | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 3              | 2      | P-SSE0152          | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 4              | 2      | P-MSE0152          | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 3              | 2      | P-SSE0202          | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 4              | 2      | P-MSE0202          | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 3              | 2      | P-SSE0252          | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 4              | 2      | P-MSE0252          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 3              | 2      | P-SSE0302          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 4              | 2      | P-MSE0302          | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 4              | 2      | P-MSE0352          | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 4              | 2      | P-MSE0402          | .00        | .01    | .02   | .03   |
| 1            | 3            | 50          | 6              | 2      | P-SE0102           | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 6              | 2      | P-SE0152           | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 6              | 2      | P-SE0202           | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 6              | 2      | P-SE0252           | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 6              | 2      | P-SE0302           | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 6              | 2      | P-SE0352           | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 6              | 2      | P-SE0402           | .00        | .01    | .02   | .03   |
| 4.5          | 13           | 50          | 6              | 2      | P-SE0452           | .00        | .01    | .02   | .03   |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]

Application 適用材質: ★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        | ○      |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

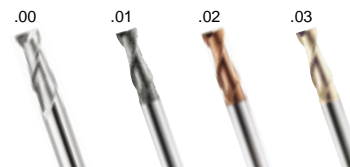
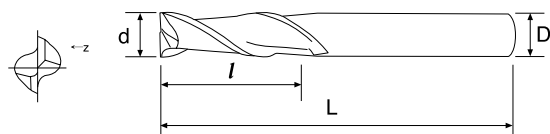
## 600<sup>+</sup> 切削條件表 P333 Cutting Condition

### Square Type - 2 flutes ■ 2刃立銑刀

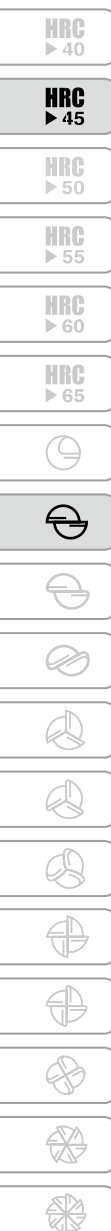


● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 5            | 13           | 50          | 6              | 2      | P-SE0502           | .00        | .01    | .02   | .03   |
| 5.5          | 13           | 50          | 6              | 2      | P-SE0552           | .00        | .01    | .02   | .03   |
| 6            | 16           | 50          | 6              | 2      | P-SE0602           | .00        | .01    | .02   | .03   |
| 6.5          | 16           | 60          | 8              | 2      | P-SE0652           | .00        | .01    | .02   | .03   |
| 7            | 16           | 60          | 8              | 2      | P-SE0702           | .00        | .01    | .02   | .03   |
| 7.5          | 19           | 60          | 8              | 2      | P-SE0752           | .00        | .01    | .02   | .03   |
| 8            | 20           | 60          | 8              | 2      | P-SE0802           | .00        | .01    | .02   | .03   |
| 8.5          | 20           | 75          | 10             | 2      | P-SE0852           | .00        | .01    | .02   | .03   |
| 9            | 20           | 75          | 10             | 2      | P-SE0902           | .00        | .01    | .02   | .03   |
| 9.5          | 25           | 75          | 10             | 2      | P-SE0952           | .00        | .01    | .02   | .03   |
| 10           | 25           | 75          | 10             | 2      | P-SE1002           | .00        | .01    | .02   | .03   |
| 10.5         | 25           | 75          | 12             | 2      | P-SE1052           | .00        | .01    | .02   | .03   |
| 11           | 30           | 75          | 12             | 2      | P-SE1102           | .00        | .01    | .02   | .03   |
| 11.5         | 30           | 75          | 12             | 2      | P-SE1152           | .00        | .01    | .02   | .03   |
| 12           | 32           | 75          | 12             | 2      | P-SE1202           | .00        | .01    | .02   | .03   |
| 14           | 40           | 100         | 16             | 2      | P-SE1402           | .00        | .01    | .02   | .03   |
| 16           | 40           | 100         | 16             | 2      | P-SE1602           | .00        | .01    | .02   | .03   |
| 18           | 45           | 100         | 20             | 2      | P-SE1802           | .00        | .01    | .02   | .03   |
| 20           | 45           | 100         | 20             | 2      | P-SE2002           | .00        | .01    | .02   | .03   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  |                           |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P334**  
Cutting Condition

Square Type - 4 flutes

## ■ 4刃立銑刀

**600 PLUS**

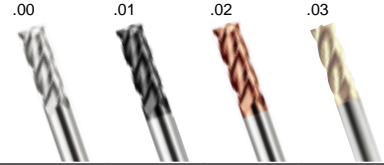
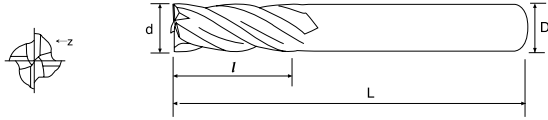
**HRC > 45**

**35°**

**a/b > a**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1            | 3            | 50          | 3              | 4      | P-SSE0104          | .00        | .01    | .02   | .03   |
| 1            | 3            | 50          | 4              | 4      | P-MSE0104          | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 3              | 4      | P-SSE0154          | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 4              | 4      | P-MSE0154          | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 3              | 4      | P-SSE0204          | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 4              | 4      | P-MSE0204          | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 3              | 4      | P-SSE0254          | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 4              | 4      | P-MSE0254          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 3              | 4      | P-SSE0304          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 4              | 4      | P-MSE0304          | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 4              | 4      | P-MSE0354          | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 4              | 4      | P-MSE0404          | .00        | .01    | .02   | .03   |
| 1            | 3            | 50          | 6              | 4      | P-SE0104           | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 6              | 4      | P-SE0154           | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 6              | 4      | P-SE0204           | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 6              | 4      | P-SE0254           | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 6              | 4      | P-SE0304           | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 6              | 4      | P-SE0354           | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 6              | 4      | P-SE0404           | .00        | .01    | .02   | .03   |
| 4.5          | 13           | 50          | 6              | 4      | P-SE0454           | .00        | .01    | .02   | .03   |
| 5            | 13           | 50          | 6              | 4      | P-SE0504           | .00        | .01    | .02   | .03   |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P334**  
Cutting Condition

Square Type - 4 flutes

## ■ 4刃立銑刀

600 PLUS

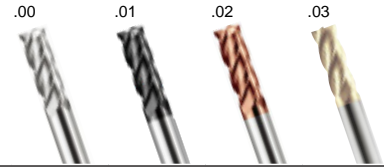
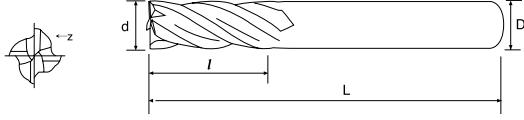
HRC > 45

35°

$a_1$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 5.5          | 13           | 50          | 6              | 4      | P-SE0554           | .00        | .01    | .02   | .03   |
| 6            | 16           | 50          | 6              | 4      | P-SE0604           | .00        | .01    | .02   | .03   |
| 6.5          | 16           | 60          | 8              | 4      | P-SE0654           | .00        | .01    | .02   | .03   |
| 7            | 16           | 60          | 8              | 4      | P-SE0704           | .00        | .01    | .02   | .03   |
| 7.5          | 19           | 60          | 8              | 4      | P-SE0754           | .00        | .01    | .02   | .03   |
| 8            | 20           | 60          | 8              | 4      | P-SE0804           | .00        | .01    | .02   | .03   |
| 8.5          | 20           | 75          | 10             | 4      | P-SE0854           | .00        | .01    | .02   | .03   |
| 9            | 20           | 75          | 10             | 4      | P-SE0904           | .00        | .01    | .02   | .03   |
| 9.5          | 25           | 75          | 10             | 4      | P-SE0954           | .00        | .01    | .02   | .03   |
| 10           | 30           | 75          | 10             | 4      | P-SE1004           | .00        | .01    | .02   | .03   |
| 10.5         | 30           | 75          | 12             | 4      | P-SE1054           | .00        | .01    | .02   | .03   |
| 11           | 30           | 75          | 12             | 4      | P-SE1104           | .00        | .01    | .02   | .03   |
| 11.5         | 30           | 75          | 12             | 4      | P-SE1154           | .00        | .01    | .02   | .03   |
| 12           | 32           | 75          | 12             | 4      | P-SE1204           | .00        | .01    | .02   | .03   |
| 14           | 40           | 100         | 16             | 4      | P-SE1404           | .00        | .01    | .02   | .03   |
| 16           | 40           | 100         | 16             | 4      | P-SE1604           | .00        | .01    | .02   | .03   |
| 18           | 45           | 100         | 20             | 4      | P-SE1804           | .00        | .01    | .02   | .03   |
| 20           | 45           | 100         | 20             | 4      | P-SE2004           | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |   |                     |                    |                           | ○                   | ○                  |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P335**  
Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

## ■ 3刃45° 立銑刀

**600 PLUS**

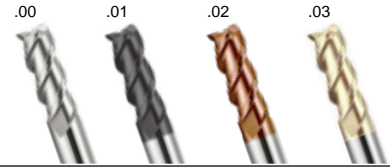
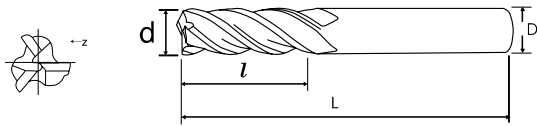
**HRC 45**

**45°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 1            | 3            | 50          | 4              | 3      | P-MPE0103          | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 4              | 3      | P-MPE0153          | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 4              | 3      | P-MPE0203          | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 4              | 3      | P-MPE0253          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 3              | 3      | P-MPE3303          | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 4              | 3      | P-MPE0303          | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 4              | 3      | P-MPE0353          | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 4              | 3      | P-MPE0403          | .00        | .01    | .02   | .03   |
| 1            | 3            | 50          | 6              | 3      | P-PE0103           | .00        | .01    | .02   | .03   |
| 1.5          | 4            | 50          | 6              | 3      | P-PE0153           | .00        | .01    | .02   | .03   |
| 2            | 6            | 50          | 6              | 3      | P-PE0203           | .00        | .01    | .02   | .03   |
| 2.5          | 8            | 50          | 6              | 3      | P-PE0253           | .00        | .01    | .02   | .03   |
| 3            | 8            | 50          | 6              | 3      | P-PE0303           | .00        | .01    | .02   | .03   |
| 3.5          | 10           | 50          | 6              | 3      | P-PE0353           | .00        | .01    | .02   | .03   |
| 4            | 11           | 50          | 6              | 3      | P-PE0403           | .00        | .01    | .02   | .03   |
| 4.5          | 13           | 50          | 6              | 3      | P-PE0453           | .00        | .01    | .02   | .03   |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |   |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ◎      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P335**  
Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

## 3刃45° 立銑刀

600 PLUS

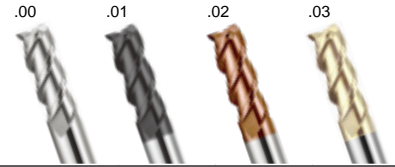
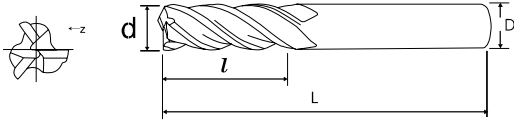
HRC 45

45°

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC >40

HRC >45

HRC >50

HRC >55

HRC >60

HRC >65

HRC >70

HRC >75

HRC >80

HRC >85

HRC >90

HRC >95

HRC >100

HRC >105

HRC >110

HRC >115

HRC >120

HRC >125

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |     |
| 5            | 13           | 50          | 6              | 3      | P-PE0503           | .00        | .01   | .02   | .03 |
| 5.5          | 13           | 50          | 6              | 3      | P-PE0553           | .00        | .01   | .02   | .03 |
| 6            | 16           | 50          | 6              | 3      | P-PE0603           | .00        | .01   | .02   | .03 |
| 6.5          | 16           | 60          | 8              | 3      | P-PE0653           | .00        | .01   | .02   | .03 |
| 7            | 16           | 60          | 8              | 3      | P-PE0703           | .00        | .01   | .02   | .03 |
| 7.5          | 19           | 60          | 8              | 3      | P-PE0753           | .00        | .01   | .02   | .03 |
| 8            | 20           | 60          | 8              | 3      | P-PE0803           | .00        | .01   | .02   | .03 |
| 8.5          | 20           | 75          | 10             | 3      | P-PE0853           | .00        | .01   | .02   | .03 |
| 9            | 20           | 75          | 10             | 3      | P-PE0903           | .00        | .01   | .02   | .03 |
| 9.5          | 25           | 75          | 10             | 3      | P-PE0953           | .00        | .01   | .02   | .03 |
| 10           | 30           | 75          | 10             | 3      | P-PE1003           | .00        | .01   | .02   | .03 |
| 10.5         | 30           | 75          | 12             | 3      | P-PE1053           | .00        | .01   | .02   | .03 |
| 11           | 30           | 75          | 12             | 3      | P-PE1103           | .00        | .01   | .02   | .03 |
| 11.5         | 30           | 75          | 12             | 3      | P-PE1153           | .00        | .01   | .02   | .03 |
| 12           | 32           | 75          | 12             | 3      | P-PE1203           | .00        | .01   | .02   | .03 |
| 14           | 40           | 100         | 16             | 3      | P-PE1403           | .00        | .01   | .02   | .03 |
| 16           | 40           | 100         | 16             | 3      | P-PE1603           | .00        | .01   | .02   | .03 |
| 18           | 45           | 100         | 20             | 3      | P-PE1803           | .00        | .01   | .02   | .03 |
| 20           | 45           | 100         | 20             | 3      | P-PE2003           | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P334**  
Cutting Condition

Square Type - Helix Angle 45° - 4 flutes

## ■ 4刃45° 立銑刀

**600 PLUS**

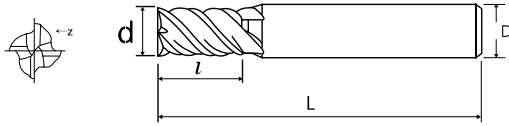
**HRC > 45**

**45°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 1            | 3            | 50          | 4              | 4      | P-MPE0104          | .00        | .01   | .02   | .03 |
| 1.5          | 4            | 50          | 4              | 4      | P-MPE0154          | .00        | .01   | .02   | .03 |
| 2            | 6            | 50          | 4              | 4      | P-MPE0204          | .00        | .01   | .02   | .03 |
| 2.5          | 8            | 50          | 4              | 4      | P-MPE0254          | .00        | .01   | .02   | .03 |
| 3            | 8            | 50          | 3              | 4      | P-MPE3304          | .00        | .01   | .02   | .03 |
| 3            | 8            | 50          | 4              | 4      | P-MPE0304          | .00        | .01   | .02   | .03 |
| 3.5          | 10           | 50          | 4              | 4      | P-MPE0354          | .00        | .01   | .02   | .03 |
| 4            | 11           | 50          | 4              | 4      | P-MPE0404          | .00        | .01   | .02   | .03 |
| 1            | 3            | 50          | 6              | 4      | P-PE0104           | .00        | .01   | .02   | .03 |
| 1.5          | 4            | 50          | 6              | 4      | P-PE0154           | .00        | .01   | .02   | .03 |
| 2            | 6            | 50          | 6              | 4      | P-PE0204           | .00        | .01   | .02   | .03 |
| 2.5          | 8            | 50          | 6              | 4      | P-PE0254           | .00        | .01   | .02   | .03 |
| 3            | 8            | 50          | 6              | 4      | P-PE0304           | .00        | .01   | .02   | .03 |
| 3.5          | 10           | 50          | 6              | 4      | P-PE0354           | .00        | .01   | .02   | .03 |
| 4            | 11           | 50          | 6              | 4      | P-PE0404           | .00        | .01   | .02   | .03 |
| 4.5          | 13           | 50          | 6              | 4      | P-PE0454           | .00        | .01   | .02   | .03 |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |   |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ◎      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P334**  
Cutting Condition

## Square Type - Helix Angle 45° - 4 flutes

### ■ 4刃45° 立銑刀

**600 PLUS**

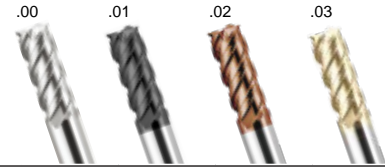
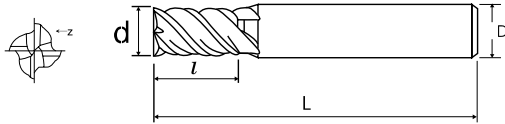
**HRC 45**

**45°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |     |
| 5            | 13           | 50          | 6              | 4      | P-PE0504           | .00        | .01   | .02   | .03 |
| 5.5          | 13           | 50          | 6              | 4      | P-PE0554           | .00        | .01   | .02   | .03 |
| 6            | 16           | 50          | 6              | 4      | P-PE0604           | .00        | .01   | .02   | .03 |
| 6.5          | 16           | 60          | 8              | 4      | P-PE0654           | .00        | .01   | .02   | .03 |
| 7            | 16           | 60          | 8              | 4      | P-PE0704           | .00        | .01   | .02   | .03 |
| 7.5          | 19           | 60          | 8              | 4      | P-PE0754           | .00        | .01   | .02   | .03 |
| 8            | 20           | 60          | 8              | 4      | P-PE0804           | .00        | .01   | .02   | .03 |
| 8.5          | 20           | 75          | 10             | 4      | P-PE0854           | .00        | .01   | .02   | .03 |
| 9            | 20           | 75          | 10             | 4      | P-PE0904           | .00        | .01   | .02   | .03 |
| 9.5          | 25           | 75          | 10             | 4      | P-PE0954           | .00        | .01   | .02   | .03 |
| 10           | 30           | 75          | 10             | 4      | P-PE1004           | .00        | .01   | .02   | .03 |
| 10.5         | 30           | 75          | 12             | 4      | P-PE1054           | .00        | .01   | .02   | .03 |
| 11           | 30           | 75          | 12             | 4      | P-PE1104           | .00        | .01   | .02   | .03 |
| 11.5         | 30           | 75          | 12             | 4      | P-PE1154           | .00        | .01   | .02   | .03 |
| 12           | 32           | 75          | 12             | 4      | P-PE1204           | .00        | .01   | .02   | .03 |
| 14           | 40           | 100         | 16             | 4      | P-PE1404           | .00        | .01   | .02   | .03 |
| 16           | 40           | 100         | 16             | 4      | P-PE1604           | .00        | .01   | .02   | .03 |
| 18           | 45           | 100         | 20             | 4      | P-PE1804           | .00        | .01   | .02   | .03 |
| 20           | 45           | 100         | 20             | 4      | P-PE2004           | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P332**  
Cutting Condition

## Square Type - Long Shank - 2 flutes

### ■ 2刃長柄立銑刀

**600 PLUS**

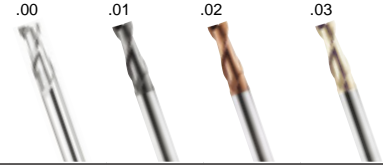
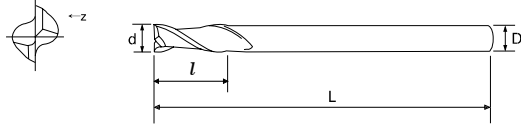
**HRC > 45**

**35°**

**a1**  
**b > a**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 6            | 16           | 75          | 6              | 2      | P-SLE0602          | .00        | .01    | .02   | .03   |
| 6            | 16           | 100         | 6              | 2      | P-MLE0602          | .00        | .01    | .02   | .03   |
| 8            | 20           | 75          | 8              | 2      | P-SLE0802          | .00        | .01    | .02   | .03   |
| 8            | 20           | 100         | 8              | 2      | P-MLE0802          | .00        | .01    | .02   | .03   |
| 10           | 25           | 100         | 10             | 2      | P-SLE1002          | .00        | .01    | .02   | .03   |
| 10           | 25           | 150         | 10             | 2      | P-MLE1002          | .00        | .01    | .02   | .03   |
| 12           | 32           | 100         | 12             | 2      | P-SLE1202          | .00        | .01    | .02   | .03   |
| 12           | 32           | 150         | 12             | 2      | P-MLE1202          | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |   |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                      | ○                  | ○      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P336-337**  
Cutting Condition

## Square Type - Long Shank - 4 flutes

### ■ 4刃長柄立銑刀

**600 PLUS**

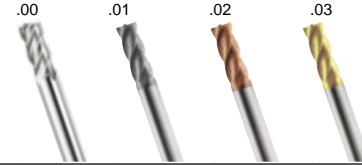
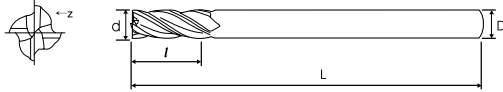
**HRC > 45**

**35°**

$a_1$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 6            | 16           | 75          | 6              | 4      | P-SLE0604          | .00        | .01   | .02   | .03 |
| 6            | 16           | 100         | 6              | 4      | P-MLE0604          | .00        | .01   | .02   | .03 |
| 8            | 20           | 75          | 8              | 4      | P-SLE0804          | .00        | .01   | .02   | .03 |
| 8            | 20           | 100         | 8              | 4      | P-MLE0804          | .00        | .01   | .02   | .03 |
| 10           | 30           | 100         | 10             | 4      | P-SLE1004          | .00        | .01   | .02   | .03 |
| 10           | 30           | 150         | 10             | 4      | P-MLE1004          | .00        | .01   | .02   | .03 |
| 12           | 32           | 100         | 12             | 4      | P-SLE1204          | .00        | .01   | .02   | .03 |
| 12           | 32           | 150         | 12             | 4      | P-MLE1204          | .00        | .01   | .02   | .03 |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |   |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ○                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ○      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P338**  
Cutting Condition

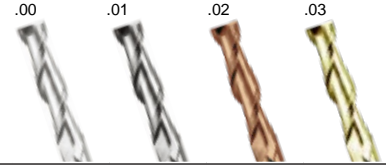
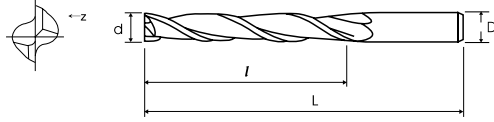
## Square Type - Long Flute - 2 flutes

### 2刃長刃立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 1            | 7            | 50          | 4              | 2      | P-LET0102          | .00        | .01    | .02   | .03   |
| 1.5          | 9            | 50          | 4              | 2      | P-LET0152          | .00        | .01    | .02   | .03   |
| 2            | 12           | 50          | 4              | 2      | P-LET0202          | .00        | .01    | .02   | .03   |
| 2.5          | 12           | 50          | 4              | 2      | P-LET0252          | .00        | .01    | .02   | .03   |
| 3            | 15           | 60          | 6              | 2      | P-LET0302          | .00        | .01    | .02   | .03   |
| 3.5          | 15           | 60          | 6              | 2      | P-LET0352          | .00        | .01    | .02   | .03   |
| 4            | 20           | 75          | 6              | 2      | P-LET0402          | .00        | .01    | .02   | .03   |
| 4.5          | 20           | 75          | 6              | 2      | P-LET0452          | .00        | .01    | .02   | .03   |
| 5            | 25           | 75          | 6              | 2      | P-LET0502          | .00        | .01    | .02   | .03   |
| 5.5          | 25           | 75          | 6              | 2      | P-LET0552          | .00        | .01    | .02   | .03   |
| 6            | 30           | 75          | 6              | 2      | P-LET0602          | .00        | .01    | .02   | .03   |
| 7            | 30           | 100         | 8              | 2      | P-LET0702          | .00        | .01    | .02   | .03   |
| 8            | 40           | 100         | 8              | 2      | P-LET0802          | .00        | .01    | .02   | .03   |
| 9            | 40           | 100         | 10             | 2      | P-LET0902          | .00        | .01    | .02   | .03   |
| 10           | 40           | 100         | 10             | 2      | P-LET1002          | .00        | .01    | .02   | .03   |
| 11           | 40           | 100         | 12             | 2      | P-LET1102          | .00        | .01    | .02   | .03   |
| 12           | 50           | 100         | 12             | 2      | P-LET1202          | .00        | .01    | .02   | .03   |
| 14           | 50           | 150         | 16             | 2      | P-LET1402          | .00        | .01    | .02   | .03   |
| 16           | 60           | 150         | 16             | 2      | P-LET1602          | .00        | .01    | .02   | .03   |
| 20           | 90           | 200         | 20             | 2      | P-LET2002          | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTIBN     | ◎                                  | ◎                    | ○                  | ○      |        | ○      |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P339**  
Cutting Condition

## Square Type - Long Flute - 4 flutes

### ■ 4刃長刃立銑刀

**600 PLUS**

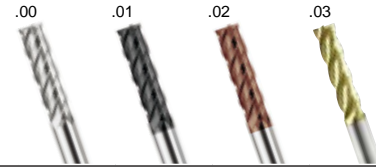
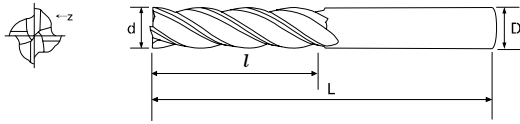
**HRC 45**

**35°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC 40

HRC 45

HRC 50

HRC 55

HRC 60

HRC 65

HRC 70

HRC 75

HRC 80

HRC 85

HRC 90

HRC 95

HRC 100

HRC 105

HRC 110

HRC 115

HRC 120

HRC 125

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 1            | 6            | 50          | 4              | 4      | P-LET0104          | .00        | .01   | .02   | .03 |
| 1.5          | 9            | 50          | 4              | 4      | P-LET0154          | .00        | .01   | .02   | .03 |
| 2            | 12           | 50          | 4              | 4      | P-LET0204          | .00        | .01   | .02   | .03 |
| 2.5          | 12           | 50          | 4              | 4      | P-LET0254          | .00        | .01   | .02   | .03 |
| 3            | 15           | 60          | 6              | 4      | P-LET0304          | .00        | .01   | .02   | .03 |
| 3.5          | 15           | 60          | 6              | 4      | P-LET0354          | .00        | .01   | .02   | .03 |
| 4            | 20           | 75          | 6              | 4      | P-LET0404          | .00        | .01   | .02   | .03 |
| 4.5          | 20           | 75          | 6              | 4      | P-LET0454          | .00        | .01   | .02   | .03 |
| 5            | 25           | 75          | 6              | 4      | P-LET0504          | .00        | .01   | .02   | .03 |
| 5.5          | 25           | 75          | 6              | 4      | P-LET0554          | .00        | .01   | .02   | .03 |
| 6            | 30           | 75          | 6              | 4      | P-LET0604          | .00        | .01   | .02   | .03 |
| 7            | 30           | 100         | 8              | 4      | P-LET0704          | .00        | .01   | .02   | .03 |
| 8            | 40           | 100         | 8              | 4      | P-LET0804          | .00        | .01   | .02   | .03 |
| 9            | 40           | 100         | 10             | 4      | P-LET0904          | .00        | .01   | .02   | .03 |
| 10           | 40           | 100         | 10             | 4      | P-LET1004          | .00        | .01   | .02   | .03 |
| 11           | 40           | 100         | 12             | 4      | P-LET1104          | .00        | .01   | .02   | .03 |
| 12           | 50           | 100         | 12             | 4      | P-LET1204          | .00        | .01   | .02   | .03 |
| 14           | 50           | 150         | 16             | 4      | P-LET1404          | .00        | .01   | .02   | .03 |
| 16           | 60           | 150         | 16             | 4      | P-LET1604          | .00        | .01   | .02   | .03 |
| 20           | 90           | 200         | 20             | 4      | P-LET2004          | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P340-341**  
Cutting Condition

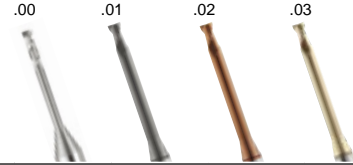
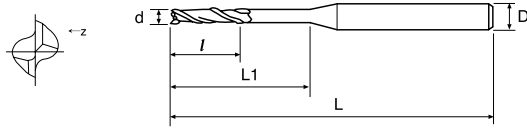
## Square Type - Long Neck - 2 flutes

### 2刃深溝長頸立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 0.5          | 0.75         | 2                | 50          | 4              | 2      | P-LNT05022         | .00        | .01    | .02   | .03   |
| 0.5          | 0.75         | 4                | 50          | 4              | 2      | P-LNT05042         | .00        | .01    | .02   | .03   |
| 0.5          | 0.75         | 6                | 50          | 4              | 2      | P-LNT05062         | .00        | .01    | .02   | .03   |
| 0.6          | 0.9          | 2                | 50          | 4              | 2      | P-LNT06022         | .00        | .01    | .02   | .03   |
| 0.6          | 0.9          | 4                | 50          | 4              | 2      | P-LNT06042         | .00        | .01    | .02   | .03   |
| 0.6          | 0.9          | 6                | 50          | 4              | 2      | P-LNT06062         | .00        | .01    | .02   | .03   |
| 0.7          | 1.1          | 4                | 50          | 4              | 2      | P-LNT07042         | .00        | .01    | .02   | .03   |
| 0.7          | 1.1          | 6                | 50          | 4              | 2      | P-LNT07062         | .00        | .01    | .02   | .03   |
| 0.8          | 1.2          | 4                | 50          | 4              | 2      | P-LNT08042         | .00        | .01    | .02   | .03   |
| 0.8          | 1.2          | 6                | 50          | 4              | 2      | P-LNT08062         | .00        | .01    | .02   | .03   |
| 0.8          | 1.2          | 8                | 50          | 4              | 2      | P-LNT08082         | .00        | .01    | .02   | .03   |
| 0.9          | 1.4          | 6                | 50          | 4              | 2      | P-LNT09062         | .00        | .01    | .02   | .03   |
| 0.9          | 1.4          | 8                | 50          | 4              | 2      | P-LNT09082         | .00        | .01    | .02   | .03   |
| 0.9          | 1.4          | 10               | 50          | 4              | 2      | P-LNT09102         | .00        | .01    | .02   | .03   |
| 1            | 1.5          | 6                | 50          | 4              | 2      | P-LNT10062         | .00        | .01    | .02   | .03   |
| 1            | 1.5          | 8                | 50          | 4              | 2      | P-LNT10082         | .00        | .01    | .02   | .03   |
| 1            | 1.5          | 10               | 50          | 4              | 2      | P-LNT10102         | .00        | .01    | .02   | .03   |
| 1            | 1.5          | 12               | 50          | 4              | 2      | P-LNT10122         | .00        | .01    | .02   | .03   |
| 1            | 1.5          | 16               | 50          | 4              | 2      | P-LNT10162         | .00        | .01    | .02   | .03   |
| 1.2          | 1.8          | 6                | 50          | 4              | 2      | P-LNT12062         | .00        | .01    | .02   | .03   |
| 1.2          | 1.8          | 8                | 50          | 4              | 2      | P-LNT12082         | .00        | .01    | .02   | .03   |
| 1.2          | 1.8          | 10               | 50          | 4              | 2      | P-LNT12102         | .00        | .01    | .02   | .03   |
| 1.2          | 1.8          | 12               | 50          | 4              | 2      | P-LNT12122         | .00        | .01    | .02   | .03   |
| 1.4          | 2.1          | 6                | 50          | 4              | 2      | P-LNT14062         | .00        | .01    | .02   | .03   |
| 1.4          | 2.1          | 10               | 50          | 4              | 2      | P-LNT14102         | .00        | .01    | .02   | .03   |

Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

## 600<sup>+</sup> 切削條件表 P340-341

Cutting Condition

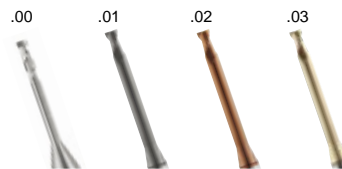
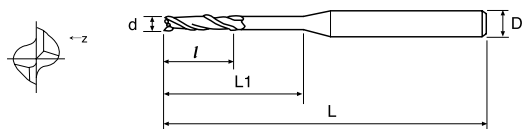
### Square Type - Long Neck - 2 flutes

## 2刃深溝長頸立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 1.4          | 2.1          | 16               | 50          | 4              | 2      | P-LNT14162         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 6                | 50          | 4              | 2      | P-LNT15062         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 8                | 50          | 4              | 2      | P-LNT15082         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 10               | 50          | 4              | 2      | P-LNT15102         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 12               | 50          | 4              | 2      | P-LNT15122         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 14               | 50          | 4              | 2      | P-LNT15142         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 16               | 50          | 4              | 2      | P-LNT15162         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 18               | 50          | 4              | 2      | P-LNT15182         | .00        | .01   | .02   | .03 |
| 1.5          | 2.3          | 20               | 50          | 4              | 2      | P-LNT15202         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 6                | 50          | 4              | 2      | P-LNT16062         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 8                | 50          | 4              | 2      | P-LNT16082         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 10               | 50          | 4              | 2      | P-LNT16102         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 12               | 50          | 4              | 2      | P-LNT16122         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 14               | 50          | 4              | 2      | P-LNT16142         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 16               | 50          | 4              | 2      | P-LNT16162         | .00        | .01   | .02   | .03 |
| 1.6          | 2.4          | 18               | 50          | 4              | 2      | P-LNT16182         | .00        | .01   | .02   | .03 |
| 1.8          | 2.7          | 8                | 50          | 4              | 2      | P-LNT18082         | .00        | .01   | .02   | .03 |
| 1.8          | 2.7          | 14               | 50          | 4              | 2      | P-LNT18142         | .00        | .01   | .02   | .03 |
| 1.8          | 2.7          | 20               | 50          | 4              | 2      | P-LNT18202         | .00        | .01   | .02   | .03 |
| 2            | 3            | 6                | 50          | 4              | 2      | P-LNT20062         | .00        | .01   | .02   | .03 |
| 2            | 3            | 8                | 50          | 4              | 2      | P-LNT20082         | .00        | .01   | .02   | .03 |
| 2            | 3            | 10               | 50          | 4              | 2      | P-LNT20102         | .00        | .01   | .02   | .03 |
| 2            | 3            | 12               | 50          | 4              | 2      | P-LNT20122         | .00        | .01   | .02   | .03 |
| 2            | 3            | 14               | 50          | 4              | 2      | P-LNT20142         | .00        | .01   | .02   | .03 |
| 2            | 3            | 16               | 50          | 4              | 2      | P-LNT20162         | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTIBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P340-341**  
Cutting Condition

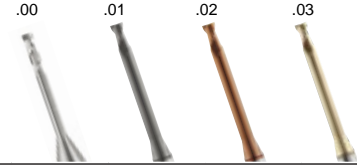
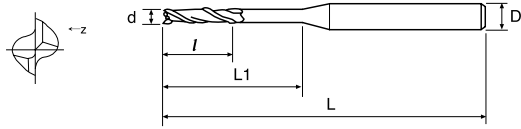
## Square Type - Long Neck - 2 flutes

### 2刃深溝長頸立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 2            | 3            | 18               | 50          | 4              | 2      | P-LNT20182         | .00        | .01    | .02   | .03   |
| 2            | 3            | 20               | 50          | 4              | 2      | P-LNT20202         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 8                | 50          | 4              | 2      | P-LNT25082         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 10               | 50          | 4              | 2      | P-LNT25102         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 12               | 50          | 4              | 2      | P-LNT25122         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 14               | 50          | 4              | 2      | P-LNT25142         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 16               | 50          | 4              | 2      | P-LNT25162         | .00        | .01    | .02   | .03   |
| 2.5          | 4            | 20               | 50          | 4              | 2      | P-LNT25202         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 8                | 50          | 6              | 2      | P-LNT30082         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 10               | 50          | 6              | 2      | P-LNT30102         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 12               | 50          | 6              | 2      | P-LNT30122         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 16               | 60          | 6              | 2      | P-LNT30162         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 20               | 60          | 6              | 2      | P-LNT30202         | .00        | .01    | .02   | .03   |
| 3            | 4.5          | 25               | 75          | 6              | 2      | P-LNT30252         | .00        | .01    | .02   | .03   |
| 3.5          | 6            | 12               | 50          | 6              | 2      | P-LNT35122         | .00        | .01    | .02   | .03   |
| 3.5          | 6            | 16               | 60          | 6              | 2      | P-LNT35162         | .00        | .01    | .02   | .03   |
| 3.5          | 6            | 20               | 75          | 6              | 2      | P-LNT35202         | .00        | .01    | .02   | .03   |
| 3.5          | 6            | 25               | 75          | 6              | 2      | P-LNT35252         | .00        | .01    | .02   | .03   |
| 3.5          | 6            | 30               | 75          | 6              | 2      | P-LNT35302         | .00        | .01    | .02   | .03   |
| 4            | 6            | 12               | 50          | 6              | 2      | P-LNT40122         | .00        | .01    | .02   | .03   |
| 4            | 6            | 16               | 60          | 6              | 2      | P-LNT40162         | .00        | .01    | .02   | .03   |
| 4            | 6            | 20               | 75          | 6              | 2      | P-LNT40202         | .00        | .01    | .02   | .03   |
| 4            | 6            | 25               | 75          | 6              | 2      | P-LNT40252         | .00        | .01    | .02   | .03   |
| 4            | 6            | 30               | 75          | 6              | 2      | P-LNT40302         | .00        | .01    | .02   | .03   |
| 4            | 6            | 35               | 75          | 6              | 2      | P-LNT40352         | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                        | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P342**  
Cutting Condition

## Fine Pitch & Roughing Type - 3 flutes

### 3刃粗精銑立銑刀

**600 PLUS**

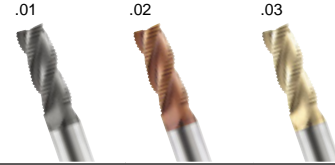
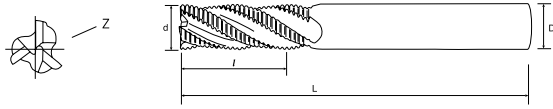
**HRC > 45**

**40°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |
| 4            | 8            | 50          | 6              | 3      | P-NTA0403          | .01        | .02   | .03   |
| 5            | 13           | 50          | 6              | 3      | P-NTA0503          | .01        | .02   | .03   |
| 6            | 16           | 50          | 6              | 3      | P-NTA0603          | .01        | .02   | .03   |
| 7            | 16           | 60          | 8              | 3      | P-NTA0703          | .01        | .02   | .03   |
| 8            | 19           | 60          | 8              | 3      | P-NTA0803          | .01        | .02   | .03   |
| 9            | 25           | 75          | 10             | 3      | P-NTA0903          | .01        | .02   | .03   |
| 10           | 25           | 75          | 10             | 3      | P-NTA1003          | .01        | .02   | .03   |
| 11           | 30           | 75          | 12             | 3      | P-NTA1103          | .01        | .02   | .03   |
| 12           | 30           | 75          | 12             | 3      | P-NTA1203          | .01        | .02   | .03   |
| 16           | 35           | 100         | 16             | 3      | P-NTA1603          | .01        | .02   | .03   |
| 20           | 45           | 100         | 20             | 3      | P-NTA2003          | .01        | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P343**  
Cutting Condition

## Fine Pitch & Roughing Type - 4 flutes

### 4刃粗精銑立銑刀

**600 PLUS**

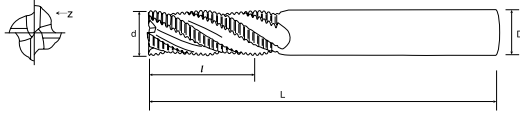
**HRC > 45**

**40°**

$\alpha > \beta$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiN      | TiSiN | ZrN-A |
| 4            | 8            | 50          | 6              | 4      | P-NTA0404          | .01        | .02   | .03   |
| 5            | 13           | 50          | 6              | 4      | P-NTA0504          | .01        | .02   | .03   |
| 6            | 16           | 50          | 6              | 4      | P-NTA0604          | .01        | .02   | .03   |
| 7            | 16           | 60          | 8              | 4      | P-NTA0704          | .01        | .02   | .03   |
| 8            | 19           | 60          | 8              | 4      | P-NTA0804          | .01        | .02   | .03   |
| 9            | 25           | 75          | 10             | 4      | P-NTA0904          | .01        | .02   | .03   |
| 10           | 25           | 75          | 10             | 4      | P-NTA1004          | .01        | .02   | .03   |
| 11           | 30           | 75          | 12             | 4      | P-NTA1104          | .01        | .02   | .03   |
| 12           | 30           | 75          | 12             | 4      | P-NTA1204          | .01        | .02   | .03   |
| 14           | 35           | 100         | 16             | 4      | P-NTA1404          | .01        | .02   | .03   |
| 15           | 35           | 100         | 16             | 4      | P-NTA1504          | .01        | .02   | .03   |
| 16           | 35           | 100         | 16             | 4      | P-NTA1604          | .01        | .02   | .03   |
| 20           | 45           | 100         | 20             | 4      | P-NTA2004          | .01        | .02   | .03   |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiN      | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P344**  
Cutting Condition

## Roughing Type - 3 flutes

### 3刃粗銑立銑刀

**600 PLUS**

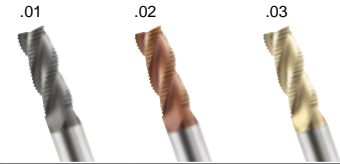
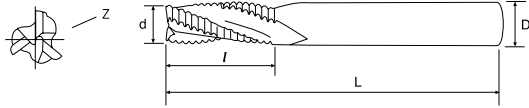
**HRC > 45**

**25°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |
| 4            | 8            | 50          | 6              | 3      | P-XTA0403          | .01        | .02   | .03   |
| 5            | 13           | 50          | 6              | 3      | P-XTA0503          | .01        | .02   | .03   |
| 6            | 16           | 50          | 6              | 3      | P-XTA0603          | .01        | .02   | .03   |
| 7            | 16           | 60          | 8              | 3      | P-XTA0703          | .01        | .02   | .03   |
| 8            | 19           | 60          | 8              | 3      | P-XTA0803          | .01        | .02   | .03   |
| 9            | 25           | 75          | 10             | 3      | P-XTA0903          | .01        | .02   | .03   |
| 10           | 25           | 75          | 10             | 3      | P-XTA1003          | .01        | .02   | .03   |
| 11           | 30           | 75          | 12             | 3      | P-XTA1103          | .01        | .02   | .03   |
| 12           | 30           | 75          | 12             | 3      | P-XTA1203          | .01        | .02   | .03   |
| 16           | 35           | 100         | 16             | 3      | P-XTA1603          | .01        | .02   | .03   |
| 20           | 45           | 100         | 20             | 3      | P-XTA2003          | .01        | .02   | .03   |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTIBN     | ◎                                  | ◎                      | ○                  |        |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ◎                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  |        |        |        | ○                   |                    |                           |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P345**  
Cutting Condition

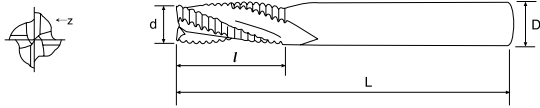
## Roughing Type - 4 flutes

### ■ 4粗銑立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |
| 4            | 8            | 50          | 6              | 4      | P-XTA0404          | .01        | .02   | .03   |
| 5            | 13           | 50          | 6              | 4      | P-XTA0504          | .01        | .02   | .03   |
| 6            | 16           | 50          | 6              | 4      | P-XTA0604          | .01        | .02   | .03   |
| 7            | 16           | 60          | 8              | 4      | P-XTA0704          | .01        | .02   | .03   |
| 8            | 19           | 60          | 8              | 4      | P-XTA0804          | .01        | .02   | .03   |
| 9            | 25           | 75          | 10             | 4      | P-XTA0904          | .01        | .02   | .03   |
| 10           | 25           | 75          | 10             | 4      | P-XTA1004          | .01        | .02   | .03   |
| 11           | 30           | 75          | 12             | 4      | P-XTA1104          | .01        | .02   | .03   |
| 12           | 30           | 75          | 12             | 4      | P-XTA1204          | .01        | .02   | .03   |
| 16           | 35           | 100         | 16             | 4      | P-XTA1604          | .01        | .02   | .03   |
| 20           | 45           | 100         | 20             | 4      | P-XTA2004          | .01        | .02   | .03   |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- (Various end mill icons)

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTIBN     | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ◎                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  |        |        |        | ○                   |                    |                           |                     |                    |

Unit/單位: mm

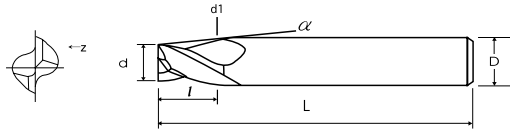
**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Square Type - 2 flutes ■ 2刃斜度立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |      |        | Purchase Code 採購代碼 |            |       |       |  |
|--------------|--------------|-------------|----------------|-------|------|--------|--------------------|------------|-------|-------|--|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1   | Flutes | MODE               | Coating 塗層 |       |       |  |
| d 刃徑         | ℓ 刃長         | L 全長        | D 柄徑           |       | 大徑   | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |  |
| 0.5          | 2            | 50          | 4              | 30°   | 0.53 | 2      | P-TTA005005        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 1°    | 0.57 | 2      | P-TTA005010        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 1°30' | 0.6  | 2      | P-TTA005015        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 2°    | 0.64 | 2      | P-TTA005020        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 2°30' | 0.67 | 2      | P-TTA005025        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 3°    | 0.71 | 2      | P-TTA005030        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 5°    | 0.85 | 2      | P-TTA005050        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 7°    | 0.99 | 2      | P-TTA005070        | .01        | .02   | .03   |  |
| 0.5          | 2            | 50          | 4              | 10°   | 1.21 | 2      | P-TTA005100        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 30°   | 1.07 | 2      | P-TTA010005        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 1°    | 1.14 | 2      | P-TTA010010        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 1°30' | 1.21 | 2      | P-TTA010015        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 2°    | 1.28 | 2      | P-TTA010020        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 2°30' | 1.35 | 2      | P-TTA010025        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 3°    | 1.42 | 2      | P-TTA010030        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 5°    | 1.7  | 2      | P-TTA010050        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 7°    | 1.98 | 2      | P-TTA010070        | .01        | .02   | .03   |  |
| 1            | 4            | 50          | 4              | 10°   | 2.41 | 2      | P-TTA010100        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 30°   | 1.59 | 2      | P-TTA015005        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 1°    | 1.67 | 2      | P-TTA015010        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 1°30' | 1.76 | 2      | P-TTA015015        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 2°    | 1.85 | 2      | P-TTA015020        | .01        | .02   | .03   |  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                      | ◎                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Square Type - 2 flutes

### 2 刃斜度立銑刀

**600 PLUS**

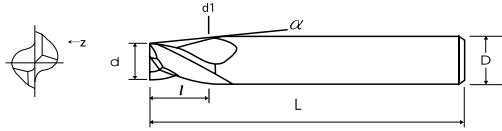
**HRC > 55**

**35°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |      |        | Purchase Code 採購代碼 |            |       |       |  |
|--------------|--------------|-------------|----------------|-------|------|--------|--------------------|------------|-------|-------|--|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1   | Flutes | MODE               | Coating 塗層 |       |       |  |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           |       | 大徑   | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |  |
| 1.5          | 5            | 50          | 4              | 2°30" | 1.93 | 2      | P-TTA015025        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 3°    | 2.02 | 2      | P-TTA015030        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 5°    | 2.37 | 2      | P-TTA015050        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 7°    | 2.73 | 2      | P-TTA015070        | .01        | .02   | .03   |  |
| 1.5          | 5            | 50          | 4              | 10°   | 3.26 | 2      | P-TTA015100        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 30"   | 2.1  | 2      | P-TTA020005        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 1°    | 2.21 | 2      | P-TTA020010        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 1°30" | 2.31 | 2      | P-TTA020015        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 2°    | 2.41 | 2      | P-TTA020020        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 2°30" | 2.52 | 2      | P-TTA020025        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 3°    | 2.62 | 2      | P-TTA020030        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 5°    | 3.05 | 2      | P-TTA020050        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 7°    | 3.47 | 2      | P-TTA020070        | .01        | .02   | .03   |  |
| 2            | 6            | 50          | 4              | 10°   | 4.11 | 2      | P-TTA020100        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 30"   | 2.64 | 2      | P-TTA025005        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 1°    | 2.78 | 2      | P-TTA025010        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 1°30" | 2.91 | 2      | P-TTA025015        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 2°    | 3.05 | 2      | P-TTA025020        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 2°30" | 3.2  | 2      | P-TTA025025        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 3°    | 3.33 | 2      | P-TTA025030        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 4              | 5°    | 3.9  | 2      | P-TTA025050        | .01        | .02   | .03   |  |
| 2.5          | 8            | 50          | 6              | 7°    | 4.46 | 2      | P-TTA025070        | .01        | .02   | .03   |  |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                      | ◎                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

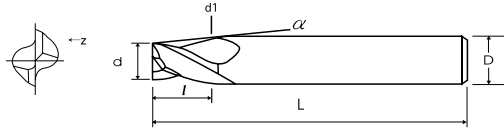
**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Square Type - 2 flutes ■ 2刃斜度立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |      |        | Purchase Code 採購代碼 |            |       |       |  |
|--------------|--------------|-------------|----------------|-------|------|--------|--------------------|------------|-------|-------|--|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1   | Flutes | MODE               | Coating 塗層 |       |       |  |
| d 刃徑         | ℓ 刃長         | L 全長        | D 柄徑           |       | 大徑   | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |  |
| 2.5          | 8            | 50          | 6              | 10°   | 5.32 | 2      | P-TTA025100        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 30"   | 3.17 | 2      | P-TTA030005        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 1°    | 3.35 | 2      | P-TTA030010        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 1°30" | 3.52 | 2      | P-TTA030015        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 2°    | 3.69 | 2      | P-TTA030020        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 2°30" | 3.87 | 2      | P-TTA030025        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 3°    | 4.05 | 2      | P-TTA030030        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 5°    | 4.75 | 2      | P-TTA030050        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 7°    | 5.46 | 2      | P-TTA030070        | .01        | .02   | .03   |  |
| 3            | 10           | 50          | 6              | 10°   | 6    | 2      | P-TTA030100        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 30"   | 4.26 | 2      | P-TTA040005        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 1°    | 4.52 | 2      | P-TTA040010        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 1°30" | 4.79 | 2      | P-TTA040015        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 2°    | 5.04 | 2      | P-TTA040020        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 2°30" | 5.31 | 2      | P-TTA040025        | .01        | .02   | .03   |  |
| 4            | 15           | 50          | 6              | 3°    | 5.57 | 2      | P-TTA040030        | .01        | .02   | .03   |  |
| 4            | 15           | 60          | 8              | 5°    | 6.62 | 2      | P-TTA040050        | .01        | .02   | .03   |  |
| 4            | 15           | 60          | 8              | 7°    | 7.68 | 2      | P-TTA040070        | .01        | .02   | .03   |  |
| 5            | 20           | 60          | 6              | 30"   | 5.34 | 2      | P-TTA050005        | .01        | .02   | .03   |  |
| 5            | 20           | 60          | 6              | 1°    | 5.7  | 2      | P-TTA050010        | .01        | .02   | .03   |  |
| 5            | 20           | 60          | 6              | 1°30" | 6    | 2      | P-TTA050015        | .01        | .02   | .03   |  |
| 5            | 20           | 60          | 8              | 2°    | 6.39 | 2      | P-TTA050020        | .01        | .02   | .03   |  |
| 5            | 20           | 60          | 8              | 2°30" | 6.74 | 2      | P-TTA050025        | .01        | .02   | .03   |  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                      | ○                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                      | ◎                  | ○      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                      | ○                  | ○      |        |        | ○ | ○                   |                    |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Square Type - 2 flutes

### 2刃斜度立銑刀

**600 PLUS**

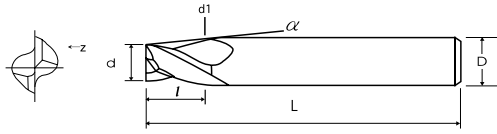
**HRC > 55**

**35°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |       |        | Purchase Code 採購代碼 |            |       |       |  |
|--------------|--------------|-------------|----------------|-------|-------|--------|--------------------|------------|-------|-------|--|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1    | Flutes | MODE               | Coating 塗層 |       |       |  |
| d 刃徑         | ℓ 刃長         | L 全長        | D 柄徑           |       | 大徑    | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |  |
| 5            | 20           | 60          | 8              | 3°    | 7.1   | 2      | P-TTA050030        | .01        | .02   | .03   |  |
| 5            | 20           | 75          | 10             | 5°    | 8.5   | 2      | P-TTA050050        | .01        | .02   | .03   |  |
| 5            | 20           | 75          | 10             | 7°    | 9.91  | 2      | P-TTA050070        | .01        | .02   | .03   |  |
| 6            | 20           | 60          | 8              | 30"   | 6.35  | 2      | P-TTA060005        | .01        | .02   | .03   |  |
| 6            | 20           | 60          | 8              | 1°    | 6.7   | 2      | P-TTA060010        | .01        | .02   | .03   |  |
| 6            | 20           | 60          | 8              | 1°30" | 7.05  | 2      | P-TTA060015        | .01        | .02   | .03   |  |
| 6            | 20           | 60          | 8              | 2°    | 7.4   | 2      | P-TTA060020        | .01        | .02   | .03   |  |
| 6            | 20           | 60          | 8              | 2°30" | 7.75  | 2      | P-TTA060025        | .01        | .02   | .03   |  |
| 6            | 19           | 60          | 8              | 3°    | 7.99  | 2      | P-TTA060030        | .01        | .02   | .03   |  |
| 6            | 20           | 75          | 10             | 5°    | 9.5   | 2      | P-TTA060050        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 10             | 30"   | 8.44  | 2      | P-TTA080005        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 10             | 1°    | 8.87  | 2      | P-TTA080010        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 10             | 1°30" | 9.31  | 2      | P-TTA080015        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 10             | 2°    | 9.74  | 2      | P-TTA080020        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 12             | 2°30" | 10.18 | 2      | P-TTA080025        | .01        | .02   | .03   |  |
| 8            | 25           | 75          | 12             | 3°    | 10.62 | 2      | P-TTA080030        | .01        | .02   | .03   |  |
| 8            | 22           | 100         | 12             | 5°    | 11.8  | 2      | P-TTA080050        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 12             | 30"   | 10.61 | 2      | P-TTA100005        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 12             | 1°    | 11.22 | 2      | P-TTA100010        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 12             | 1°30" | 11.83 | 2      | P-TTA100015        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 12             | 2°    | 11.96 | 2      | P-TTA100020        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 16             | 2°30" | 13.06 | 2      | P-TTA100025        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 16             | 3°    | 13.67 | 2      | P-TTA100030        | .01        | .02   | .03   |  |
| 10           | 35           | 100         | 16             | 5°    | 16.12 | 2      | P-TTA100050        | .01        | .02   | .03   |  |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                      | ○                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                      | ◎                  | ○      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                      | ○                  | ○      |        |        | ○ | ○                   |                    |                           |                     |                    |

Unit/單位: mm

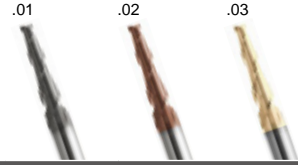
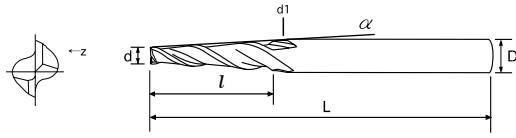
**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Type - Long flute - 2 flutes ■ 2刃長刃斜度立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |      |        | Purchase Code 採購代碼 |            |       |       |  |
|--------------|--------------|-------------|----------------|-------|------|--------|--------------------|------------|-------|-------|--|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1   | Flutes | MODE               | Coating 塗層 |       |       |  |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           |       | 大徑   | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |  |
| 1            | 10           | 50          | 4              | 30"   | 1.17 | 2      | P-LTTA010005       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 1°    | 1.35 | 2      | P-LTTA010010       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 1°30" | 1.52 | 2      | P-LTTA010015       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 2°    | 1.7  | 2      | P-LTTA010020       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 2°30" | 1.87 | 2      | P-LTTA010025       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 3°    | 2.05 | 2      | P-LTTA010030       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 5°    | 2.74 | 2      | P-LTTA010050       | .01        | .02   | .03   |  |
| 1            | 10           | 50          | 4              | 7°    | 3.44 | 2      | P-LTTA010070       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 30"   | 1.67 | 2      | P-LTTA015005       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 1°    | 1.85 | 2      | P-LTTA015010       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 1°30" | 2.02 | 2      | P-LTTA015015       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 2°    | 2.2  | 2      | P-LTTA015020       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 2°30" | 2.37 | 2      | P-LTTA015025       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 3°    | 2.55 | 2      | P-LTTA015030       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 5°    | 3.24 | 2      | P-LTTA015050       | .01        | .02   | .03   |  |
| 1.5          | 10           | 50          | 4              | 7°    | 3.94 | 2      | P-LTTA015070       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 30"   | 2.22 | 2      | P-LTTA020005       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 1°    | 2.45 | 2      | P-LTTA020010       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 1°30" | 2.68 | 2      | P-LTTA020015       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 2°    | 2.9  | 2      | P-LTTA020020       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 2°30" | 3.13 | 2      | P-LTTA020025       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 4              | 3°    | 3.36 | 2      | P-LTTA020030       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 6              | 5°    | 4.27 | 2      | P-LTTA020050       | .01        | .02   | .03   |  |
| 2            | 13           | 50          | 6              | 7°    | 5.17 | 2      | P-LTTA020070       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 4              | 30"   | 2.76 | 2      | P-LTTA025005       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 4              | 1°    | 3.03 | 2      | P-LTTA025010       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 4              | 1°30" | 3.29 | 2      | P-LTTA025015       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 4              | 2°    | 3.56 | 2      | P-LTTA025020       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 4              | 2°30" | 3.81 | 2      | P-LTTA025025       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 6              | 3°    | 4.07 | 2      | P-LTTA025030       | .01        | .02   | .03   |  |
| 2.5          | 15           | 50          | 6              | 5°    | 5.13 | 2      | P-LTTA025050       | .01        | .02   | .03   |  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                    | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                    | ◎                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                    | ○                  | ○      |        |        | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P346**  
Cutting Condition

## Taper Type - Long flute - 2 flutes

### ■ 2刃長刃斜度立銑刀

**600 PLUS**

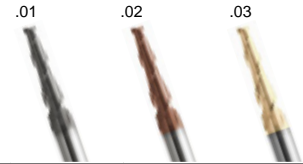
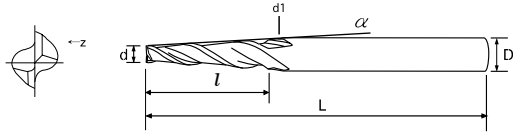
**HRC > 55**

**35°**

$\alpha$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |              |             |                |       |       |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|-------|-------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | α     | d1    | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           |       | 大徑    | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |
| 3            | 20           | 60          | 6              | 30"   | 3.35  | 2      | P-LTTA030005       | .01        | .02   | .03   |
| 3            | 20           | 60          | 6              | 1°    | 3.7   | 2      | P-LTTA030010       | .01        | .02   | .03   |
| 3            | 20           | 60          | 6              | 1°30" | 4.05  | 2      | P-LTTA030015       | .01        | .02   | .03   |
| 3            | 20           | 60          | 6              | 2°    | 4.39  | 2      | P-LTTA030020       | .01        | .02   | .03   |
| 3            | 20           | 60          | 6              | 2°30" | 4.65  | 2      | P-LTTA030025       | .01        | .02   | .03   |
| 3            | 20           | 60          | 6              | 3°    | 5.1   | 2      | P-LTTA030030       | .01        | .02   | .03   |
| 3            | 20           | 60          | 8              | 5°    | 6.5   | 2      | P-LTTA030050       | .01        | .02   | .03   |
| 4            | 25           | 60          | 6              | 30"   | 4.44  | 2      | P-LTTA040005       | .01        | .02   | .03   |
| 4            | 25           | 60          | 6              | 1°    | 4.88  | 2      | P-LTTA040010       | .01        | .02   | .03   |
| 4            | 25           | 60          | 6              | 1°30" | 5.13  | 2      | P-LTTA040015       | .01        | .02   | .03   |
| 4            | 25           | 60          | 6              | 2°    | 5.75  | 2      | P-LTTA040020       | .01        | .02   | .03   |
| 4            | 25           | 60          | 8              | 2°30" | 6.19  | 2      | P-LTTA040025       | .01        | .02   | .03   |
| 4            | 25           | 60          | 8              | 3°    | 6.62  | 2      | P-LTTA040030       | .01        | .02   | .03   |
| 4            | 25           | 75          | 10             | 5°    | 8.38  | 2      | P-LTTA040050       | .01        | .02   | .03   |
| 5            | 30           | 75          | 6              | 30"   | 5.52  | 2      | P-LTTA050005       | .01        | .02   | .03   |
| 5            | 30           | 75          | 8              | 1°    | 6.05  | 2      | P-LTTA050010       | .01        | .02   | .03   |
| 5            | 30           | 75          | 8              | 1°30" | 6.57  | 2      | P-LTTA050015       | .01        | .02   | .03   |
| 5            | 30           | 75          | 8              | 2°    | 7.09  | 2      | P-LTTA050020       | .01        | .02   | .03   |
| 5            | 30           | 75          | 8              | 2°30" | 7.62  | 2      | P-LTTA050025       | .01        | .02   | .03   |
| 5            | 30           | 75          | 10             | 3°    | 8.14  | 2      | P-LTTA050030       | .01        | .02   | .03   |
| 5            | 30           | 75          | 12             | 5°    | 10.25 | 2      | P-LTTA050050       | .01        | .02   | .03   |
| 6            | 35           | 75          | 8              | 30"   | 6.61  | 2      | P-LTTA060005       | .01        | .02   | .03   |
| 6            | 35           | 75          | 8              | 1°    | 7.22  | 2      | P-LTTA060010       | .01        | .02   | .03   |
| 6            | 35           | 75          | 8              | 1°30" | 7.83  | 2      | P-LTTA060015       | .01        | .02   | .03   |
| 6            | 35           | 75          | 10             | 2°    | 8.44  | 2      | P-LTTA060020       | .01        | .02   | .03   |
| 6            | 35           | 100         | 10             | 2°30" | 9.05  | 2      | P-LTTA060025       | .01        | .02   | .03   |
| 6            | 35           | 100         | 10             | 3°    | 9.67  | 2      | P-LTTA060030       | .01        | .02   | .03   |
| 6            | 34           | 100         | 12             | 5°    | 11.95 | 2      | P-LTTA060050       | .01        | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ◎                      | ◎                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ○                                  | ◎                      | ○                  | ○      |        |        | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 P347-348  
Cutting Condition

## Miniature Ball Nose Type - 2 flutes

### 2刃微小徑球型立銑刀

600 PLUS

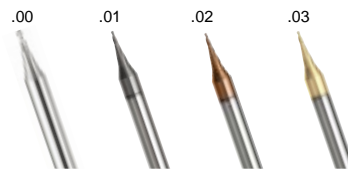
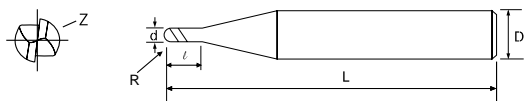
HRC > 40

35°

a/b  
b>a

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刀徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 0.3          | 0.15   | 0.6          | 50          | 4              | 2      | P-MIB0032          | .00        | .01    | .02   | .03   |
| 0.4          | 0.2    | 0.8          | 50          | 4              | 2      | P-MIB0042          | .00        | .01    | .02   | .03   |
| 0.5          | 0.25   | 1            | 50          | 4              | 2      | P-MIB0052          | .00        | .01    | .02   | .03   |
| 0.6          | 0.3    | 1.2          | 50          | 4              | 2      | P-MIB0062          | .00        | .01    | .02   | .03   |
| 0.7          | 0.35   | 1.4          | 50          | 4              | 2      | P-MIB0072          | .00        | .01    | .02   | .03   |
| 0.8          | 0.4    | 1.6          | 50          | 4              | 2      | P-MIB0082          | .00        | .01    | .02   | .03   |
| 0.9          | 0.45   | 1.8          | 50          | 4              | 2      | P-MIB0092          | .00        | .01    | .02   | .03   |
| 1            | 0.5    | 2            | 50          | 4              | 2      | P-MIB0102          | .00        | .01    | .02   | .03   |
| 1.1          | 0.55   | 2.2          | 50          | 4              | 2      | P-MIB0112          | .00        | .01    | .02   | .03   |
| 1.2          | 0.6    | 2.4          | 50          | 4              | 2      | P-MIB0122          | .00        | .01    | .02   | .03   |
| 1.3          | 0.65   | 2.6          | 50          | 4              | 2      | P-MIB0132          | .00        | .01    | .02   | .03   |
| 1.4          | 0.7    | 2.8          | 50          | 4              | 2      | P-MIB0142          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 4              | 2      | P-MIB0152          | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 3.2          | 50          | 4              | 2      | P-MIB0162          | .00        | .01    | .02   | .03   |
| 1.7          | 0.85   | 3.4          | 50          | 4              | 2      | P-MIB0172          | .00        | .01    | .02   | .03   |
| 1.8          | 0.9    | 3.6          | 50          | 4              | 2      | P-MIB0182          | .00        | .01    | .02   | .03   |
| 1.9          | 0.95   | 3.8          | 50          | 4              | 2      | P-MIB0192          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 4              | 2      | P-MIB0202          | .00        | .01    | .02   | .03   |
| 2.1          | 1.05   | 4.2          | 50          | 4              | 2      | P-MIB0212          | .00        | .01    | .02   | .03   |
| 2.2          | 1.1    | 4.4          | 50          | 4              | 2      | P-MIB0222          | .00        | .01    | .02   | .03   |
| 2.3          | 1.15   | 4.6          | 50          | 4              | 2      | P-MIB0232          | .00        | .01    | .02   | .03   |
| 2.4          | 1.2    | 4.8          | 50          | 4              | 2      | P-MIB0242          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 4              | 2      | P-MIB0252          | .00        | .01    | .02   | .03   |
| 2.6          | 1.3    | 5.2          | 50          | 4              | 2      | P-MIB0262          | .00        | .01    | .02   | .03   |
| 2.7          | 1.35   | 5.4          | 50          | 4              | 2      | P-MIB0272          | .00        | .01    | .02   | .03   |
| 2.8          | 1.4    | 5.6          | 50          | 4              | 2      | P-MIB0282          | .00        | .01    | .02   | .03   |
| 2.9          | 1.45   | 5.8          | 50          | 4              | 2      | P-MIB0292          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 4              | 2      | P-MIB0302          | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ◎                  | ○      |        |        | ◎                   | ○                  |                           |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P349**  
Cutting Condition

## Ball Nose Type - 2 flutes 2刃球型立銑刀

**600 PLUS**

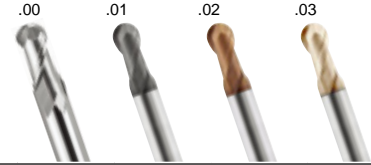
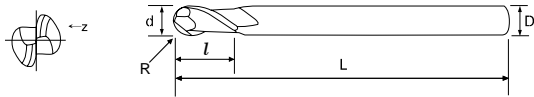
**HRC > 45**

**35°**

**a/b > a**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1            | 0.5    | 2            | 50          | 3              | 2      | P-SSB0102          | .00        | .01    | .02   | .03   |
| 1            | 0.5    | 2            | 50          | 4              | 2      | P-MSB0102          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 3              | 2      | P-SSB0152          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 4              | 2      | P-MSB0152          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 3              | 2      | P-SSB0202          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 4              | 2      | P-MSB0202          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 3              | 2      | P-SSB0252          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 4              | 2      | P-MSB0252          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 3              | 2      | P-SSB0302          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 4              | 2      | P-MSB0302          | .00        | .01    | .02   | .03   |
| 3.5          | 1.75   | 7            | 50          | 4              | 2      | P-MSB0352          | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 50          | 4              | 2      | P-MSB0402          | .00        | .01    | .02   | .03   |
| 1            | 0.5    | 2            | 50          | 6              | 2      | P-SB0102           | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 6              | 2      | P-SB0152           | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 6              | 2      | P-SB0202           | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 6              | 2      | P-SB0252           | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 6              | 2      | P-SB0302           | .00        | .01    | .02   | .03   |
| 3.5          | 1.75   | 7            | 50          | 6              | 2      | P-SB0352           | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 50          | 6              | 2      | P-SB0402           | .00        | .01    | .02   | .03   |
| 4.5          | 2.25   | 9            | 50          | 6              | 2      | P-SB0452           | .00        | .01    | .02   | .03   |
| 5            | 2.5    | 10           | 50          | 6              | 2      | P-SB0502           | .00        | .01    | .02   | .03   |
| 5.5          | 2.75   | 11           | 50          | 6              | 2      | P-SB0552           | .00        | .01    | .02   | .03   |
| 6            | 3      | 12           | 50          | 6              | 2      | P-SB0602           | .00        | .01    | .02   | .03   |
| 7            | 3.5    | 14           | 60          | 8              | 2      | P-SB0702           | .00        | .01    | .02   | .03   |
| 8            | 4      | 16           | 60          | 8              | 2      | P-SB0802           | .00        | .01    | .02   | .03   |
| 9            | 4.5    | 18           | 75          | 10             | 2      | P-SB0902           | .00        | .01    | .02   | .03   |
| 10           | 5      | 20           | 75          | 10             | 2      | P-SB1002           | .00        | .01    | .02   | .03   |
| 11           | 5.5    | 22           | 75          | 12             | 2      | P-SB1102           | .00        | .01    | .02   | .03   |
| 12           | 6      | 24           | 75          | 12             | 2      | P-SB1202           | .00        | .01    | .02   | .03   |
| 14           | 7      | 28           | 100         | 16             | 2      | P-SB1402           | .00        | .01    | .02   | .03   |
| 16           | 8      | 32           | 100         | 16             | 2      | P-SB1602           | .00        | .01    | .02   | .03   |
| 18           | 9      | 36           | 100         | 20             | 2      | P-SB1802           | .00        | .01    | .02   | .03   |
| 20           | 10     | 40           | 100         | 20             | 2      | P-SB2002           | .00        | .01    | .02   | .03   |

**R** High precision radius accuracy request is available  
高精度R值可訂製

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                      | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P350**  
Cutting Condition

## Ball Nose Type - 4 flutes 4刃球型立銑刀

**600 PLUS**

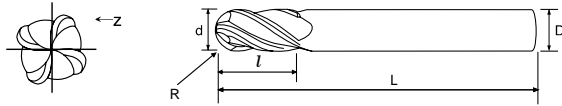
**HRC > 45**

**35°**

$a < \frac{1}{2}b$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1            | 0.5    | 2            | 50          | 4              | 4      | P-MSB0104          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 4              | 4      | P-MSB0154          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 4              | 4      | P-MSB0204          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 4              | 4      | P-MSB0254          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 3              | 4      | P-SSB0304          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 4              | 4      | P-MSB0304          | .00        | .01    | .02   | .03   |
| 3.5          | 1.75   | 7            | 50          | 4              | 4      | P-MSB0354          | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 50          | 4              | 4      | P-MSB0404          | .00        | .01    | .02   | .03   |
| 1            | 0.5    | 2            | 50          | 6              | 4      | P-SB0104           | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 50          | 6              | 4      | P-SB0154           | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 50          | 6              | 4      | P-SB0204           | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 50          | 6              | 4      | P-SB0254           | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 50          | 6              | 4      | P-SB0304           | .00        | .01    | .02   | .03   |
| 3.5          | 1.75   | 7            | 50          | 6              | 4      | P-SB0354           | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 50          | 6              | 4      | P-SB0404           | .00        | .01    | .02   | .03   |
| 4.5          | 2.25   | 9            | 50          | 6              | 4      | P-SB0454           | .00        | .01    | .02   | .03   |
| 5            | 2.5    | 10           | 50          | 6              | 4      | P-SB0504           | .00        | .01    | .02   | .03   |
| 5.5          | 2.75   | 11           | 50          | 6              | 4      | P-SB0554           | .00        | .01    | .02   | .03   |
| 6            | 3      | 12           | 50          | 6              | 4      | P-SB0604           | .00        | .01    | .02   | .03   |
| 7            | 3.5    | 14           | 60          | 8              | 4      | P-SB0704           | .00        | .01    | .02   | .03   |
| 8            | 4      | 16           | 60          | 8              | 4      | P-SB0804           | .00        | .01    | .02   | .03   |
| 9            | 4.5    | 18           | 75          | 10             | 4      | P-SB0904           | .00        | .01    | .02   | .03   |
| 10           | 5      | 20           | 75          | 10             | 4      | P-SB1004           | .00        | .01    | .02   | .03   |
| 11           | 5.5    | 22           | 75          | 12             | 4      | P-SB1104           | .00        | .01    | .02   | .03   |
| 12           | 6      | 24           | 75          | 12             | 4      | P-SB1204           | .00        | .01    | .02   | .03   |
| 14           | 7      | 28           | 100         | 16             | 4      | P-SB1404           | .00        | .01    | .02   | .03   |
| 16           | 8      | 32           | 100         | 16             | 4      | P-SB1604           | .00        | .01    | .02   | .03   |
| 18           | 9      | 36           | 100         | 20             | 4      | P-SB1804           | .00        | .01    | .02   | .03   |
| 20           | 10     | 40           | 100         | 20             | 4      | P-SB2004           | .00        | .01    | .02   | .03   |

**R** High precision radius accuracy request is available  
±0.003 高精度R值可訂製

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                      | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ◎      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 P347-348  
Cutting Condition

## Ball Nose Type - Long Shank - 2 flutes

### 2刃長柄球型立銑刀

600 PLUS

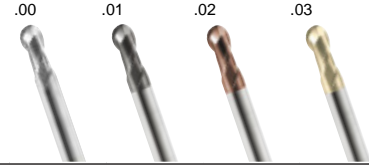
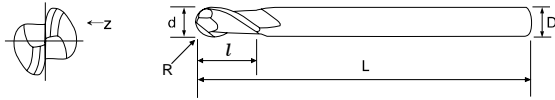
HRC > 45

35°

$a < b$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1            | 0.5    | 2            | 75          | 6              | 2      | P-SLB0102          | .00        | .01    | .02   | .03   |
| 1            | 0.5    | 2            | 100         | 6              | 2      | P-MLB0102          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 75          | 6              | 2      | P-SLB0152          | .00        | .01    | .02   | .03   |
| 1.5          | 0.75   | 3            | 100         | 6              | 2      | P-MLB0152          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 75          | 6              | 2      | P-SLB0202          | .00        | .01    | .02   | .03   |
| 2            | 1      | 4            | 100         | 6              | 2      | P-MLB0202          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 75          | 6              | 2      | P-SLB0252          | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 5            | 100         | 6              | 2      | P-MLB0252          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 75          | 6              | 2      | P-SLB0302          | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 6            | 100         | 6              | 2      | P-MLB0302          | .00        | .01    | .02   | .03   |
| 3.5          | 1.75   | 7            | 100         | 6              | 2      | P-MLB0352          | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 75          | 6              | 2      | P-SLB0402          | .00        | .01    | .02   | .03   |
| 4            | 2      | 8            | 100         | 6              | 2      | P-MLB0402          | .00        | .01    | .02   | .03   |
| 5            | 2.5    | 10           | 75          | 6              | 2      | P-SLB0502          | .00        | .01    | .02   | .03   |
| 5            | 2.5    | 10           | 100         | 6              | 2      | P-MLB0502          | .00        | .01    | .02   | .03   |
| 6            | 3      | 12           | 75          | 6              | 2      | P-SLB0602          | .00        | .01    | .02   | .03   |
| 6            | 3      | 12           | 100         | 6              | 2      | P-MLB0602          | .00        | .01    | .02   | .03   |
| 6            | 3      | 12           | 150         | 6              | 2      | P-LLB0602          | .00        | .01    | .02   | .03   |
| 8            | 4      | 16           | 75          | 8              | 2      | P-SLB0802          | .00        | .01    | .02   | .03   |
| 8            | 4      | 16           | 100         | 8              | 2      | P-MLB0802          | .00        | .01    | .02   | .03   |
| 8            | 4      | 16           | 150         | 8              | 2      | P-LLB0802          | .00        | .01    | .02   | .03   |
| 10           | 5      | 20           | 100         | 10             | 2      | P-MLB1002          | .00        | .01    | .02   | .03   |
| 10           | 5      | 20           | 150         | 10             | 2      | P-LLB1002          | .00        | .01    | .02   | .03   |
| 10           | 5      | 20           | 200         | 10             | 2      | P-XLB1002          | .00        | .01    | .02   | .03   |
| 12           | 6      | 24           | 100         | 12             | 2      | P-MLB1202          | .00        | .01    | .02   | .03   |
| 12           | 6      | 24           | 150         | 12             | 2      | P-LLB1202          | .00        | .01    | .02   | .03   |
| 12           | 6      | 24           | 200         | 12             | 2      | P-XLB1202          | .00        | .01    | .02   | .03   |
| 16           | 8      | 32           | 150         | 16             | 2      | P-LLB1602          | .00        | .01    | .02   | .03   |
| 16           | 8      | 32           | 200         | 16             | 2      | P-XLB1602          | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTiBN     | ◎                                  | ◎                    | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P351**  
Cutting Condition

## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀

**600 PLUS**

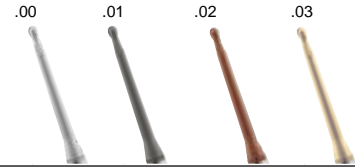
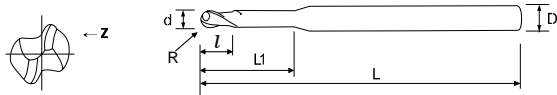
**HRC > 45**

**35°**

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 0.5          | 0.25   | 0.75         | 2                | 50          | 4              | 2      | P-LNBT05022        | .00        | .01   | .02   | .03 |
| 0.5          | 0.25   | 0.75         | 4                | 50          | 4              | 2      | P-LNBT05042        | .00        | .01   | .02   | .03 |
| 0.5          | 0.25   | 0.75         | 6                | 50          | 4              | 2      | P-LNBT05062        | .00        | .01   | .02   | .03 |
| 0.6          | 0.3    | 0.9          | 2                | 50          | 4              | 2      | P-LNBT06022        | .00        | .01   | .02   | .03 |
| 0.6          | 0.3    | 0.9          | 4                | 50          | 4              | 2      | P-LNBT06042        | .00        | .01   | .02   | .03 |
| 0.6          | 0.3    | 0.9          | 6                | 50          | 4              | 2      | P-LNBT06062        | .00        | .01   | .02   | .03 |
| 0.8          | 0.4    | 1.2          | 4                | 50          | 4              | 2      | P-LNBT08042        | .00        | .01   | .02   | .03 |
| 0.8          | 0.4    | 1.2          | 6                | 50          | 4              | 2      | P-LNBT08062        | .00        | .01   | .02   | .03 |
| 0.8          | 0.4    | 1.2          | 8                | 50          | 4              | 2      | P-LNBT08082        | .00        | .01   | .02   | .03 |
| 1            | 0.5    | 1.5          | 6                | 50          | 4              | 2      | P-LNBT10062        | .00        | .01   | .02   | .03 |
| 1            | 0.5    | 1.5          | 8                | 50          | 4              | 2      | P-LNBT10082        | .00        | .01   | .02   | .03 |
| 1            | 0.5    | 1.5          | 10               | 50          | 4              | 2      | P-LNBT10102        | .00        | .01   | .02   | .03 |
| 1            | 0.5    | 1.5          | 12               | 50          | 4              | 2      | P-LNBT10122        | .00        | .01   | .02   | .03 |
| 1.2          | 0.6    | 1.8          | 6                | 50          | 4              | 2      | P-LNBT12062        | .00        | .01   | .02   | .03 |
| 1.2          | 0.6    | 1.8          | 8                | 50          | 4              | 2      | P-LNBT12082        | .00        | .01   | .02   | .03 |
| 1.2          | 0.6    | 1.8          | 10               | 50          | 4              | 2      | P-LNBT12102        | .00        | .01   | .02   | .03 |
| 1.2          | 0.6    | 1.8          | 12               | 50          | 4              | 2      | P-LNBT12122        | .00        | .01   | .02   | .03 |
| 1.4          | 0.7    | 2.1          | 6                | 50          | 4              | 2      | P-LNBT14062        | .00        | .01   | .02   | .03 |
| 1.4          | 0.7    | 2.1          | 10               | 50          | 4              | 2      | P-LNBT14102        | .00        | .01   | .02   | .03 |
| 1.4          | 0.7    | 2.1          | 16               | 50          | 4              | 2      | P-LNBT14162        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 6                | 50          | 4              | 2      | P-LNBT15062        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 8                | 50          | 4              | 2      | P-LNBT15082        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 10               | 50          | 4              | 2      | P-LNBT15102        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 12               | 50          | 4              | 2      | P-LNBT15122        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 14               | 50          | 4              | 2      | P-LNBT15142        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 16               | 50          | 4              | 2      | P-LNBT15162        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 18               | 50          | 4              | 2      | P-LNBT15182        | .00        | .01   | .02   | .03 |
| 1.5          | 0.75   | 2.3          | 20               | 50          | 4              | 2      | P-LNBT15202        | .00        | .01   | .02   | .03 |
| 1.6          | 0.8    | 2.4          | 6                | 50          | 4              | 2      | P-LNBT16062        | .00        | .01   | .02   | .03 |
| 1.6          | 0.8    | 2.4          | 8                | 50          | 4              | 2      | P-LNBT16082        | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P351**  
Cutting Condition

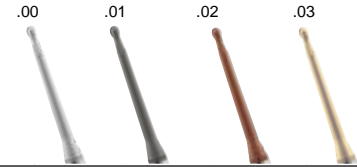
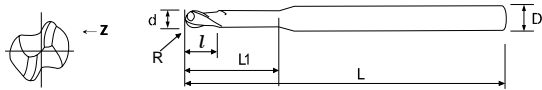
## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTiBN | TiSiN | ZrN-A |
| 1.6          | 0.8    | 2.4          | 10               | 50          | 4              | 2      | P-LNBT16102        | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 2.4          | 12               | 50          | 4              | 2      | P-LNBT16122        | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 2.4          | 14               | 50          | 4              | 2      | P-LNBT16142        | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 2.4          | 16               | 50          | 4              | 2      | P-LNBT16162        | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 2.4          | 18               | 50          | 4              | 2      | P-LNBT16182        | .00        | .01    | .02   | .03   |
| 1.6          | 0.8    | 2.4          | 20               | 50          | 4              | 2      | P-LNBT16202        | .00        | .01    | .02   | .03   |
| 1.8          | 0.9    | 2.7          | 8                | 50          | 4              | 2      | P-LNBT18082        | .00        | .01    | .02   | .03   |
| 1.8          | 0.9    | 2.7          | 14               | 50          | 4              | 2      | P-LNBT18142        | .00        | .01    | .02   | .03   |
| 1.8          | 0.9    | 2.7          | 20               | 50          | 4              | 2      | P-LNBT18202        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 8                | 50          | 4              | 2      | P-LNBT20082        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 10               | 50          | 4              | 2      | P-LNBT20102        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 12               | 50          | 4              | 2      | P-LNBT20122        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 14               | 50          | 4              | 2      | P-LNBT20142        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 16               | 50          | 4              | 2      | P-LNBT20162        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 18               | 50          | 4              | 2      | P-LNBT20182        | .00        | .01    | .02   | .03   |
| 2            | 1      | 3            | 20               | 50          | 4              | 2      | P-LNBT20202        | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 4            | 8                | 50          | 4              | 2      | P-LNBT25082        | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 4            | 12               | 50          | 4              | 2      | P-LNBT25122        | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 4            | 16               | 50          | 4              | 2      | P-LNBT25162        | .00        | .01    | .02   | .03   |
| 2.5          | 1.25   | 4            | 20               | 50          | 4              | 2      | P-LNBT25202        | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 4.5          | 10               | 50          | 6              | 2      | P-LNBT30102        | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 4.5          | 12               | 50          | 6              | 2      | P-LNBT30122        | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 4.5          | 16               | 60          | 6              | 2      | P-LNBT30162        | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 4.5          | 20               | 60          | 6              | 2      | P-LNBT30202        | .00        | .01    | .02   | .03   |
| 3            | 1.5    | 4.5          | 25               | 75          | 6              | 2      | P-LNBT30252        | .00        | .01    | .02   | .03   |
| 4            | 2      | 6            | 12               | 50          | 6              | 2      | P-LNBT40122        | .00        | .01    | .02   | .03   |
| 4            | 2      | 6            | 16               | 60          | 6              | 2      | P-LNBT40162        | .00        | .01    | .02   | .03   |
| 4            | 2      | 6            | 20               | 75          | 6              | 2      | P-LNBT40202        | .00        | .01    | .02   | .03   |
| 4            | 2      | 6            | 25               | 75          | 6              | 2      | P-LNBT40252        | .00        | .01    | .02   | .03   |
| 4            | 2      | 6            | 30               | 75          | 6              | 2      | P-LNBT40302        | .00        | .01    | .02   | .03   |

Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                      | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTiBN     | ◎                                  | ◎                    | ○                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ○      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm



**600<sup>+</sup>** 切削條件表 **P352**  
Cutting Condition

### Pencil Neck Ball Nose Type - 2 flutes

## 2刃斜頸球型銑刀

600 PLUS

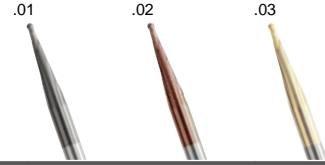
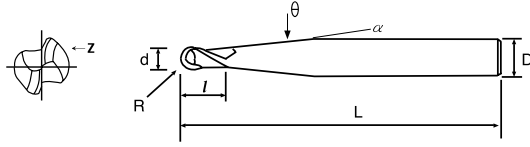
HRC 55

35°

$a > b$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |       |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|-------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Bevel | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | 刃長           | L 全長        | D 柄徑           | θ 斜度  | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |
| 1            | 0.5    | 2            | 75          | 6              | 1°    | 2      | P-PBTA0101         | .01        | .02   | .03   |
| 1.5          | 0.75   | 3            | 75          | 6              | 1°    | 2      | P-PBTA0151         | .01        | .02   | .03   |
| 2            | 1      | 4            | 75          | 6              | 1°    | 2      | P-PBTA0201         | .01        | .02   | .03   |
| 2            | 1      | 12           | 100         | 8              | 5°    | 2      | P-PBTA0205         | .01        | .02   | .03   |
| 3            | 1.5    | 6            | 75          | 6              | 1°    | 2      | P-PBTA0301         | .01        | .02   | .03   |
| 3            | 1.5    | 8            | 100         | 8              | 5°    | 2      | P-PBTA0305         | .01        | .02   | .03   |
| 4            | 2      | 8            | 75          | 6              | 1°    | 2      | P-PBTA0401         | .01        | .02   | .03   |
| 4            | 2      | 10           | 100         | 8              | 5°    | 2      | P-PBTA0405         | .01        | .02   | .03   |
| 6            | 3      | 12           | 100         | 10             | 5°    | 2      | P-PBTA0605         | .01        | .02   | .03   |
| 6            | 3      | 16           | 150         | 12             | 3°    | 2      | P-PBTA0603         | .01        | .02   | .03   |
| 8            | 4      | 16           | 100         | 12             | 5°    | 2      | P-PBTA0805         | .01        | .02   | .03   |
| 8            | 4      | 20           | 150         | 12             | 3°    | 2      | P-PBTA0803         | .01        | .02   | .03   |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

**600<sup>+</sup>** 切削條件表 **P352**  
Cutting Condition

## Taper Ball Nose Type - 2 flutes

### 2 刃斜度球型立銑刀

**600 PLUS**

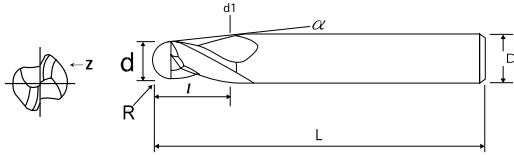
**HRC ▶ 55**

**35°**

$\alpha$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |      |        |      | Purchase Code 採購代碼 |      |     |        |
|--------------|--------|--------------|-------------|----------------|------|--------|------|--------------------|------|-----|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | d1   | Flutes | MODE | Coating 塗層         |      |     |        |
| d 刃徑         | R 值    | 刃長           | L 全長        | D 柄徑           | 大徑   |        |      | α                  | Z 刃數 | 型號  | ALTiBN |
| 1            | 0.5    | 10           | 50          | 4              | 1.17 | 30"    | 2    | P-TBTA050005       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 1.35 | 1°     | 2    | P-TBTA050010       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 1.52 | 1°30"  | 2    | P-TBTA050015       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 1.7  | 2°     | 2    | P-TBTA050020       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 1.87 | 3°     | 2    | P-TBTA050030       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 2.05 | 4°     | 2    | P-TBTA050040       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 2.74 | 5°     | 2    | P-TBTA050050       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 3.44 | 7°     | 2    | P-TBTA050070       | .01  | .02 | .03    |
| 1            | 0.5    | 10           | 50          | 4              | 4.51 | 10°    | 2    | P-TBTA050100       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 1.67 | 30"    | 2    | P-TBTA075005       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 1.85 | 1°     | 2    | P-TBTA075010       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 2.02 | 1°30"  | 2    | P-TBTA075015       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 2.2  | 2°     | 2    | P-TBTA075020       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 2.37 | 3°     | 2    | P-TBTA075030       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 2.55 | 4°     | 2    | P-TBTA075040       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 3.24 | 5°     | 2    | P-TBTA075050       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 4              | 3.94 | 7°     | 2    | P-TBTA075070       | .01  | .02 | .03    |
| 1.5          | 0.75   | 10           | 50          | 6              | 5.02 | 10°    | 2    | P-TBTA075100       | .01  | .02 | .03    |
| 2            | 1      | 13           | 50          | 4              | 2.22 | 30"    | 2    | P-TBTA100005       | .01  | .02 | .03    |
| 2            | 1      | 13           | 50          | 4              | 2.45 | 1°     | 2    | P-TBTA100010       | .01  | .02 | .03    |
| 2            | 1      | 13           | 50          | 4              | 2.68 | 1°30"  | 2    | P-TBTA100015       | .01  | .02 | .03    |
| 2            | 1      | 13           | 50          | 4              | 3.9  | 2°     | 2    | P-TBTA100020       | .01  | .02 | .03    |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

# 600<sup>+</sup>

切削條件表  
P352  
Cutting Condition

## Taper Ball Nose Type - 2 flutes

### 2 刃斜度球型立銑刀

600 PLUS

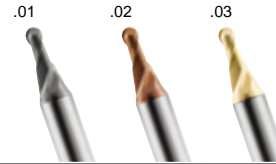
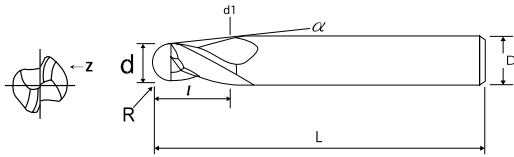
HRC 55

35°

$a < b$   
 $b > a$

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |       |        |      | Purchase Code 採購代碼 |        |       |       |
|--------------|--------|--------------|-------------|----------------|-------|--------|------|--------------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | d1    | Flutes | MODE | Coating 塗層         |        |       |       |
| d 刃徑         | R 值    | 刃長           | L 全長        | D 柄徑           | 大徑    |        |      | 型號                 | ALTiBN | TiSiN | ZrN-A |
| 2            | 1      | 13           | 50          | 4              | 3.13  | 3°     | 2    | P-TBTA100030       | .01    | .02   | .03   |
| 2            | 1      | 13           | 50          | 4              | 3.36  | 4°     | 2    | P-TBTA100040       | .01    | .02   | .03   |
| 2            | 1      | 13           | 50          | 6              | 4.27  | 5°     | 2    | P-TBTA100050       | .01    | .02   | .03   |
| 2            | 1      | 13           | 50          | 6              | 5.17  | 7°     | 2    | P-TBTA100070       | .01    | .02   | .03   |
| 2            | 1      | 13           | 60          | 8              | 6.56  | 10°    | 2    | P-TBTA100100       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 4              | 2.76  | 30"    | 2    | P-TBTA125005       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 4              | 3.03  | 1°     | 2    | P-TBTA125010       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 4              | 3.29  | 1°30"  | 2    | P-TBTA125015       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 4              | 3.56  | 2°     | 2    | P-TBTA125020       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 4              | 3.81  | 3°     | 2    | P-TBTA125030       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 6              | 4.07  | 4°     | 2    | P-TBTA125040       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 50          | 6              | 5.13  | 5°     | 2    | P-TBTA125050       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 60          | 6              | 6.17  | 7°     | 2    | P-TBTA125070       | .01    | .02   | .03   |
| 2.5          | 1.25   | 15           | 60          | 8              | 7.77  | 10°    | 2    | P-TBTA125100       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 50          | 4              | 3.34  | 30"    | 2    | P-TBTA150005       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 50          | 4              | 3.6   | 1°     | 2    | P-TBTA150010       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 6              | 4.04  | 1°30"  | 2    | P-TBTA150015       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 6              | 4.39  | 2°     | 2    | P-TBTA150020       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 6              | 5.08  | 3°     | 2    | P-TBTA150030       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 6              | 5.78  | 4°     | 2    | P-TBTA150040       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 8              | 6.48  | 5°     | 2    | P-TBTA150050       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 60          | 8              | 7.9   | 7°     | 2    | P-TBTA150070       | .01    | .02   | .03   |
| 3            | 1.5    | 20           | 75          | 10             | 10.04 | 10°    | 2    | P-TBTA150100       | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm



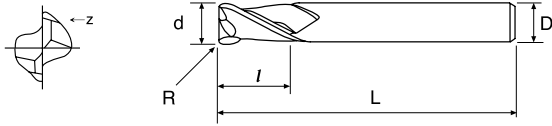
**600<sup>+</sup>** 切削條件表 **P353**  
Cutting Condition

## Corner Radius Type - 2 flutes ■ 2刃圓鼻立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 1            | 0.1    | 3            | 50          | 4              | 2      | P-RTA010012        | .00        | .01    | .02   | .03   |
| 1            | 0.2    | 3            | 50          | 4              | 2      | P-RTA010022        | .00        | .01    | .02   | .03   |
| 1            | 0.3    | 3            | 50          | 4              | 2      | P-RTA010032        | .00        | .01    | .02   | .03   |
| 1.5          | 0.2    | 4            | 50          | 4              | 2      | P-RTA015022        | .00        | .01    | .02   | .03   |
| 1.5          | 0.3    | 4            | 50          | 4              | 2      | P-RTA015032        | .00        | .01    | .02   | .03   |
| 2            | 0.2    | 6            | 50          | 4              | 2      | P-RTA020022        | .00        | .01    | .02   | .03   |
| 2            | 0.3    | 6            | 50          | 4              | 2      | P-RTA020032        | .00        | .01    | .02   | .03   |
| 2            | 0.5    | 6            | 50          | 4              | 2      | P-RTA020052        | .00        | .01    | .02   | .03   |
| 2.5          | 0.2    | 8            | 50          | 4              | 2      | P-RTA025022        | .00        | .01    | .02   | .03   |
| 3            | 0.2    | 8            | 50          | 3              | 2      | P-RTA030022        | .00        | .01    | .02   | .03   |
| 3            | 0.3    | 8            | 50          | 3              | 2      | P-RTA030032        | .00        | .01    | .02   | .03   |
| 3            | 0.5    | 8            | 50          | 3              | 2      | P-RTA030052        | .00        | .01    | .02   | .03   |
| 3            | 1      | 8            | 50          | 3              | 2      | P-RTA030102        | .00        | .01    | .02   | .03   |
| 3            | 0.2    | 8            | 50          | 4              | 2      | P-RTA430022        | .00        | .01    | .02   | .03   |
| 3            | 0.3    | 8            | 50          | 4              | 2      | P-RTA430032        | .00        | .01    | .02   | .03   |
| 3            | 0.5    | 8            | 50          | 4              | 2      | P-RTA430052        | .00        | .01    | .02   | .03   |
| 3            | 1      | 8            | 50          | 4              | 2      | P-RTA430102        | .00        | .01    | .02   | .03   |
| 4            | 0.2    | 10           | 50          | 4              | 2      | P-RTA040022        | .00        | .01    | .02   | .03   |
| 4            | 0.3    | 10           | 50          | 4              | 2      | P-RTA040032        | .00        | .01    | .02   | .03   |
| 4            | 0.5    | 10           | 50          | 4              | 2      | P-RTA040052        | .00        | .01    | .02   | .03   |
| 4            | 1      | 10           | 50          | 4              | 2      | P-RTA040102        | .00        | .01    | .02   | .03   |
| 4            | 1.5    | 10           | 50          | 4              | 2      | P-RTA040152        | .00        | .01    | .02   | .03   |
| 5            | 0.2    | 13           | 50          | 6              | 2      | P-RTA050022        | .00        | .01    | .02   | .03   |
| 5            | 0.3    | 13           | 50          | 6              | 2      | P-RTA050032        | .00        | .01    | .02   | .03   |
| 5            | 0.5    | 13           | 50          | 6              | 2      | P-RTA050052        | .00        | .01    | .02   | .03   |
| 5            | 1      | 13           | 50          | 6              | 2      | P-RTA050102        | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                        | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTIBN     | ◎                                  | ◎                      | ◎                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                      | ○                  | ◎      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ◎                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

# 600<sup>+</sup>

切削條件表 **P353**  
Cutting Condition

## Corner Radius Type - 2 flutes

### 2刃圓鼻立銑刀

600 PLUS

HRC 45

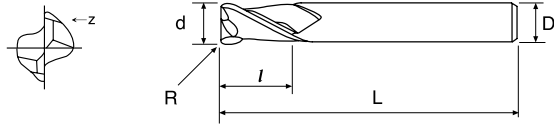
35°

a  
b > a

R

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 6            | 0.2    | 15           | 50          | 6              | 2      | P-RTA060022        | .00        | .01    | .02   | .03   |
| 6            | 0.3    | 15           | 50          | 6              | 2      | P-RTA060032        | .00        | .01    | .02   | .03   |
| 6            | 0.5    | 15           | 50          | 6              | 2      | P-RTA060052        | .00        | .01    | .02   | .03   |
| 6            | 1      | 15           | 50          | 6              | 2      | P-RTA060102        | .00        | .01    | .02   | .03   |
| 6            | 1.5    | 15           | 50          | 6              | 2      | P-RTA060152        | .00        | .01    | .02   | .03   |
| 6            | 2      | 15           | 50          | 6              | 2      | P-RTA060202        | .00        | .01    | .02   | .03   |
| 8            | 0.3    | 20           | 60          | 8              | 2      | P-RTA080032        | .00        | .01    | .02   | .03   |
| 8            | 0.5    | 20           | 60          | 8              | 2      | P-RTA080052        | .00        | .01    | .02   | .03   |
| 8            | 1      | 20           | 60          | 8              | 2      | P-RTA080102        | .00        | .01    | .02   | .03   |
| 8            | 1.5    | 20           | 60          | 8              | 2      | P-RTA080152        | .00        | .01    | .02   | .03   |
| 8            | 2      | 20           | 60          | 8              | 2      | P-RTA080202        | .00        | .01    | .02   | .03   |
| 8            | 2.5    | 20           | 60          | 8              | 2      | P-RTA080252        | .00        | .01    | .02   | .03   |
| 8            | 3      | 20           | 60          | 8              | 2      | P-RTA080302        | .00        | .01    | .02   | .03   |
| 10           | 0.3    | 25           | 75          | 10             | 2      | P-RTA100032        | .00        | .01    | .02   | .03   |
| 10           | 0.5    | 25           | 75          | 10             | 2      | P-RTA100052        | .00        | .01    | .02   | .03   |
| 10           | 1      | 25           | 75          | 10             | 2      | P-RTA100102        | .00        | .01    | .02   | .03   |
| 10           | 1.5    | 25           | 75          | 10             | 2      | P-RTA100152        | .00        | .01    | .02   | .03   |
| 10           | 2      | 25           | 75          | 10             | 2      | P-RTA100202        | .00        | .01    | .02   | .03   |
| 10           | 2.5    | 25           | 75          | 10             | 2      | P-RTA100252        | .00        | .01    | .02   | .03   |
| 10           | 3      | 25           | 75          | 10             | 2      | P-RTA100302        | .00        | .01    | .02   | .03   |
| 12           | 0.3    | 30           | 75          | 12             | 2      | P-RTA120032        | .00        | .01    | .02   | .03   |
| 12           | 0.5    | 30           | 75          | 12             | 2      | P-RTA120052        | .00        | .01    | .02   | .03   |
| 12           | 1      | 30           | 75          | 12             | 2      | P-RTA120102        | .00        | .01    | .02   | .03   |
| 12           | 1.5    | 30           | 75          | 12             | 2      | P-RTA120152        | .00        | .01    | .02   | .03   |
| 12           | 2      | 30           | 75          | 12             | 2      | P-RTA120202        | .00        | .01    | .02   | .03   |
| 12           | 2.5    | 30           | 75          | 12             | 2      | P-RTA120252        | .00        | .01    | .02   | .03   |
| 12           | 3      | 30           | 75          | 12             | 2      | P-RTA120302        | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    |                        | ~45HRC             | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |        |                     |                    | ○                         | ○                   |                    |
| ALTIBN     | ◎                                  | ◎                      | ◎                  | ○      |        |        | ○      |                     |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                      | ○                  | ◎      |        |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ◎                  | ○      |        |        | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

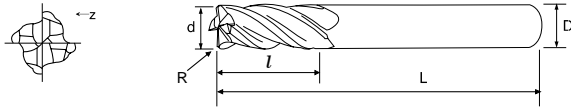
**600<sup>+</sup>** 切削條件表 **P354**  
Cutting Condition

## Corner Radius Type - 4 flutes ■ 4刃圓鼻立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 |            | ALTIBN | TISIN | ZrN-A |
| 2            | 0.2    | 6            | 50          | 4              | 4      | P-RTA020024        | .00        | .01    | .02   | .03   |
| 2            | 0.3    | 6            | 50          | 4              | 4      | P-RTA020034        | .00        | .01    | .02   | .03   |
| 2            | 0.5    | 6            | 50          | 4              | 4      | P-RTA020054        | .00        | .01    | .02   | .03   |
| 2.5          | 0.2    | 8            | 50          | 4              | 4      | P-RTA025024        | .00        | .01    | .02   | .03   |
| 3            | 0.2    | 8            | 50          | 3              | 4      | P-RTA030024        | .00        | .01    | .02   | .03   |
| 3            | 0.3    | 8            | 50          | 3              | 4      | P-RTA030034        | .00        | .01    | .02   | .03   |
| 3            | 0.5    | 8            | 50          | 3              | 4      | P-RTA030054        | .00        | .01    | .02   | .03   |
| 3            | 1      | 8            | 50          | 3              | 4      | P-RTA030104        | .00        | .01    | .02   | .03   |
| 3            | 0.2    | 8            | 50          | 4              | 4      | P-RTA430024        | .00        | .01    | .02   | .03   |
| 3            | 0.3    | 8            | 50          | 4              | 4      | P-RTA430034        | .00        | .01    | .02   | .03   |
| 3            | 0.5    | 8            | 50          | 4              | 4      | P-RTA430054        | .00        | .01    | .02   | .03   |
| 3            | 1      | 8            | 50          | 4              | 4      | P-RTA430104        | .00        | .01    | .02   | .03   |
| 4            | 0.2    | 10           | 50          | 4              | 4      | P-RTA040024        | .00        | .01    | .02   | .03   |
| 4            | 0.3    | 10           | 50          | 4              | 4      | P-RTA040034        | .00        | .01    | .02   | .03   |
| 4            | 0.5    | 10           | 50          | 4              | 4      | P-RTA040054        | .00        | .01    | .02   | .03   |
| 4            | 1      | 10           | 50          | 4              | 4      | P-RTA040104        | .00        | .01    | .02   | .03   |
| 4            | 1.5    | 10           | 50          | 4              | 4      | P-RTA040154        | .00        | .01    | .02   | .03   |
| 5            | 0.2    | 13           | 50          | 6              | 4      | P-RTA050024        | .00        | .01    | .02   | .03   |
| 5            | 0.3    | 13           | 50          | 6              | 4      | P-RTA050034        | .00        | .01    | .02   | .03   |
| 5            | 0.5    | 13           | 50          | 6              | 4      | P-RTA050054        | .00        | .01    | .02   | .03   |
| 5            | 1      | 13           | 50          | 6              | 4      | P-RTA050104        | .00        | .01    | .02   | .03   |
| 6            | 0.2    | 15           | 50          | 6              | 4      | P-RTA060024        | .00        | .01    | .02   | .03   |
| 6            | 0.3    | 15           | 50          | 6              | 4      | P-RTA060034        | .00        | .01    | .02   | .03   |
| 6            | 0.5    | 15           | 50          | 6              | 4      | P-RTA060054        | .00        | .01    | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                    |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                    | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                    | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ◎                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

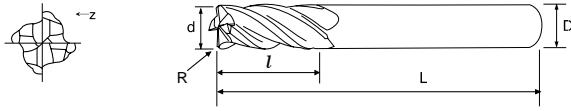
**600<sup>+</sup>** 切削條件表 **P354**  
Cutting Condition

## Corner Radius Type - 4 flutes ■ 4刃圓鼻立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |     |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|-----|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |     |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | TISIN | ZrN-A |     |
| 6            | 1      | 15           | 50          | 6              | 4      | P-RTA060104        | .00        | .01   | .02   | .03 |
| 6            | 1.5    | 15           | 50          | 6              | 4      | P-RTA060154        | .00        | .01   | .02   | .03 |
| 6            | 2      | 15           | 50          | 6              | 4      | P-RTA060204        | .00        | .01   | .02   | .03 |
| 8            | 0.3    | 20           | 60          | 8              | 4      | P-RTA080034        | .00        | .01   | .02   | .03 |
| 8            | 0.5    | 20           | 60          | 8              | 4      | P-RTA080054        | .00        | .01   | .02   | .03 |
| 8            | 1      | 20           | 60          | 8              | 4      | P-RTA080104        | .00        | .01   | .02   | .03 |
| 8            | 1.5    | 20           | 60          | 8              | 4      | P-RTA080154        | .00        | .01   | .02   | .03 |
| 8            | 2      | 20           | 60          | 8              | 4      | P-RTA080204        | .00        | .01   | .02   | .03 |
| 8            | 2.5    | 20           | 60          | 8              | 4      | P-RTA080254        | .00        | .01   | .02   | .03 |
| 8            | 3      | 20           | 60          | 8              | 4      | P-RTA080304        | .00        | .01   | .02   | .03 |
| 10           | 0.3    | 25           | 75          | 10             | 4      | P-RTA100034        | .00        | .01   | .02   | .03 |
| 10           | 0.5    | 25           | 75          | 10             | 4      | P-RTA100054        | .00        | .01   | .02   | .03 |
| 10           | 1      | 25           | 75          | 10             | 4      | P-RTA100104        | .00        | .01   | .02   | .03 |
| 10           | 1.5    | 25           | 75          | 10             | 4      | P-RTA100154        | .00        | .01   | .02   | .03 |
| 10           | 2      | 25           | 75          | 10             | 4      | P-RTA100204        | .00        | .01   | .02   | .03 |
| 10           | 2.5    | 25           | 75          | 10             | 4      | P-RTA100254        | .00        | .01   | .02   | .03 |
| 10           | 3      | 25           | 75          | 10             | 4      | P-RTA100304        | .00        | .01   | .02   | .03 |
| 12           | 0.3    | 30           | 75          | 12             | 4      | P-RTA120034        | .00        | .01   | .02   | .03 |
| 12           | 0.5    | 30           | 75          | 12             | 4      | P-RTA120054        | .00        | .01   | .02   | .03 |
| 12           | 1      | 30           | 75          | 12             | 4      | P-RTA120104        | .00        | .01   | .02   | .03 |
| 12           | 1.5    | 30           | 75          | 12             | 4      | P-RTA120154        | .00        | .01   | .02   | .03 |
| 12           | 2      | 30           | 75          | 12             | 4      | P-RTA120204        | .00        | .01   | .02   | .03 |
| 12           | 2.5    | 30           | 75          | 12             | 4      | P-RTA120254        | .00        | .01   | .02   | .03 |
| 12           | 3      | 30           | 75          | 12             | 4      | P-RTA120304        | .00        | .01   | .02   | .03 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
|            | ○                                  | ○                      |                    |        |        |        |                     |                    |                           | ○                   | ○                  |
| ALTIBN     | ◎                                  | ◎                      | ◎                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TISIN      | ○                                  | ○                      | ○                  | ◎      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ◎                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

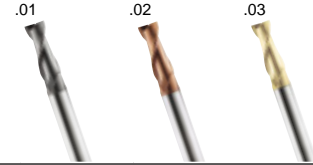
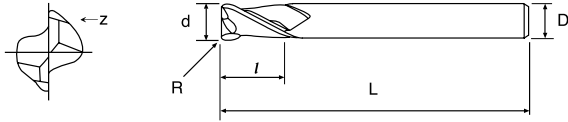
**600<sup>+</sup>** 切削條件表 **P353**  
Cutting Condition

### Corner Radius Type - Long Shank - 2 flutes ■ 2刃長柄圓鼻立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | TiSiN | ZrN-A |
| 3            | 0.3    | 8            | 75          | 3              | 2      | P-LRTA030032       | .01        | .02   | .03   |
| 3            | 0.5    | 8            | 75          | 3              | 2      | P-LRTA030052       | .01        | .02   | .03   |
| 3            | 1      | 8            | 75          | 3              | 2      | P-LRTA030102       | .01        | .02   | .03   |
| 4            | 0.3    | 10           | 75          | 4              | 2      | P-LRTA040032       | .01        | .02   | .03   |
| 4            | 0.5    | 10           | 75          | 4              | 2      | P-LRTA040052       | .01        | .02   | .03   |
| 4            | 1      | 10           | 75          | 4              | 2      | P-LRTA040102       | .01        | .02   | .03   |
| 4            | 1.5    | 10           | 75          | 4              | 2      | P-LRTA040152       | .01        | .02   | .03   |
| 6            | 0.3    | 15           | 100         | 6              | 2      | P-LRTA060032       | .01        | .02   | .03   |
| 6            | 0.5    | 15           | 100         | 6              | 2      | P-LRTA060052       | .01        | .02   | .03   |
| 6            | 1      | 15           | 100         | 6              | 2      | P-LRTA060102       | .01        | .02   | .03   |
| 6            | 1.5    | 15           | 100         | 6              | 2      | P-LRTA060152       | .01        | .02   | .03   |
| 6            | 2      | 15           | 100         | 6              | 2      | P-LRTA060202       | .01        | .02   | .03   |
| 8            | 0.3    | 20           | 100         | 8              | 2      | P-LRTA080032       | .01        | .02   | .03   |
| 8            | 0.5    | 20           | 100         | 8              | 2      | P-LRTA080052       | .01        | .02   | .03   |
| 8            | 1      | 20           | 100         | 8              | 2      | P-LRTA080102       | .01        | .02   | .03   |
| 8            | 1.5    | 20           | 100         | 8              | 2      | P-LRTA080152       | .01        | .02   | .03   |
| 8            | 2      | 20           | 100         | 8              | 2      | P-LRTA080202       | .01        | .02   | .03   |
| 8            | 2.5    | 20           | 100         | 8              | 2      | P-LRTA080252       | .01        | .02   | .03   |
| 8            | 3      | 20           | 100         | 8              | 2      | P-LRTA080302       | .01        | .02   | .03   |
| 10           | 0.3    | 25           | 100         | 10             | 2      | P-LRTA100032       | .01        | .02   | .03   |
| 10           | 0.5    | 25           | 100         | 10             | 2      | P-LRTA100052       | .01        | .02   | .03   |
| 10           | 1      | 25           | 100         | 10             | 2      | P-LRTA100102       | .01        | .02   | .03   |
| 10           | 1.5    | 25           | 100         | 10             | 2      | P-LRTA100152       | .01        | .02   | .03   |
| 10           | 2      | 25           | 100         | 10             | 2      | P-LRTA100202       | .01        | .02   | .03   |
| 10           | 2.5    | 25           | 100         | 10             | 2      | P-LRTA100252       | .01        | .02   | .03   |
| 10           | 3      | 25           | 100         | 10             | 2      | P-LRTA100302       | .01        | .02   | .03   |
| 12           | 0.3    | 30           | 100         | 12             | 2      | P-LRTA120032       | .01        | .02   | .03   |
| 12           | 0.5    | 30           | 100         | 12             | 2      | P-LRTA120052       | .01        | .02   | .03   |
| 12           | 1      | 30           | 100         | 12             | 2      | P-LRTA120102       | .01        | .02   | .03   |
| 12           | 1.5    | 30           | 100         | 12             | 2      | P-LRTA120152       | .01        | .02   | .03   |
| 12           | 2      | 30           | 100         | 12             | 2      | P-LRTA120202       | .01        | .02   | .03   |
| 12           | 2.5    | 30           | 100         | 12             | 2      | P-LRTA120252       | .01        | .02   | .03   |
| 12           | 3      | 30           | 100         | 12             | 2      | P-LRTA120302       | .01        | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ○                  | ○      |        |        | ○                   |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                      | ○                  | ○      |        |        |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                      | ○                  | ○      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**600<sup>+</sup>** 切削條件表 **P354**  
Cutting Condition

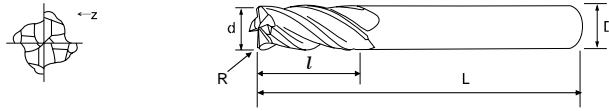
## Corner Radius Type - Long Shank - 4 flutes

### 4刃長柄圓鼻立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiN      | TiSiN | ZrN-A |
| 3            | 0.3    | 8            | 75          | 3              | 4      | P-LRTA030034       | .01        | .02   | .03   |
| 3            | 0.5    | 8            | 75          | 3              | 4      | P-LRTA030054       | .01        | .02   | .03   |
| 3            | 1      | 8            | 75          | 3              | 4      | P-LRTA030104       | .01        | .02   | .03   |
| 4            | 0.3    | 10           | 75          | 4              | 4      | P-LRTA040034       | .01        | .02   | .03   |
| 4            | 0.5    | 10           | 75          | 4              | 4      | P-LRTA040054       | .01        | .02   | .03   |
| 4            | 1      | 10           | 75          | 4              | 4      | P-LRTA040104       | .01        | .02   | .03   |
| 4            | 1.5    | 10           | 75          | 4              | 4      | P-LRTA040154       | .01        | .02   | .03   |
| 6            | 0.3    | 15           | 100         | 6              | 4      | P-LRTA060034       | .01        | .02   | .03   |
| 6            | 0.5    | 15           | 100         | 6              | 4      | P-LRTA060054       | .01        | .02   | .03   |
| 6            | 1      | 15           | 100         | 6              | 4      | P-LRTA060104       | .01        | .02   | .03   |
| 6            | 1.5    | 15           | 100         | 6              | 4      | P-LRTA060154       | .01        | .02   | .03   |
| 6            | 2      | 15           | 100         | 6              | 4      | P-LRTA060204       | .01        | .02   | .03   |
| 8            | 0.3    | 20           | 100         | 8              | 4      | P-LRTA080034       | .01        | .02   | .03   |
| 8            | 0.5    | 20           | 100         | 8              | 4      | P-LRTA080054       | .01        | .02   | .03   |
| 8            | 1      | 20           | 100         | 8              | 4      | P-LRTA080104       | .01        | .02   | .03   |
| 8            | 1.5    | 20           | 100         | 8              | 4      | P-LRTA080154       | .01        | .02   | .03   |
| 8            | 2      | 20           | 100         | 8              | 4      | P-LRTA080204       | .01        | .02   | .03   |
| 8            | 2.5    | 20           | 100         | 8              | 4      | P-LRTA080254       | .01        | .02   | .03   |
| 8            | 3      | 20           | 100         | 8              | 4      | P-LRTA080304       | .01        | .02   | .03   |
| 10           | 0.3    | 25           | 100         | 10             | 4      | P-LRTA100034       | .01        | .02   | .03   |
| 10           | 0.5    | 25           | 100         | 10             | 4      | P-LRTA100054       | .01        | .02   | .03   |
| 10           | 1      | 25           | 100         | 10             | 4      | P-LRTA100104       | .01        | .02   | .03   |
| 10           | 1.5    | 25           | 100         | 10             | 4      | P-LRTA100154       | .01        | .02   | .03   |
| 10           | 2      | 25           | 100         | 10             | 4      | P-LRTA100204       | .01        | .02   | .03   |
| 10           | 2.5    | 25           | 100         | 10             | 4      | P-LRTA100254       | .01        | .02   | .03   |
| 10           | 3      | 25           | 100         | 10             | 4      | P-LRTA100304       | .01        | .02   | .03   |
| 12           | 0.3    | 30           | 100         | 12             | 4      | P-LRTA120034       | .01        | .02   | .03   |
| 12           | 0.5    | 30           | 100         | 12             | 4      | P-LRTA120054       | .01        | .02   | .03   |
| 12           | 1      | 30           | 100         | 12             | 4      | P-LRTA120104       | .01        | .02   | .03   |
| 12           | 1.5    | 30           | 100         | 12             | 4      | P-LRTA120154       | .01        | .02   | .03   |
| 12           | 2      | 30           | 100         | 12             | 4      | P-LRTA120204       | .01        | .02   | .03   |
| 12           | 2.5    | 30           | 100         | 12             | 4      | P-LRTA120254       | .01        | .02   | .03   |
| 12           | 3      | 30           | 100         | 12             | 4      | P-LRTA120304       | .01        | .02   | .03   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiN      | ◎                                  | ◎                    | ○                  | ○      |        |        | ○ |                     |                    |                           |                     |                    |
| TiSiN      | ○                                  | ○                    | ○                  | ○      |        |        |   |                     |                    |                           |                     |                    |
| ZrN-A      | ◎                                  | ◎                    | ○                  | ○      |        |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm



# General Series 泛用系列

400 PLUS Series - Unequal Flute Spacing & Helix Design  
抗震系列 - 不等分割、不等螺旋刀型設計



# 400 PLUS

SERIES

## Unequal Flute Spacing & Helix 不等分割 & 不等螺旋

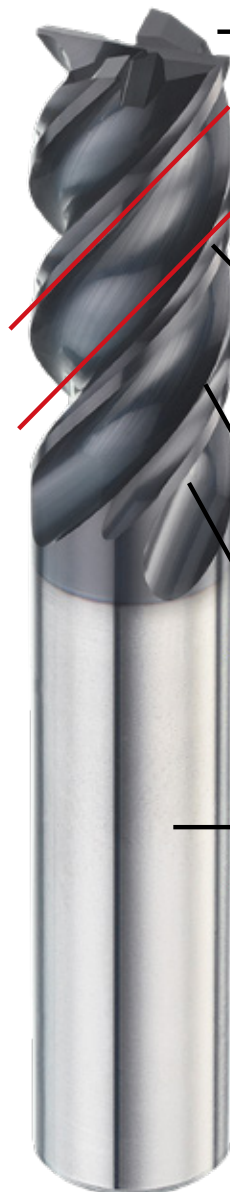
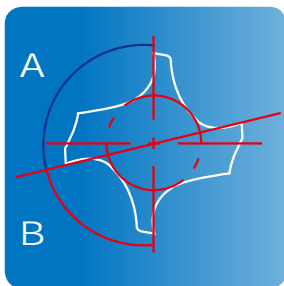
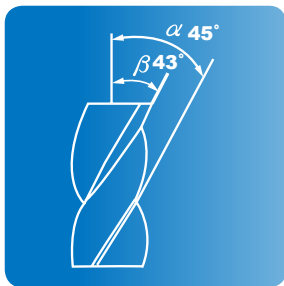
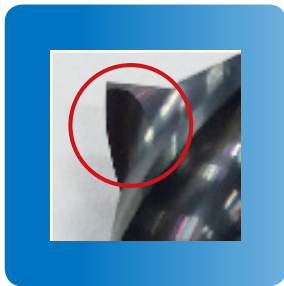
- Excellent vibration absorption provides stability.
- 降低刀具加工時產生的震動頻率
- Less chatter and high efficiency finishing.
- 減少工件側壁的切削震紋
- Reduce metal burr when machining.
- 減少刀具加工產生的端口毛刺





## 400 PLUS Series 400 PLUS 系列

Unequal Flute Spacing & Helix 不等分割 / 不等螺旋



Strong edge to prevent chipping at corners.  
厚實端角設計防止刀具崩裂。

Unequal Flute Spacing,  $A \neq B$  Irregular Helix Flutes,  $\alpha \neq \beta$  Ensures stable machining of difficult-to-cut materials, and achieve high efficient performance.

刀刃分割角採用  $A \neq B$  刀刃螺旋角採用  $\alpha \neq \beta$  於刀刃採用不等分割角搭配其不等螺旋的設計，能有效的降低刀具加工時所產生的共振；因此 400PLUS 能執行高效能切削及難切削材應用。

Tool diameter tolerance 0~-0.02mm.  
刃徑容許公差 0~-0.02mm

Special flute geometry to improve chip disposal.  
特殊圓形溝槽設計，可提升排屑效果，減少應力產生，提高刀具強度。

Superior wear and chipping resistance due to optimally matched coating and carbide material  
奈米超硬底材，驚異高抗損性、優異耐磨耗性。

### 1. Excellent vibration absorption provides stability.

降低刀具加工時產生的震動頻率

### 2. Less chatter and high efficiency finishing.

減少工件側壁的切削震紋

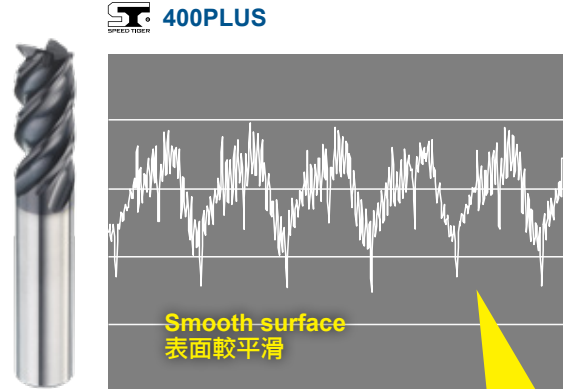
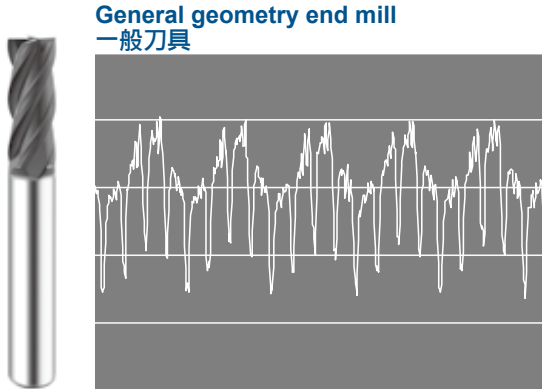
### 3. Reduce metal burr when machining.

減少刀具加工產生的端口毛刺

# Cutting Performance 實測比較

## Cutting Analysis 切削比較

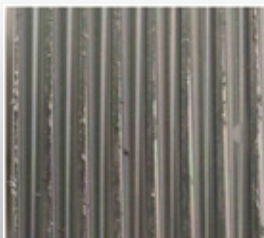
Use Dynamometer Measure System to inspect the vibration of general end mills and 400PLUS during milling.  
 在相同的切削時間 (X 軸) 跟切削條件 (Y 軸) 下, 使用動力測量儀測量一般刀具與 400PLUS 抗震刀具的振動頻率。



Vibration frequency is more intensive, it means that the force of the workpiece is more even.  
 圖面震動頻率較密集, 表示工件受力較平均。

## Equal V.S Unequal - Performance of Slotting SUS316 一般刀具 VS 400PLUS-SUS316 開溝實測

**General geometry end mill**  
一般刀具



**Metal Burr: A lot**  
毛刺: 很多  
**Surface: Not smooth**  
表面: 不平滑

**PVE1004 (ø10mm)**  
400PLUS



**Metal Burr: Less**  
毛刺: 極少  
**Surface: Excellent**  
表面: 光滑

**Unequal Design**  
不等設計

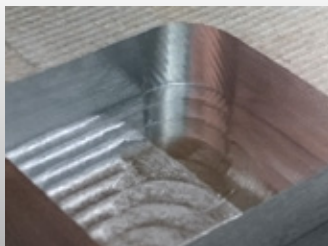
+

**Special Flute Geometry**  
特殊刃部設計

- ✓ **Prevent Burr** 減少毛刺
- ✓ **Excellent Surface** 光滑表面
- ✓ **Improve Chip Disposal** 不易積屑
- ✓ **Longer Tool Life** 延長壽命

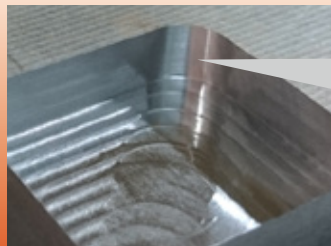
## Equal vs. Unequal - Shouldering and Corner Part 一般刀具 VS 400PLUS- 肩銑與轉角處比較

**General geometry end mill**  
一般刀具



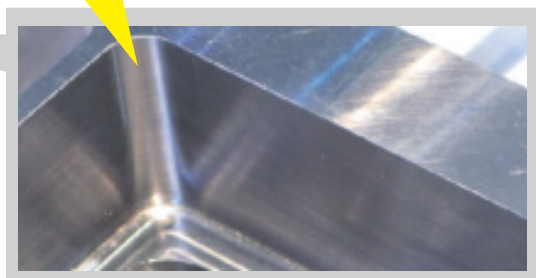
**Surface: Chattering**  
波紋表面

**PVE0804 (8mm)**  
400PLUS



**Excellent Surface**  
精緻表面 !!

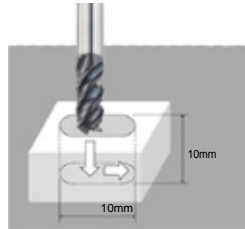
Smooth cutting at shouldering and corner part.  
 不等設計抑制高頻顫震, 使表面光滑。



# Cutting Performance 實測比較

Unequal V.S Unequal - Surface and Tool Life Comparison  
 他牌抗震刀具 V.S 震虎抗震刀具 - 表面及壽命比較

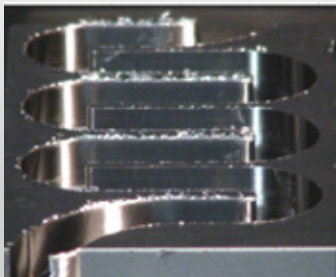
| End mill 刀具                | PVE1004 (Ø10mm)                      |
|----------------------------|--------------------------------------|
| Workpiece Material 工件      | SUS316                               |
| Milling Type 加工方式          | Slotting 溝銑                          |
| Rotation Speed (S) 轉速      | 2644rpm                              |
| Milling Speed (Vc) 切削速度    | 83m/min                              |
| Feed Rate (min-1) (F) 進給速度 | 646 mm/min                           |
| Depth of cut 切深            | ap=10mm<br>ae: 10mm                  |
| Feed of teeth (Fz) 每刃進給量   | 0.062                                |
| Machine 使用機台               | Vertical Machining Center<br>立式綜合加工機 |



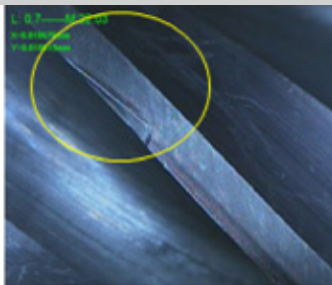
400PLUS video 切削影片



## Competitor A 他牌 A

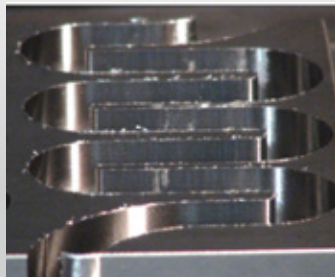


**Metal Burr: Heavy** 毛刺: 較厚  
**Surface: Fine** 切壁: 尚可

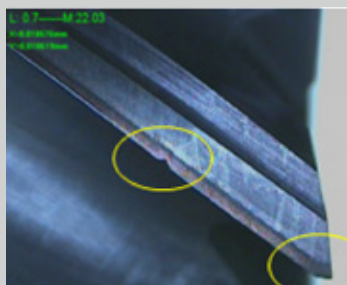


**The cutting edge broke.**  
 刃部破損

## Competitor B 他牌 B

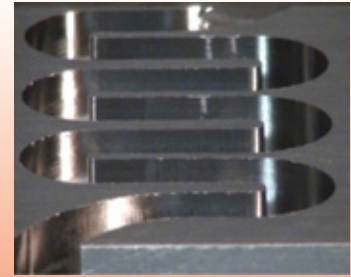


**Metal Burr: Some** 毛刺: 較少  
**Surface: Chattering** 切壁: 震紋明顯



**The cutting edge got chipping.**  
 刃部缺角

## PVE1004 (Ø10mm)



**Metal Burr: Less** 毛刺: 極少  
**Surface: Excellent** 切壁: 光亮



**The cutting edge is fine!**  
 刃部良好

**Maximized Rigidity**  
 最大鋼性

## Different Cutting Conditions on milling Carbon Steel (S45C) 加工於碳素鋼 S45C 的各式切削數據

**Slotting 溝銑**  
 S2546rpm F500  
 ae:10mm ap:10mm

**Helical Slot Milling 盲仁孔加工**  
 S3183rpm F1273  
 ae:2mm ap:10mm

**Wave Slotting 波浪開溝**  
 S2228rpm F446  
 ae:10mm ap:10mm



**5° Ramping 5度斜面插銑**  
 S2228rpm F624  
 ae:6mm ap:13.8mm

**Helical Milling 盲圓孔加工**  
 S3183rpm F1273  
 ae:2mm ap:12mm

**Wave Side Milling 波浪側銑**  
 S3183rpm F1273  
 ae:2mm ap:20mm

**Side Milling 側銑**  
 S3183rpm F637  
 ae:2mm ap:20mm

**400<sup>+</sup>** 切削條件表 **P355**  
Cutting Condition

## Miniature Square Type - 2 flutes ■ 2刃微小徑立銑刀

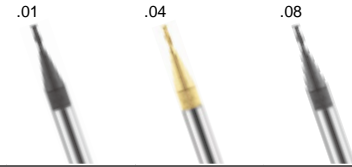
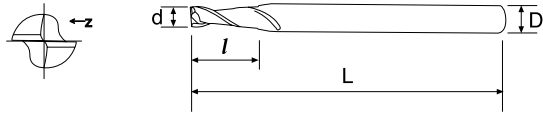
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



HRC ▶ 40

HRC ▶ 45

HRC ▶ 50

HRC ▶ 55

HRC ▶ 60

HRC ▶ 65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.2          | 0.4          | 38          | 3              | 2      | P-UMIE3022         | .01        | .04   | .08   |
| 0.3          | 0.6          | 38          | 3              | 2      | P-UMIE3032         | .01        | .04   | .08   |
| 0.4          | 0.7          | 38          | 3              | 2      | P-UMIE3042         | .01        | .04   | .08   |
| 0.5          | 0.8          | 38          | 3              | 2      | P-UMIE3052         | .01        | .04   | .08   |
| 0.6          | 0.9          | 38          | 3              | 2      | P-UMIE3062         | .01        | .04   | .08   |
| 0.7          | 1.4          | 38          | 3              | 2      | P-UMIE3072         | .01        | .04   | .08   |
| 0.8          | 1.6          | 38          | 3              | 2      | P-UMIE3082         | .01        | .04   | .08   |
| 0.9          | 1.8          | 38          | 3              | 2      | P-UMIE3092         | .01        | .04   | .08   |
| 1            | 3            | 38          | 3              | 2      | P-UMIE3102         | .01        | .04   | .08   |
| 1.1          | 3            | 38          | 3              | 2      | P-UMIE3112         | .01        | .04   | .08   |
| 1.2          | 3            | 38          | 3              | 2      | P-UMIE3122         | .01        | .04   | .08   |
| 1.3          | 3            | 38          | 3              | 2      | P-UMIE3132         | .01        | .04   | .08   |
| 1.4          | 3            | 38          | 3              | 2      | P-UMIE3142         | .01        | .04   | .08   |
| 1.5          | 4            | 38          | 3              | 2      | P-UMIE3152         | .01        | .04   | .08   |
| 1.6          | 4            | 38          | 3              | 2      | P-UMIE3162         | .01        | .04   | .08   |
| 1.7          | 4            | 38          | 3              | 2      | P-UMIE3172         | .01        | .04   | .08   |
| 1.8          | 4            | 38          | 3              | 2      | P-UMIE3182         | .01        | .04   | .08   |
| 1.9          | 4            | 38          | 3              | 2      | P-UMIE3192         | .01        | .04   | .08   |
| 2            | 6            | 38          | 3              | 2      | P-UMIE3202         | .01        | .04   | .08   |
| 2.1          | 6            | 38          | 3              | 2      | P-UMIE3212         | .01        | .04   | .08   |
| 2.2          | 6            | 38          | 3              | 2      | P-UMIE3222         | .01        | .04   | .08   |
| 2.3          | 6            | 38          | 3              | 2      | P-UMIE3232         | .01        | .04   | .08   |
| 2.4          | 6            | 38          | 3              | 2      | P-UMIE3242         | .01        | .04   | .08   |
| 2.5          | 8            | 38          | 3              | 2      | P-UMIE3252         | .01        | .04   | .08   |
| 2.6          | 8            | 38          | 3              | 2      | P-UMIE3262         | .01        | .04   | .08   |
| 2.7          | 8            | 38          | 3              | 2      | P-UMIE3272         | .01        | .04   | .08   |
| 2.8          | 8            | 38          | 3              | 2      | P-UMIE3282         | .01        | .04   | .08   |
| 2.9          | 8            | 38          | 3              | 2      | P-UMIE3292         | .01        | .04   | .08   |
| 3            | 8            | 38          | 3              | 2      | P-UMIE3302         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      |        |        | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      |        |        |                     | ○                  |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P355**  
Cutting Condition

### Miniature Square Type - 2 flutes

## ■ 2刃微小徑立銑刀

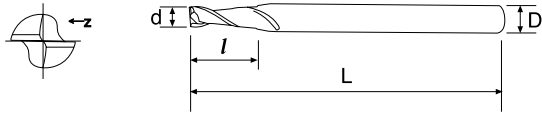
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.2          | 0.4          | 50          | 4              | 2      | P-UMIE0022         | .01        | .04   | .08   |
| 0.3          | 0.6          | 50          | 4              | 2      | P-UMIE0032         | .01        | .04   | .08   |
| 0.4          | 0.7          | 50          | 4              | 2      | P-UMIE0042         | .01        | .04   | .08   |
| 0.5          | 0.8          | 50          | 4              | 2      | P-UMIE0052         | .01        | .04   | .08   |
| 0.6          | 0.9          | 50          | 4              | 2      | P-UMIE0062         | .01        | .04   | .08   |
| 0.7          | 1.4          | 50          | 4              | 2      | P-UMIE0072         | .01        | .04   | .08   |
| 0.8          | 1.6          | 50          | 4              | 2      | P-UMIE0082         | .01        | .04   | .08   |
| 0.9          | 1.8          | 50          | 4              | 2      | P-UMIE0092         | .01        | .04   | .08   |
| 1            | 3            | 50          | 4              | 2      | P-UMIE0102         | .01        | .04   | .08   |
| 1.1          | 3            | 50          | 4              | 2      | P-UMIE0112         | .01        | .04   | .08   |
| 1.2          | 3            | 50          | 4              | 2      | P-UMIE0122         | .01        | .04   | .08   |
| 1.3          | 3            | 50          | 4              | 2      | P-UMIE0132         | .01        | .04   | .08   |
| 1.4          | 3            | 50          | 4              | 2      | P-UMIE0142         | .01        | .04   | .08   |
| 1.5          | 4            | 50          | 4              | 2      | P-UMIE0152         | .01        | .04   | .08   |
| 1.6          | 4            | 50          | 4              | 2      | P-UMIE0162         | .01        | .04   | .08   |
| 1.7          | 4            | 50          | 4              | 2      | P-UMIE0172         | .01        | .04   | .08   |
| 1.8          | 4            | 50          | 4              | 2      | P-UMIE0182         | .01        | .04   | .08   |
| 1.9          | 4            | 50          | 4              | 2      | P-UMIE0192         | .01        | .04   | .08   |
| 2            | 6            | 50          | 4              | 2      | P-UMIE0202         | .01        | .04   | .08   |
| 2.1          | 6            | 50          | 4              | 2      | P-UMIE0212         | .01        | .04   | .08   |
| 2.2          | 6            | 50          | 4              | 2      | P-UMIE0222         | .01        | .04   | .08   |
| 2.3          | 6            | 50          | 4              | 2      | P-UMIE0232         | .01        | .04   | .08   |
| 2.4          | 6            | 50          | 4              | 2      | P-UMIE0242         | .01        | .04   | .08   |
| 2.5          | 8            | 50          | 4              | 2      | P-UMIE0252         | .01        | .04   | .08   |
| 2.6          | 8            | 50          | 4              | 2      | P-UMIE0262         | .01        | .04   | .08   |
| 2.7          | 8            | 50          | 4              | 2      | P-UMIE0272         | .01        | .04   | .08   |
| 2.8          | 8            | 50          | 4              | 2      | P-UMIE0282         | .01        | .04   | .08   |
| 2.9          | 8            | 50          | 4              | 2      | P-UMIE0292         | .01        | .04   | .08   |
| 3            | 8            | 50          | 4              | 2      | P-UMIE0302         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      |        |        | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      |        |        |                     | ○                  |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      |        |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P356

Cutting Condition

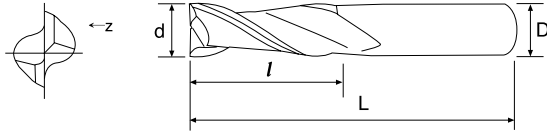
### Square Type - 2 flutes

## ■ 2刃立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 3            | 50          | 4              | 2      | P-UET0102          | .01        | .04   | .08   |
| 1.5          | 4            | 50          | 4              | 2      | P-UET0152          | .01        | .04   | .08   |
| 2            | 6            | 50          | 4              | 2      | P-UET0202          | .01        | .04   | .08   |
| 2.5          | 8            | 50          | 4              | 2      | P-UET0252          | .01        | .04   | .08   |
| 3            | 8            | 50          | 4              | 2      | P-UET0302          | .01        | .04   | .08   |
| 3.5          | 10           | 50          | 4              | 2      | P-UET0352          | .01        | .04   | .08   |
| 4            | 11           | 50          | 4              | 2      | P-UET0402          | .01        | .04   | .08   |
| 4.5          | 13           | 50          | 6              | 2      | P-UET0452          | .01        | .04   | .08   |
| 5            | 13           | 50          | 6              | 2      | P-UET0502          | .01        | .04   | .08   |
| 5.5          | 13           | 50          | 6              | 2      | P-UET0552          | .01        | .04   | .08   |
| 6            | 16           | 50          | 6              | 2      | P-UET0602          | .01        | .04   | .08   |
| 6.5          | 16           | 60          | 8              | 2      | P-UET0652          | .01        | .04   | .08   |
| 7            | 17           | 60          | 8              | 2      | P-UET0702          | .01        | .04   | .08   |
| 7.5          | 17           | 60          | 8              | 2      | P-UET0752          | .01        | .04   | .08   |
| 8            | 21           | 60          | 8              | 2      | P-UET0802          | .01        | .04   | .08   |
| 8.5          | 25           | 75          | 10             | 2      | P-UET0852          | .01        | .04   | .08   |
| 9            | 25           | 75          | 10             | 2      | P-UET0902          | .01        | .04   | .08   |
| 9.5          | 25           | 75          | 10             | 2      | P-UET0952          | .01        | .04   | .08   |
| 10           | 26           | 75          | 10             | 2      | P-UET1002          | .01        | .04   | .08   |
| 11           | 28           | 75          | 12             | 2      | P-UET1102          | .01        | .04   | .08   |
| 12           | 30           | 75          | 12             | 2      | P-UET1202          | .01        | .04   | .08   |
| 13           | 33           | 75          | 14             | 2      | P-UET1302          | .01        | .04   | .08   |
| 14           | 33           | 75          | 14             | 2      | P-UET1402          | .01        | .04   | .08   |
| 15           | 33           | 75          | 16             | 2      | P-UET1502          | .01        | .04   | .08   |
| 16           | 33           | 75          | 16             | 2      | P-UET1602          | .01        | .04   | .08   |
| 18           | 45           | 100         | 18             | 2      | P-UET1802          | .01        | .04   | .08   |
| 20           | 50           | 100         | 20             | 2      | P-UET2002          | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ○ |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |   | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P357

Cutting Condition

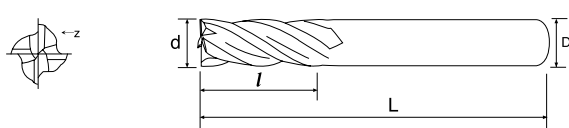
### Square Type - 4 flutes

## ■ 4刃立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 3            | 50          | 4              | 4      | P-UET0104          | .01        | .04   | .08   |
| 1.5          | 4            | 50          | 4              | 4      | P-UET0154          | .01        | .04   | .08   |
| 2            | 6            | 50          | 4              | 4      | P-UET0204          | .01        | .04   | .08   |
| 2.5          | 8            | 50          | 4              | 4      | P-UET0254          | .01        | .04   | .08   |
| 3            | 8            | 50          | 4              | 4      | P-UET0304          | .01        | .04   | .08   |
| 3.5          | 8            | 50          | 4              | 4      | P-UET0354          | .01        | .04   | .08   |
| 4            | 11           | 50          | 4              | 4      | P-UET0404          | .01        | .04   | .08   |
| 4.5          | 13           | 50          | 6              | 4      | P-UET0454          | .01        | .04   | .08   |
| 5            | 13           | 50          | 6              | 4      | P-UET0504          | .01        | .04   | .08   |
| 5.5          | 13           | 50          | 6              | 4      | P-UET0554          | .01        | .04   | .08   |
| 6            | 16           | 50          | 6              | 4      | P-UET0604          | .01        | .04   | .08   |
| 6.5          | 16           | 60          | 8              | 4      | P-UET0654          | .01        | .04   | .08   |
| 7            | 17           | 60          | 8              | 4      | P-UET0704          | .01        | .04   | .08   |
| 8            | 21           | 60          | 8              | 4      | P-UET0804          | .01        | .04   | .08   |
| 8            | 26           | 75          | 8              | 4      | P-UET0814          | .01        | .04   | .08   |
| 8.5          | 26           | 75          | 10             | 4      | P-UET0854          | .01        | .04   | .08   |
| 9            | 26           | 75          | 10             | 4      | P-UET0904          | .01        | .04   | .08   |
| 9.5          | 26           | 75          | 10             | 4      | P-UET0954          | .01        | .04   | .08   |
| 10           | 30           | 75          | 10             | 4      | P-UET1004          | .01        | .04   | .08   |
| 11           | 30           | 75          | 12             | 4      | P-UET1104          | .01        | .04   | .08   |
| 12           | 32           | 75          | 12             | 4      | P-UET1204          | .01        | .04   | .08   |
| 13           | 33           | 75          | 14             | 4      | P-UET1304          | .01        | .04   | .08   |
| 14           | 35           | 75          | 14             | 4      | P-UET1404          | .01        | .04   | .08   |
| 16           | 46           | 100         | 16             | 4      | P-UET1604          | .01        | .04   | .08   |
| 20           | 46           | 100         | 20             | 4      | P-UET2004          | .01        | .04   | .08   |
| 25           | 50           | 100         | 25             | 4      | P-UET2504          | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P358

Cutting Condition

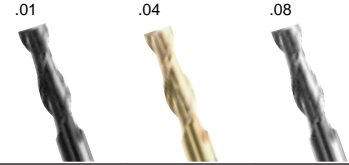
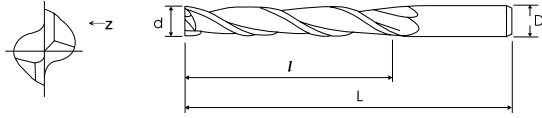
### Square Type - Long Flute - 2 flutes

## ■ 2刃長刃立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 5            | 50          | 4              | 2      | P-ULET0102         | .01        | .04   | .08   |
| 1.5          | 6            | 50          | 4              | 2      | P-ULET0152         | .01        | .04   | .08   |
| 2            | 8            | 50          | 6              | 2      | P-ULET0202         | .01        | .04   | .08   |
| 2.5          | 10           | 50          | 6              | 2      | P-ULET0252         | .01        | .04   | .08   |
| 3            | 12           | 60          | 6              | 2      | P-ULET0302         | .01        | .04   | .08   |
| 3.5          | 14           | 60          | 6              | 2      | P-ULET0352         | .01        | .04   | .08   |
| 4            | 16           | 60          | 6              | 2      | P-ULET0402         | .01        | .04   | .08   |
| 4.5          | 16           | 60          | 6              | 2      | P-ULET0452         | .01        | .04   | .08   |
| 5            | 20           | 60          | 6              | 2      | P-ULET0502         | .01        | .04   | .08   |
| 5.5          | 20           | 60          | 6              | 2      | P-ULET0552         | .01        | .04   | .08   |
| 6            | 25           | 75          | 6              | 2      | P-ULET0602         | .01        | .04   | .08   |
| 7            | 26           | 75          | 8              | 2      | P-ULET0702         | .01        | .04   | .08   |
| 8            | 26           | 75          | 8              | 2      | P-ULET0802         | .01        | .04   | .08   |
| 8            | 36           | 100         | 8              | 2      | P-ULET0812         | .01        | .04   | .08   |
| 10           | 40           | 100         | 10             | 2      | P-ULET1002         | .01        | .04   | .08   |
| 11           | 40           | 100         | 12             | 2      | P-ULET1102         | .01        | .04   | .08   |
| 12           | 46           | 100         | 12             | 2      | P-ULET1202         | .01        | .04   | .08   |
| 14           | 46           | 100         | 14             | 2      | P-ULET1402         | .01        | .04   | .08   |
| 15           | 46           | 100         | 16             | 2      | P-ULET1502         | .01        | .04   | .08   |
| 16           | 46           | 100         | 16             | 2      | P-ULET1602         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |



**400<sup>+</sup>** 切削條件表 **P359**  
Cutting Condition

## Square Type - Long Flute - 4 flutes

### ■ 4刃長刃立銑刀

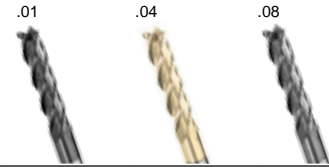
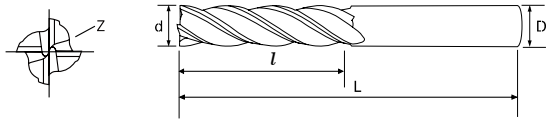
**400 PLUS**

**HRC ▶ 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 5            | 50          | 4              | 4      | P-ULET0104         | .01        | .04   | .08   |
| 1.5          | 6            | 50          | 4              | 4      | P-ULET0154         | .01        | .04   | .08   |
| 2            | 9            | 50          | 4              | 4      | P-ULET0204         | .01        | .04   | .08   |
| 2.5          | 10           | 50          | 4              | 4      | P-ULET0254         | .01        | .04   | .08   |
| 3            | 12           | 50          | 6              | 4      | P-ULET0304         | .01        | .04   | .08   |
| 3.5          | 14           | 50          | 6              | 4      | P-ULET0354         | .01        | .04   | .08   |
| 4            | 16           | 60          | 6              | 4      | P-ULET0404         | .01        | .04   | .08   |
| 4.5          | 18           | 60          | 6              | 4      | P-ULET0454         | .01        | .04   | .08   |
| 5            | 25           | 75          | 6              | 4      | P-ULET0504         | .01        | .04   | .08   |
| 6            | 25           | 75          | 6              | 4      | P-ULET0604         | .01        | .04   | .08   |
| 7            | 30           | 75          | 8              | 4      | P-ULET0704         | .01        | .04   | .08   |
| 8            | 35           | 100         | 8              | 4      | P-ULET0804         | .01        | .04   | .08   |
| 10           | 40           | 100         | 10             | 4      | P-ULET1004         | .01        | .04   | .08   |
| 12           | 45           | 100         | 12             | 4      | P-ULET1204         | .01        | .04   | .08   |
| 12           | 60           | 150         | 12             | 4      | P-ULET1214         | .01        | .04   | .08   |
| 14           | 45           | 100         | 14             | 4      | P-ULET1404         | .01        | .04   | .08   |
| 16           | 65           | 150         | 16             | 4      | P-ULET1604         | .01        | .04   | .08   |
| 20           | 75           | 150         | 20             | 4      | P-ULET2004         | .01        | .04   | .08   |
| 25           | 80           | 150         | 25             | 4      | P-ULET2504         | .01        | .04   | .08   |

HRC ▶ 40

HRC ▶ 45

HRC ▶ 50

HRC ▶ 55

**HRC ▶ 60**

HRC ▶ 65

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P360

Cutting Condition

Square Type - For Hard Material - Multiple Flutes

### 多刃高硬度用立銑刀

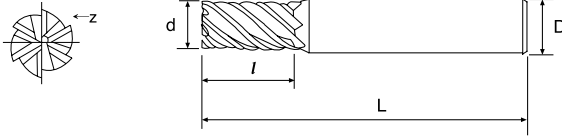
400 PLUS

HRC 60



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | I 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 2            | 4            | 50          | 4              | 4      | P-UVT0204          | .01        | .04   | .08   |
| 3            | 6            | 50          | 6              | 4      | P-UVT0304          | .01        | .04   | .08   |
| 4            | 8            | 50          | 6              | 4      | P-UVT0404          | .01        | .04   | .08   |
| 5            | 13           | 50          | 6              | 6      | P-UVT0506          | .01        | .04   | .08   |
| 6            | 15           | 50          | 6              | 6      | P-UVT0606          | .01        | .04   | .08   |
| 8            | 20           | 60          | 8              | 6      | P-UVT0806          | .01        | .04   | .08   |
| 10           | 30           | 75          | 10             | 6      | P-UVT1006          | .01        | .04   | .08   |
| 12           | 32           | 75          | 12             | 6      | P-UVT1206          | .01        | .04   | .08   |
| 16           | 40           | 100         | 16             | 6      | P-UVT1606          | .01        | .04   | .08   |
| 20           | 45           | 100         | 20             | 8      | P-UVT2008          | .01        | .04   | .08   |
| 25           | 45           | 100         | 25             | 8      | P-UVT2508          | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

## 400<sup>+</sup> 切削條件表 P360 Cutting Condition

### Square Type - Long Flute - Multiple Flutes

## ■ 多刃長刃強力立銑刀

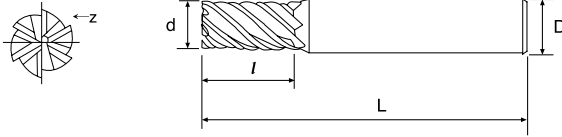
400 PLUS

HRC 60



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 25           | 75          | 6              | 6      | P-ULVT0606         | .01        | .04   | .08   |
| 8            | 30           | 75          | 8              | 6      | P-ULVT0806         | .01        | .04   | .08   |
| 10           | 40           | 100         | 10             | 6      | P-ULVT1006         | .01        | .04   | .08   |
| 12           | 45           | 100         | 12             | 6      | P-ULVT1206         | .01        | .04   | .08   |
| 16           | 65           | 150         | 16             | 6      | P-ULVT1606         | .01        | .04   | .08   |
| 20           | 75           | 150         | 20             | 8      | P-ULVT2008         | .01        | .04   | .08   |
| 25           | 80           | 150         | 25             | 8      | P-ULVT2508         | .01        | .04   | .08   |

HRC ▶ 40

HRC ▶ 45

HRC ▶ 50

HRC ▶ 55

HRC ▶ 60

HRC ▶ 65

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 2刃 切削條件表 P361 Cutting Condition  
 3刃 切削條件表 P362 Cutting Condition

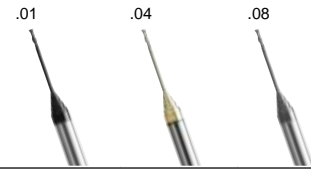
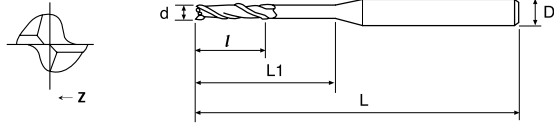
## Square Type - Long Neck - 2 & 3 flutes

### 2刃&3刃深溝長頸立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.5          | 0.75         | 2                | 50          | 4              | 2      | P-ULNT05022        | .01        | .04   | .08   |
| 0.5          | 0.75         | 4                | 50          | 4              | 2      | P-ULNT05042        | .01        | .04   | .08   |
| 0.5          | 0.75         | 6                | 50          | 4              | 2      | P-ULNT05062        | .01        | .04   | .08   |
| 0.6          | 0.9          | 2                | 50          | 4              | 2      | P-ULNT06022        | .01        | .04   | .08   |
| 1            | 1.5          | 6                | 50          | 4              | 3      | P-ULNT10063        | .01        | .04   | .08   |
| 1            | 1.5          | 8                | 50          | 4              | 3      | P-ULNT10083        | .01        | .04   | .08   |
| 1            | 1.5          | 10               | 50          | 4              | 3      | P-ULNT10103        | .01        | .04   | .08   |
| 1            | 1.5          | 12               | 50          | 4              | 3      | P-ULNT10123        | .01        | .04   | .08   |
| 1.5          | 2.3          | 6                | 50          | 4              | 3      | P-ULNT15063        | .01        | .04   | .08   |
| 1.5          | 2.3          | 8                | 50          | 4              | 3      | P-ULNT15083        | .01        | .04   | .08   |
| 1.5          | 2.3          | 10               | 50          | 4              | 3      | P-ULNT15103        | .01        | .04   | .08   |
| 1.5          | 2.3          | 12               | 50          | 4              | 3      | P-ULNT15123        | .01        | .04   | .08   |
| 1.5          | 2.3          | 14               | 50          | 4              | 3      | P-ULNT15143        | .01        | .04   | .08   |
| 1.5          | 2.3          | 16               | 50          | 4              | 3      | P-ULNT15163        | .01        | .04   | .08   |
| 1.5          | 2.3          | 18               | 50          | 4              | 3      | P-ULNT15183        | .01        | .04   | .08   |
| 1.5          | 2.3          | 20               | 50          | 4              | 3      | P-ULNT15203        | .01        | .04   | .08   |
| 2            | 3            | 6                | 50          | 4              | 3      | P-ULNT20063        | .01        | .04   | .08   |
| 2            | 3            | 8                | 50          | 4              | 3      | P-ULNT20083        | .01        | .04   | .08   |
| 2            | 3            | 10               | 50          | 4              | 3      | P-ULNT20103        | .01        | .04   | .08   |
| 2            | 3            | 12               | 50          | 4              | 3      | P-ULNT20123        | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 2刃 切削條件表 **P361** Cutting Condition  
 3刃 切削條件表 **P362** Cutting Condition

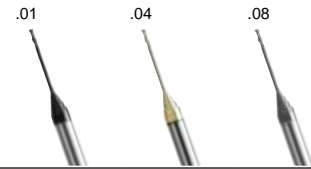
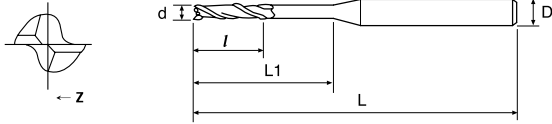
## Square Type - Long Neck - 3 flutes

### 3刃深溝長頸立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 2            | 3            | 14               | 50          | 4              | 3      | P-ULNT20143        | .01        | .04   | .08   |
| 2            | 3            | 16               | 50          | 4              | 3      | P-ULNT20163        | .01        | .04   | .08   |
| 2            | 3            | 18               | 50          | 4              | 3      | P-ULNT20183        | .01        | .04   | .08   |
| 2            | 3            | 20               | 50          | 4              | 3      | P-ULNT20203        | .01        | .04   | .08   |
| 2.5          | 4            | 8                | 50          | 4              | 3      | P-ULNT25083        | .01        | .04   | .08   |
| 2.5          | 4            | 12               | 50          | 4              | 3      | P-ULNT25123        | .01        | .04   | .08   |
| 2.5          | 4            | 16               | 50          | 4              | 3      | P-ULNT25163        | .01        | .04   | .08   |
| 2.5          | 4            | 20               | 50          | 4              | 3      | P-ULNT25203        | .01        | .04   | .08   |
| 3            | 4.5          | 10               | 50          | 6              | 3      | P-ULNT30103        | .01        | .04   | .08   |
| 3            | 4.5          | 12               | 50          | 6              | 3      | P-ULNT30123        | .01        | .04   | .08   |
| 3            | 4.5          | 16               | 60          | 6              | 3      | P-ULNT30163        | .01        | .04   | .08   |
| 3            | 4.5          | 20               | 60          | 6              | 3      | P-ULNT30203        | .01        | .04   | .08   |
| 3            | 4.5          | 25               | 75          | 6              | 3      | P-ULNT30253        | .01        | .04   | .08   |
| 4            | 6            | 12               | 50          | 6              | 3      | P-ULNT40123        | .01        | .04   | .08   |
| 4            | 6            | 16               | 60          | 6              | 3      | P-ULNT40163        | .01        | .04   | .08   |
| 4            | 6            | 20               | 75          | 6              | 3      | P-ULNT40203        | .01        | .04   | .08   |
| 4            | 6            | 25               | 75          | 6              | 3      | P-ULNT40253        | .01        | .04   | .08   |
| 4            | 6            | 30               | 75          | 6              | 3      | P-ULNT40303        | .01        | .04   | .08   |
| 4            | 6            | 35               | 75          | 6              | 3      | P-ULNT40353        | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |                     | ○                  |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P363

Cutting Condition

### Miniature Ball Nose Type - 2 flutes

## 2刃微小徑球型立銑刀

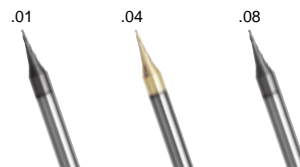
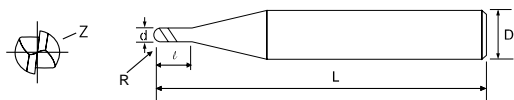
400 PLUS

HRC 60



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.3          | 0.15   | 0.6          | 38          | 3              | 2      | P-UMIB3032         | .01        | .04   | .08   |
| 0.4          | 0.2    | 0.7          | 38          | 3              | 2      | P-UMIB3042         | .01        | .04   | .08   |
| 0.5          | 0.25   | 0.8          | 38          | 3              | 2      | P-UMIB3052         | .01        | .04   | .08   |
| 0.6          | 0.3    | 0.9          | 38          | 3              | 2      | P-UMIB3062         | .01        | .04   | .08   |
| 0.7          | 0.35   | 1.4          | 38          | 3              | 2      | P-UMIB3072         | .01        | .04   | .08   |
| 0.8          | 0.4    | 1.6          | 38          | 3              | 2      | P-UMIB3082         | .01        | .04   | .08   |
| 0.9          | 0.45   | 1.8          | 38          | 3              | 2      | P-UMIB3092         | .01        | .04   | .08   |
| 1            | 0.5    | 2            | 38          | 3              | 2      | P-UMIB3102         | .01        | .04   | .08   |
| 1.1          | 0.55   | 2.2          | 38          | 3              | 2      | P-UMIB3112         | .01        | .04   | .08   |
| 1.2          | 0.6    | 2.4          | 38          | 3              | 2      | P-UMIB3122         | .01        | .04   | .08   |
| 1.3          | 0.65   | 2.6          | 38          | 3              | 2      | P-UMIB3132         | .01        | .04   | .08   |
| 1.4          | 0.7    | 2.8          | 38          | 3              | 2      | P-UMIB3142         | .01        | .04   | .08   |
| 1.5          | 0.75   | 3            | 38          | 3              | 2      | P-UMIB3152         | .01        | .04   | .08   |
| 1.6          | 0.8    | 3.2          | 38          | 3              | 2      | P-UMIB3162         | .01        | .04   | .08   |
| 1.7          | 0.85   | 3.4          | 38          | 3              | 2      | P-UMIB3172         | .01        | .04   | .08   |
| 1.8          | 0.9    | 3.6          | 38          | 3              | 2      | P-UMIB3182         | .01        | .04   | .08   |
| 1.9          | 0.95   | 3.8          | 38          | 3              | 2      | P-UMIB3192         | .01        | .04   | .08   |
| 2            | 1      | 4            | 38          | 3              | 2      | P-UMIB3202         | .01        | .04   | .08   |
| 2.1          | 1.05   | 4.2          | 38          | 3              | 2      | P-UMIB3212         | .01        | .04   | .08   |
| 2.2          | 1.1    | 4.4          | 38          | 3              | 2      | P-UMIB3222         | .01        | .04   | .08   |
| 2.3          | 1.15   | 4.6          | 38          | 3              | 2      | P-UMIB3232         | .01        | .04   | .08   |
| 2.4          | 1.2    | 4.8          | 38          | 3              | 2      | P-UMIB3242         | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 38          | 3              | 2      | P-UMIB3252         | .01        | .04   | .08   |
| 2.6          | 1.3    | 5.2          | 38          | 3              | 2      | P-UMIB3262         | .01        | .04   | .08   |
| 2.7          | 1.35   | 5.4          | 38          | 3              | 2      | P-UMIB3272         | .01        | .04   | .08   |
| 2.8          | 1.4    | 5.6          | 38          | 3              | 2      | P-UMIB3282         | .01        | .04   | .08   |
| 2.9          | 1.45   | 5.8          | 38          | 3              | 2      | P-UMIB3292         | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 38          | 3              | 2      | P-UMIB3302         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ○      | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P363**  
Cutting Condition

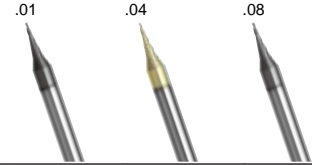
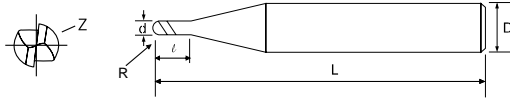
## Miniature Ball Nose Type - 2 flutes

### 2刃微小徑球型立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.3          | 0.15   | 0.6          | 50          | 4              | 2      | P-UMIB0032         | .01        | .04   | .08   |
| 0.4          | 0.2    | 0.7          | 50          | 4              | 2      | P-UMIB0042         | .01        | .04   | .08   |
| 0.5          | 0.25   | 0.8          | 50          | 4              | 2      | P-UMIB0052         | .01        | .04   | .08   |
| 0.6          | 0.3    | 0.9          | 50          | 4              | 2      | P-UMIB0062         | .01        | .04   | .08   |
| 0.7          | 0.35   | 1.4          | 50          | 4              | 2      | P-UMIB0072         | .01        | .04   | .08   |
| 0.8          | 0.4    | 1.6          | 50          | 4              | 2      | P-UMIB0082         | .01        | .04   | .08   |
| 0.9          | 0.45   | 1.8          | 50          | 4              | 2      | P-UMIB0092         | .01        | .04   | .08   |
| 1            | 0.5    | 2            | 50          | 4              | 2      | P-UMIB0102         | .01        | .04   | .08   |
| 1.1          | 0.55   | 2.2          | 50          | 4              | 2      | P-UMIB0112         | .01        | .04   | .08   |
| 1.2          | 0.6    | 2.4          | 50          | 4              | 2      | P-UMIB0122         | .01        | .04   | .08   |
| 1.3          | 0.65   | 2.6          | 50          | 4              | 2      | P-UMIB0132         | .01        | .04   | .08   |
| 1.4          | 0.7    | 2.8          | 50          | 4              | 2      | P-UMIB0142         | .01        | .04   | .08   |
| 1.5          | 0.75   | 3            | 50          | 4              | 2      | P-UMIB0152         | .01        | .04   | .08   |
| 1.6          | 0.8    | 3.2          | 50          | 4              | 2      | P-UMIB0162         | .01        | .04   | .08   |
| 1.7          | 0.85   | 3.4          | 50          | 4              | 2      | P-UMIB0172         | .01        | .04   | .08   |
| 1.8          | 0.9    | 3.6          | 50          | 4              | 2      | P-UMIB0182         | .01        | .04   | .08   |
| 1.9          | 0.95   | 3.8          | 50          | 4              | 2      | P-UMIB0192         | .01        | .04   | .08   |
| 2            | 1      | 4            | 50          | 4              | 2      | P-UMIB0202         | .01        | .04   | .08   |
| 2.1          | 1.05   | 4.2          | 50          | 4              | 2      | P-UMIB0212         | .01        | .04   | .08   |
| 2.2          | 1.1    | 4.4          | 50          | 4              | 2      | P-UMIB0222         | .01        | .04   | .08   |
| 2.3          | 1.15   | 4.6          | 50          | 4              | 2      | P-UMIB0232         | .01        | .04   | .08   |
| 2.4          | 1.2    | 4.8          | 50          | 4              | 2      | P-UMIB0242         | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 50          | 4              | 2      | P-UMIB0252         | .01        | .04   | .08   |
| 2.6          | 1.3    | 5.2          | 50          | 4              | 2      | P-UMIB0262         | .01        | .04   | .08   |
| 2.7          | 1.35   | 5.4          | 50          | 4              | 2      | P-UMIB0272         | .01        | .04   | .08   |
| 2.8          | 1.4    | 5.6          | 50          | 4              | 2      | P-UMIB0282         | .01        | .04   | .08   |
| 2.9          | 1.45   | 5.8          | 50          | 4              | 2      | P-UMIB0292         | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 50          | 4              | 2      | P-UMIB0302         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P364**  
Cutting Condition

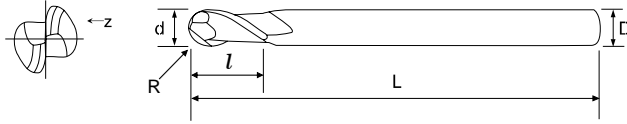
## Ball Nose Type - 2 flutes

### 2刃球型立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.5    | 2            | 50          | 4              | 2      | P-UBT0102          | .01        | .04   | .08   |
| 1.5          | 0.75   | 3            | 50          | 4              | 2      | P-UBT0152          | .01        | .04   | .08   |
| 2            | 1      | 4            | 50          | 4              | 2      | P-UBT0202          | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 50          | 4              | 2      | P-UBT0252          | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 50          | 4              | 2      | P-UBT0302          | .01        | .04   | .08   |
| 3.5          | 1.75   | 7            | 50          | 4              | 2      | P-UBT0352          | .01        | .04   | .08   |
| 4            | 2      | 8            | 50          | 4              | 2      | P-UBT0402          | .01        | .04   | .08   |
| 4.5          | 2.25   | 9            | 50          | 6              | 2      | P-UBT0452          | .01        | .04   | .08   |
| 5            | 2.5    | 10           | 50          | 6              | 2      | P-UBT0502          | .01        | .04   | .08   |
| 5.5          | 2.75   | 11           | 50          | 6              | 2      | P-UBT0552          | .01        | .04   | .08   |
| 6            | 3      | 12           | 50          | 6              | 2      | P-UBT0602          | .01        | .04   | .08   |
| 7            | 3.5    | 14           | 60          | 8              | 2      | P-UBT0702          | .01        | .04   | .08   |
| 8            | 4      | 16           | 60          | 8              | 2      | P-UBT0802          | .01        | .04   | .08   |
| 8            | 4      | 16           | 75          | 8              | 2      | P-UBT0812          | .01        | .04   | .08   |
| 9            | 4.5    | 18           | 75          | 10             | 2      | P-UBT0902          | .01        | .04   | .08   |
| 10           | 5      | 20           | 75          | 10             | 2      | P-UBT1002          | .01        | .04   | .08   |
| 12           | 6      | 24           | 75          | 12             | 2      | P-UBT1202          | .01        | .04   | .08   |
| 14           | 7      | 28           | 75          | 14             | 2      | P-UBT1402          | .01        | .04   | .08   |
| 16           | 8      | 32           | 100         | 16             | 2      | P-UBT1602          | .01        | .04   | .08   |
| 20           | 10     | 40           | 150         | 20             | 2      | P-UBT2002          | .01        | .04   | .08   |
| 25           | 12.5   | 45           | 150         | 25             | 2      | P-UBT2502          | .01        | .04   | .08   |

**R** High precision radius accuracy request is available  
+0.003 高精度R值可訂製

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ○ |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |   | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ◎ | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm



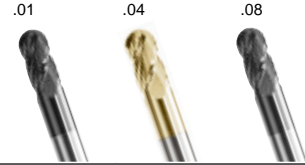
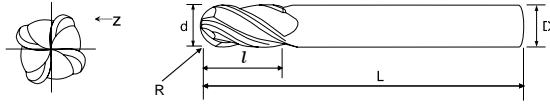
**400<sup>+</sup>** 切削條件表 **P364**  
Cutting Condition

## Ball Nose Type - 4 flutes ■ 4刃球型立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.5    | 2            | 50          | 4              | 4      | P-UBT0104          | .01        | .04   | .08   |
| 2            | 1      | 4            | 50          | 4              | 4      | P-UBT0204          | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 50          | 4              | 4      | P-UBT0254          | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 50          | 4              | 4      | P-UBT0304          | .01        | .04   | .08   |
| 4            | 2      | 8            | 50          | 4              | 4      | P-UBT0404          | .01        | .04   | .08   |
| 4.5          | 2.25   | 9            | 50          | 6              | 4      | P-UBT0454          | .01        | .04   | .08   |
| 5            | 2.5    | 10           | 50          | 6              | 4      | P-UBT0504          | .01        | .04   | .08   |
| 6            | 3      | 12           | 50          | 6              | 4      | P-UBT0604          | .01        | .04   | .08   |
| 7            | 3.5    | 14           | 60          | 8              | 4      | P-UBT0704          | .01        | .04   | .08   |
| 8            | 4      | 16           | 60          | 8              | 4      | P-UBT0804          | .01        | .04   | .08   |
| 8            | 4      | 16           | 75          | 8              | 4      | P-UBT0814          | .01        | .04   | .08   |
| 10           | 5      | 20           | 75          | 10             | 4      | P-UBT1004          | .01        | .04   | .08   |
| 12           | 6      | 24           | 75          | 12             | 4      | P-UBT1204          | .01        | .04   | .08   |
| 14           | 7      | 28           | 100         | 14             | 4      | P-UBT1404          | .01        | .04   | .08   |
| 16           | 8      | 32           | 100         | 16             | 4      | P-UBT1604          | .01        | .04   | .08   |
| 20           | 10     | 40           | 150         | 20             | 4      | P-UBT2004          | .01        | .04   | .08   |
| 25           | 12.5   | 50           | 150         | 25             | 4      | P-UBT2504          | .01        | .04   | .08   |

### Long Shank - 長柄

| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 3      | 12           | 75          | 6              | 4      | P-ULBT0604         | .01        | .04   | .08   |
| 8            | 4      | 16           | 100         | 8              | 4      | P-ULBT0804         | .01        | .04   | .08   |
| 10           | 5      | 20           | 100         | 10             | 4      | P-ULBT1004         | .01        | .04   | .08   |
| 12           | 6      | 24           | 100         | 12             | 4      | P-ULBT1204         | .01        | .04   | .08   |
| 16           | 8      | 32           | 150         | 16             | 4      | P-ULBT1604         | .01        | .04   | .08   |

**R** High precision radius accuracy request is available  
±0.003 高精度R值可訂製

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P365**  
Cutting Condition

## Ball Nose Type - Short Flute - 2 flutes

### 2刃強力短刃球型立銑刀

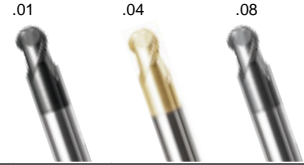
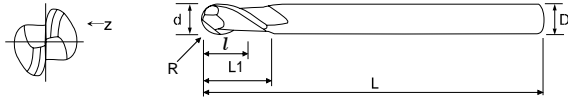
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.5    | 1            | 2.5              | 50          | 4              | 2      | P-UBTSX010         | .01        | .04   | .08   |
| 1.5          | 0.75   | 1.5          | 4                | 50          | 4              | 2      | P-UBTSX015         | .01        | .04   | .08   |
| 2            | 1      | 2            | 5                | 50          | 4              | 2      | P-UBTSX020         | .01        | .04   | .08   |
| 2.5          | 1.25   | 2.5          | 6                | 50          | 4              | 2      | P-UBTSX025         | .01        | .04   | .08   |
| 3            | 1.5    | 3            | 8                | 50          | 4              | 2      | P-UBTSX030         | .01        | .04   | .08   |
| 3.5          | 1.75   | 3.5          | 8                | 50          | 4              | 2      | P-UBTSX035         | .01        | .04   | .08   |
| 3            | 1.5    | 3            | 8                | 50          | 6              | 2      | P-UBTSX036         | .01        | .04   | .08   |
| 4            | 2      | 4            | 10               | 50          | 4              | 2      | P-UBTSX044         | .01        | .04   | .08   |
| 4.5          | 2.25   | 4.5          | 11               | 50          | 6              | 2      | P-UBTSX045         | .01        | .04   | .08   |
| 4            | 2      | 4            | 10               | 50          | 6              | 2      | P-UBTSX046         | .01        | .04   | .08   |
| 5            | 2.5    | 5            | 13               | 50          | 6              | 2      | P-UBTSX050         | .01        | .04   | .08   |
| 5.5          | 2.75   | 5.5          | 14               | 50          | 6              | 2      | P-UBTSX055         | .01        | .04   | .08   |
| 6            | 3      | 6            | 15               | 50          | 6              | 2      | P-UBTSX060         | .01        | .04   | .08   |
| 7            | 3.5    | 7            | 16               | 60          | 8              | 2      | P-UBTSX070         | .01        | .04   | .08   |
| 8            | 4      | 8            | 20               | 60          | 8              | 2      | P-UBTSX080         | .01        | .04   | .08   |
| 9            | 4.5    | 9            | 22               | 75          | 10             | 2      | P-UBTSX090         | .01        | .04   | .08   |
| 10           | 5      | 10           | 25               | 75          | 10             | 2      | P-UBTSX100         | .01        | .04   | .08   |
| 12           | 6      | 12           | 30               | 75          | 12             | 2      | P-UBTSX120         | .01        | .04   | .08   |
| 14           | 7      | 14           | 35               | 75          | 16             | 2      | P-UBTSX140         | .01        | .04   | .08   |
| 16           | 8      | 16           | 40               | 100         | 16             | 2      | P-UBTSX160         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

**400<sup>+</sup>** 切削條件表 **P365**  
Cutting Condition

## Ball Nose Type - Long Shank - 2 flutes

### 2刃長柄球型立銑刀

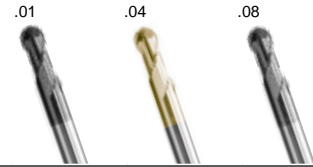
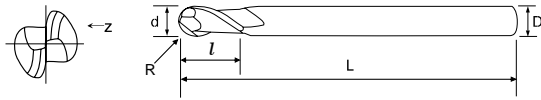
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.5    | 2            | 75          | 6              | 2      | P-ULBTS0102        | .01        | .04   | .08   |
| 1.5          | 0.75   | 3            | 75          | 6              | 2      | P-ULBTS0152        | .01        | .04   | .08   |
| 2            | 1      | 4            | 75          | 6              | 2      | P-ULBTS0202        | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 75          | 6              | 2      | P-ULBTS0252        | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 75          | 6              | 2      | P-ULBTS0302        | .01        | .04   | .08   |
| 3.5          | 1.75   | 7            | 75          | 6              | 2      | P-ULBTS0352        | .01        | .04   | .08   |
| 4            | 2      | 8            | 75          | 6              | 2      | P-ULBTS0402        | .01        | .04   | .08   |
| 4.5          | 2.25   | 9            | 75          | 6              | 2      | P-ULBTS0452        | .01        | .04   | .08   |
| 5            | 2.5    | 10           | 75          | 6              | 2      | P-ULBTS0502        | .01        | .04   | .08   |
| 5.5          | 2.75   | 11           | 75          | 6              | 2      | P-ULBTS0552        | .01        | .04   | .08   |
| 6            | 3      | 12           | 75          | 6              | 2      | P-ULBTS0602        | .01        | .04   | .08   |
| 7            | 3.5    | 14           | 75          | 8              | 2      | P-ULBTS0702        | .01        | .04   | .08   |
| 8            | 4      | 16           | 100         | 8              | 2      | P-ULBTS0802        | .01        | .04   | .08   |
| 9            | 4.5    | 18           | 100         | 10             | 2      | P-ULBTS0902        | .01        | .04   | .08   |
| 10           | 5      | 20           | 100         | 10             | 2      | P-ULBTS1002        | .01        | .04   | .08   |
| 12           | 6      | 24           | 100         | 12             | 2      | P-ULBTS1202        | .01        | .04   | .08   |
| 14           | 7      | 28           | 100         | 14             | 2      | P-ULBTS1402        | .01        | .04   | .08   |
| 16           | 8      | 32           | 150         | 16             | 2      | P-ULBTS1602        | .01        | .04   | .08   |
| 6            | 3      | 12           | 100         | 6              | 2      | P-ULBTM0602        | .01        | .04   | .08   |
| 8            | 4      | 16           | 150         | 8              | 2      | P-ULBTM0802        | .01        | .04   | .08   |
| 10           | 5      | 20           | 150         | 10             | 2      | P-ULBTM1002        | .01        | .04   | .08   |
| 12           | 6      | 24           | 150         | 12             | 2      | P-ULBTM1202        | .01        | .04   | .08   |
| 16           | 8      | 32           | 200         | 16             | 2      | P-ULBTM1602        | .01        | .04   | .08   |
| 6            | 3      | 12           | 150         | 6              | 2      | P-ULBTL0602        | .01        | .04   | .08   |
| 20           | 10     | 40           | 200         | 20             | 2      | P-ULBTL2002        | .01        | .04   | .08   |
| 25           | 12.5   | 45           | 200         | 25             | 2      | P-ULBTL2502        | .01        | .04   | .08   |

HRC ▶ 40

HRC ▶ 45

HRC ▶ 50

HRC ▶ 55

**HRC ▶ 60**

HRC ▶ 65



★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P366-367

Cutting Condition

### Ball Nose Type - Long Neck - 2 flutes

## 2刃深溝長頸球型立銑刀

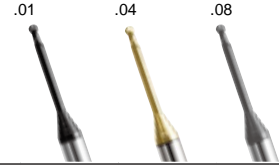
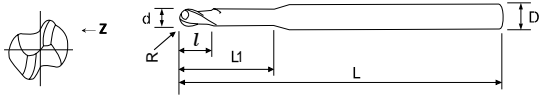
400 PLUS

HRC 60



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | L 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 0.5          | 0.25   | 0.75         | 2                | 50          | 4              | 2      | P-ULNBT05022       | .01        | .04   | .08   |
| 0.5          | 0.25   | 0.75         | 4                | 50          | 4              | 2      | P-ULNBT05042       | .01        | .04   | .08   |
| 0.5          | 0.25   | 0.75         | 6                | 50          | 4              | 2      | P-ULNBT05062       | .01        | .04   | .08   |
| 0.6          | 0.3    | 0.9          | 2                | 50          | 4              | 2      | P-ULNBT06022       | .01        | .04   | .08   |
| 0.6          | 0.3    | 0.9          | 4                | 50          | 4              | 2      | P-ULNBT06042       | .01        | .04   | .08   |
| 0.6          | 0.3    | 0.9          | 6                | 50          | 4              | 2      | P-ULNBT06062       | .01        | .04   | .08   |
| 0.8          | 0.4    | 1.2          | 4                | 50          | 4              | 2      | P-ULNBT08042       | .01        | .04   | .08   |
| 0.8          | 0.4    | 1.2          | 6                | 50          | 4              | 2      | P-ULNBT08062       | .01        | .04   | .08   |
| 0.8          | 0.4    | 1.2          | 8                | 50          | 4              | 2      | P-ULNBT08082       | .01        | .04   | .08   |
| 1            | 0.5    | 1.5          | 6                | 50          | 4              | 2      | P-ULNBT10062       | .01        | .04   | .08   |
| 1            | 0.5    | 1.5          | 8                | 50          | 4              | 2      | P-ULNBT10082       | .01        | .04   | .08   |
| 1            | 0.5    | 1.5          | 10               | 50          | 4              | 2      | P-ULNBT10102       | .01        | .04   | .08   |
| 1            | 0.5    | 1.5          | 12               | 50          | 4              | 2      | P-ULNBT10122       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 6                | 50          | 4              | 2      | P-ULNBT15062       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 8                | 50          | 4              | 2      | P-ULNBT15082       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 10               | 50          | 4              | 2      | P-ULNBT15102       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 12               | 50          | 4              | 2      | P-ULNBT15122       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 14               | 50          | 4              | 2      | P-ULNBT15142       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 16               | 50          | 4              | 2      | P-ULNBT15162       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 18               | 50          | 4              | 2      | P-ULNBT15182       | .01        | .04   | .08   |
| 1.5          | 0.75   | 2.3          | 20               | 50          | 4              | 2      | P-ULNBT15202       | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

**400<sup>+</sup>** 切削條件表 **P366-367**  
Cutting Condition

## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀

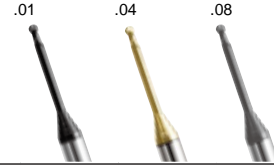
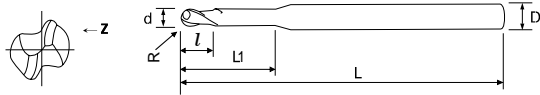
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 2            | 1      | 3            | 8                | 50          | 4              | 2      | P-ULNBT20082       | .01        | .04   | .08   |
| 2            | 1      | 3            | 10               | 50          | 4              | 2      | P-ULNBT20102       | .01        | .04   | .08   |
| 2            | 1      | 3            | 12               | 50          | 4              | 2      | P-ULNBT20122       | .01        | .04   | .08   |
| 2            | 1      | 3            | 14               | 50          | 4              | 2      | P-ULNBT20142       | .01        | .04   | .08   |
| 2            | 1      | 3            | 16               | 50          | 4              | 2      | P-ULNBT20162       | .01        | .04   | .08   |
| 2            | 1      | 3            | 18               | 50          | 4              | 2      | P-ULNBT20182       | .01        | .04   | .08   |
| 2            | 1      | 3            | 20               | 50          | 4              | 2      | P-ULNBT20202       | .01        | .04   | .08   |
| 2.5          | 1.25   | 4            | 8                | 50          | 4              | 2      | P-ULNBT25082       | .01        | .04   | .08   |
| 2.5          | 1.25   | 4            | 12               | 50          | 4              | 2      | P-ULNBT25122       | .01        | .04   | .08   |
| 2.5          | 1.25   | 4            | 16               | 50          | 4              | 2      | P-ULNBT25162       | .01        | .04   | .08   |
| 2.5          | 1.25   | 4            | 20               | 50          | 4              | 2      | P-ULNBT25202       | .01        | .04   | .08   |
| 3            | 1.5    | 4.5          | 10               | 50          | 6              | 2      | P-ULNBT30102       | .01        | .04   | .08   |
| 3            | 1.5    | 4.5          | 12               | 50          | 6              | 2      | P-ULNBT30122       | .01        | .04   | .08   |
| 3            | 1.5    | 4.5          | 16               | 60          | 6              | 2      | P-ULNBT30162       | .01        | .04   | .08   |
| 3            | 1.5    | 4.5          | 20               | 60          | 6              | 2      | P-ULNBT30202       | .01        | .04   | .08   |
| 3            | 1.5    | 4.5          | 25               | 75          | 6              | 2      | P-ULNBT30252       | .01        | .04   | .08   |
| 4            | 2      | 6            | 12               | 50          | 6              | 2      | P-ULNBT40122       | .01        | .04   | .08   |
| 4            | 2      | 6            | 16               | 60          | 6              | 2      | P-ULNBT40162       | .01        | .04   | .08   |
| 4            | 2      | 6            | 20               | 75          | 6              | 2      | P-ULNBT40202       | .01        | .04   | .08   |
| 4            | 2      | 6            | 25               | 75          | 6              | 2      | P-ULNBT40252       | .01        | .04   | .08   |
| 4            | 2      | 6            | 30               | 75          | 6              | 2      | P-ULNBT40302       | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

# 400<sup>+</sup>

切削條件表 **P368**  
Cutting Condition

## Pencil Neck Ball Nose Type - 2 flutes

### 2刃深溝斜頸球型立銑刀

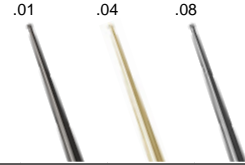
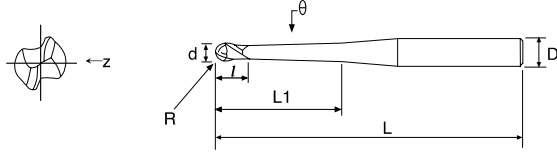
400 PLUS

HRC 60



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |       |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|-------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Bevel | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | θ 斜度  | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.5    | 2            | 20               | 75          | 6              | 1.5°  | 2      | P-UPBT101520       | .01        | .04   | .08   |
| 1.5          | 0.75   | 3            | 20               | 75          | 6              | 1.5°  | 2      | P-UPBT151520       | .01        | .04   | .08   |
| 2            | 1      | 4            | 25               | 75          | 6              | 1°    | 2      | P-UPBT201025       | .01        | .04   | .08   |
| 2.5          | 1.25   | 5            | 25               | 75          | 6              | 1°    | 2      | P-UPBT251025       | .01        | .04   | .08   |
| 3            | 1.5    | 6            | 30               | 75          | 6              | 1°    | 2      | P-UPBT301030       | .01        | .04   | .08   |
| 4            | 2      | 7            | 35               | 75          | 6              | 1°    | 2      | P-UPBT401035       | .01        | .04   | .08   |
| 4            | 2      | 7            | 45               | 150         | 8              | 2.5°  | 2      | P-UPBT402545       | .01        | .04   | .08   |
| 5            | 2.5    | 9            | 50               | 150         | 10             | 2.5°  | 2      | P-UPBT502550       | .01        | .04   | .08   |
| 6            | 3      | 10           | 38               | 150         | 10             | 3°    | 2      | P-UPBT603038       | .01        | .04   | .08   |
| 8            | 4      | 13           | 38               | 150         | 12             | 3°    | 2      | P-UPBT803038       | .01        | .04   | .08   |
| 10           | 5      | 16           | 42               | 150         | 16             | 4°    | 2      | P-UPBT904042       | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |                     | ○                  |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ◎                   | ○                  | ○                         |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P368**  
Cutting Condition

## Pencil Neck Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長斜頸球型立銑刀

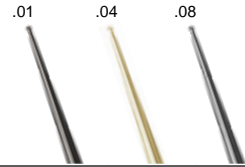
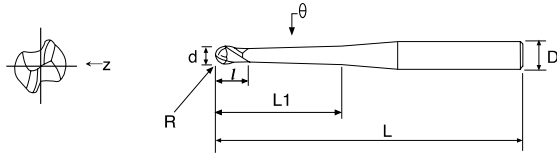
**400 PLUS**

**HRC 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |       |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|-------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Bevel | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | 刃長           | L1 有效長           | L 全長        | D 柄徑           | θ 斜度  | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 2            | 1      | 3            | 60               | 100         | 6              | 0.5°  | 2      | P-ULPBT200560      | .01        | .04   | .08   |
| 2            | 1      | 3            | 60               | 100         | 6              | 1°    | 2      | P-ULPBT201060      | .01        | .04   | .08   |
| 2            | 1      | 3            | 60               | 100         | 6              | 1.5°  | 2      | P-ULPBT201560      | .01        | .04   | .08   |
| 2            | 1      | 3            | 57               | 100         | 6              | 2°    | 2      | P-ULPBT202057      | .01        | .04   | .08   |
| 3            | 1.5    | 4            | 60               | 100         | 6              | 0.5°  | 2      | P-ULPBT300560      | .01        | .04   | .08   |
| 3            | 1.5    | 4            | 60               | 100         | 6              | 1°    | 2      | P-ULPBT301060      | .01        | .04   | .08   |
| 3            | 1.5    | 4            | 57               | 100         | 6              | 1.5°  | 2      | P-ULPBT301557      | .01        | .04   | .08   |
| 3            | 1.5    | 4            | 43               | 100         | 6              | 2°    | 2      | P-ULPBT302043      | .01        | .04   | .08   |
| 4            | 2      | 5            | 60               | 100         | 6              | 0.5°  | 2      | P-ULPBT400560      | .01        | .04   | .08   |
| 4            | 2      | 5            | 57               | 100         | 6              | 1°    | 2      | P-ULPBT401057      | .01        | .04   | .08   |
| 4            | 2      | 5            | 38               | 100         | 6              | 1.5°  | 2      | P-ULPBT401538      | .01        | .04   | .08   |
| 4            | 2      | 5            | 29               | 100         | 6              | 2°    | 2      | P-ULPBT402029      | .01        | .04   | .08   |

HRC 40

HRC 45

HRC 50

HRC 55

**HRC 60**

HRC 65

Application 適用材質：

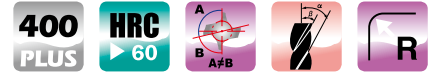
★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

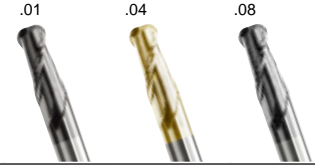
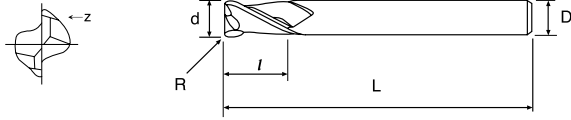
**400<sup>+</sup>** 切削條件表 **P369**  
Cutting Condition

## Corner Radius Type - 2 flutes ■ 2刃圓鼻立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.2    | 2            | 50          | 4              | 2      | P-URTA010022       | .01        | .04   | .08   |
| 1            | 0.3    | 2            | 50          | 4              | 2      | P-URTA010032       | .01        | .04   | .08   |
| 1.5          | 0.2    | 3            | 50          | 4              | 2      | P-URTA015022       | .01        | .04   | .08   |
| 1.5          | 0.3    | 3            | 50          | 4              | 2      | P-URTA015032       | .01        | .04   | .08   |
| 2            | 0.2    | 5            | 50          | 4              | 2      | P-URTA020022       | .01        | .04   | .08   |
| 2            | 0.3    | 5            | 50          | 4              | 2      | P-URTA020032       | .01        | .04   | .08   |
| 2            | 0.5    | 5            | 50          | 4              | 2      | P-URTA020052       | .01        | .04   | .08   |
| 3            | 0.2    | 8            | 50          | 4              | 2      | P-URTA030022       | .01        | .04   | .08   |
| 3            | 0.3    | 8            | 50          | 4              | 2      | P-URTA030032       | .01        | .04   | .08   |
| 3            | 0.5    | 8            | 50          | 4              | 2      | P-URTA030052       | .01        | .04   | .08   |
| 4            | 0.2    | 10           | 50          | 4              | 2      | P-URTA040022       | .01        | .04   | .08   |
| 4            | 0.3    | 10           | 50          | 4              | 2      | P-URTA040032       | .01        | .04   | .08   |
| 4            | 0.5    | 10           | 50          | 4              | 2      | P-URTA040052       | .01        | .04   | .08   |
| 4            | 1      | 10           | 50          | 4              | 2      | P-URTA040102       | .01        | .04   | .08   |
| 5            | 0.3    | 13           | 50          | 6              | 2      | P-URTA050032       | .01        | .04   | .08   |
| 5            | 0.5    | 13           | 50          | 6              | 2      | P-URTA050052       | .01        | .04   | .08   |
| 5            | 1      | 13           | 50          | 6              | 2      | P-URTA050102       | .01        | .04   | .08   |
| 6            | 0.2    | 16           | 75          | 6              | 2      | P-URTA060022       | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm



**400<sup>+</sup>** 切削條件表 **P369**  
Cutting Condition

## Corner Radius Type - 2 flutes

### 2刃圓鼻立銑刀

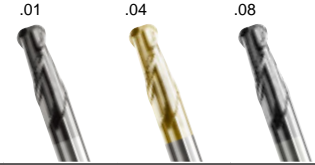
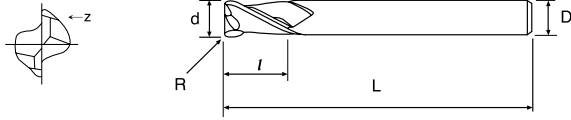
**400 PLUS**

**HRC ▶ 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 0.3    | 16           | 75          | 6              | 2      | P-URTA060032       | .01        | .04   | .08   |
| 6            | 0.5    | 16           | 75          | 6              | 2      | P-URTA060052       | .01        | .04   | .08   |
| 6            | 1      | 16           | 75          | 6              | 2      | P-URTA060102       | .01        | .04   | .08   |
| 6            | 2      | 16           | 75          | 6              | 2      | P-URTA060202       | .01        | .04   | .08   |
| 8            | 0.3    | 20           | 75          | 8              | 2      | P-URTA080032       | .01        | .04   | .08   |
| 8            | 0.5    | 20           | 75          | 8              | 2      | P-URTA080052       | .01        | .04   | .08   |
| 8            | 1      | 20           | 75          | 8              | 2      | P-URTA080102       | .01        | .04   | .08   |
| 8            | 2      | 20           | 75          | 8              | 2      | P-URTA080202       | .01        | .04   | .08   |
| 10           | 0.5    | 25           | 75          | 10             | 2      | P-URTA100052       | .01        | .04   | .08   |
| 10           | 1      | 25           | 75          | 10             | 2      | P-URTA100102       | .01        | .04   | .08   |
| 10           | 1.5    | 25           | 75          | 10             | 2      | P-URTA100152       | .01        | .04   | .08   |
| 10           | 2      | 25           | 75          | 10             | 2      | P-URTA100202       | .01        | .04   | .08   |
| 10           | 3      | 25           | 75          | 10             | 2      | P-URTA100302       | .01        | .04   | .08   |
| 12           | 0.5    | 30           | 75          | 12             | 2      | P-URTA120052       | .01        | .04   | .08   |
| 12           | 1      | 30           | 75          | 12             | 2      | P-URTA120102       | .01        | .04   | .08   |
| 12           | 1.5    | 30           | 75          | 12             | 2      | P-URTA120152       | .01        | .04   | .08   |
| 12           | 2      | 30           | 75          | 12             | 2      | P-URTA120202       | .01        | .04   | .08   |
| 12           | 3      | 30           | 75          | 12             | 2      | P-URTA120302       | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P370**  
Cutting Condition

## Corner Radius Type - 4 flutes ■ 4刃圓鼻立銑刀

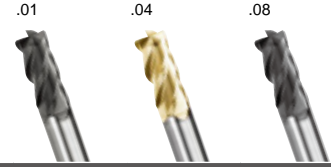
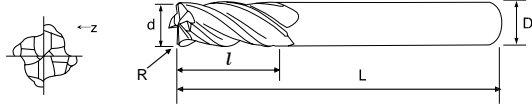
**400 PLUS**

**HRC ▶ 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 3            | 0.3    | 8            | 50          | 3              | 4      | P-URTA03034        | .01        | .04   | .08   |
| 3            | 0.5    | 8            | 50          | 3              | 4      | P-URTA03054        | .01        | .04   | .08   |
| 3            | 1      | 8            | 50          | 3              | 4      | P-URTA03104        | .01        | .04   | .08   |
| 4            | 0.2    | 10           | 50          | 4              | 4      | P-URTA04024        | .01        | .04   | .08   |
| 4            | 0.3    | 10           | 50          | 4              | 4      | P-URTA04034        | .01        | .04   | .08   |
| 4            | 0.5    | 10           | 50          | 4              | 4      | P-URTA04054        | .01        | .04   | .08   |
| 4            | 1      | 10           | 50          | 4              | 4      | P-URTA04104        | .01        | .04   | .08   |
| 5            | 0.3    | 13           | 75          | 6              | 4      | P-URTA05034        | .01        | .04   | .08   |
| 5            | 0.5    | 13           | 75          | 6              | 4      | P-URTA05054        | .01        | .04   | .08   |
| 5            | 1      | 13           | 75          | 6              | 4      | P-URTA05104        | .01        | .04   | .08   |
| 6            | 0.2    | 16           | 75          | 6              | 4      | P-URTA06024        | .01        | .04   | .08   |
| 6            | 0.3    | 16           | 75          | 6              | 4      | P-URTA06034        | .01        | .04   | .08   |
| 6            | 0.5    | 16           | 75          | 6              | 4      | P-URTA06054        | .01        | .04   | .08   |
| 6            | 1      | 16           | 75          | 6              | 4      | P-URTA06104        | .01        | .04   | .08   |
| 6            | 2      | 16           | 75          | 6              | 4      | P-URTA06204        | .01        | .04   | .08   |
| 8            | 0.3    | 20           | 75          | 8              | 4      | P-URTA08034        | .01        | .04   | .08   |
| 8            | 0.5    | 20           | 75          | 8              | 4      | P-URTA08054        | .01        | .04   | .08   |
| 8            | 1      | 20           | 75          | 8              | 4      | P-URTA08104        | .01        | .04   | .08   |
| 8            | 2      | 20           | 75          | 8              | 4      | P-URTA08204        | .01        | .04   | .08   |
| 10           | 0.5    | 25           | 75          | 10             | 4      | P-URTA10054        | .01        | .04   | .08   |
| 10           | 1      | 25           | 75          | 10             | 4      | P-URTA10104        | .01        | .04   | .08   |
| 10           | 1.5    | 25           | 75          | 10             | 4      | P-URTA10154        | .01        | .04   | .08   |
| 10           | 2      | 25           | 75          | 10             | 4      | P-URTA10204        | .01        | .04   | .08   |
| 10           | 3      | 25           | 75          | 10             | 4      | P-URTA10304        | .01        | .04   | .08   |
| 12           | 0.5    | 30           | 75          | 12             | 4      | P-URTA12054        | .01        | .04   | .08   |
| 12           | 1      | 30           | 75          | 12             | 4      | P-URTA12104        | .01        | .04   | .08   |
| 12           | 1.5    | 30           | 75          | 12             | 4      | P-URTA12154        | .01        | .04   | .08   |
| 12           | 2      | 30           | 75          | 12             | 4      | P-URTA12204        | .01        | .04   | .08   |
| 12           | 3      | 30           | 75          | 12             | 4      | P-URTA12304        | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ○      | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P371**  
Cutting Condition

## Pencil Neck Corner Radius Type - 2 flutes

### 2刃斜頸圓鼻立銑刀

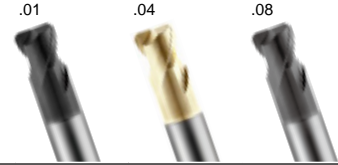
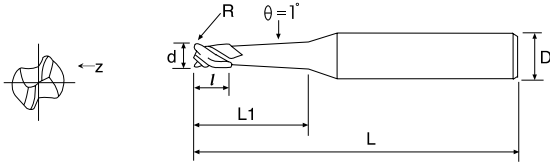
**400 PLUS**

**HRC > 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 1            | 0.2    | 1            | 3                | 50          | 4              | 2      | P-UCRS010022       | .01        | .04   | .08   |
| 1.5          | 0.2    | 1.5          | 4.5              | 50          | 4              | 2      | P-UCRS015022       | .01        | .04   | .08   |
| 1.5          | 0.3    | 1.5          | 4.5              | 50          | 4              | 2      | P-UCRS015032       | .01        | .04   | .08   |
| 2            | 0.2    | 2            | 6                | 50          | 4              | 2      | P-UCRS020022       | .01        | .04   | .08   |
| 2            | 0.3    | 2            | 6                | 50          | 4              | 2      | P-UCRS020032       | .01        | .04   | .08   |
| 2            | 0.5    | 2            | 6                | 50          | 4              | 2      | P-UCRS020052       | .01        | .04   | .08   |
| 3            | 0.2    | 3            | 9                | 50          | 6              | 2      | P-UCRS030022       | .01        | .04   | .08   |
| 3            | 0.3    | 3            | 9                | 50          | 6              | 2      | P-UCRS030032       | .01        | .04   | .08   |
| 3            | 0.5    | 3            | 9                | 50          | 6              | 2      | P-UCRS030052       | .01        | .04   | .08   |
| 3            | 1      | 3            | 9                | 50          | 6              | 2      | P-UCRS030102       | .01        | .04   | .08   |
| 4            | 0.2    | 4            | 12               | 50          | 6              | 2      | P-UCRS040022       | .01        | .04   | .08   |
| 4            | 0.3    | 4            | 12               | 50          | 6              | 2      | P-UCRS040032       | .01        | .04   | .08   |
| 4            | 0.5    | 4            | 12               | 50          | 6              | 2      | P-UCRS040052       | .01        | .04   | .08   |
| 4            | 1      | 4            | 12               | 50          | 6              | 2      | P-UCRS040102       | .01        | .04   | .08   |
| 5            | 0.3    | 5            | 15               | 50          | 6              | 2      | P-UCRS050032       | .01        | .04   | .08   |
| 5            | 0.5    | 5            | 15               | 50          | 6              | 2      | P-UCRS050052       | .01        | .04   | .08   |
| 5            | 1      | 5            | 15               | 50          | 6              | 2      | P-UCRS050102       | .01        | .04   | .08   |
| 6            | 0.2    | 6            | 18               | 50          | 6              | 2      | P-UCRS060022       | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |                     |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      |                     |                    |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P371**  
Cutting Condition

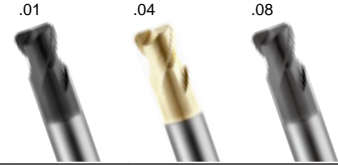
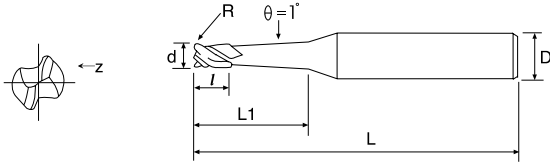
## Pencil Neck Corner Radius Type - 2 flutes

### 2刃斜頸圓鼻立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 0.3    | 6            | 18               | 50          | 6              | 2      | P-UCRS060032       | .01        | .04   | .08   |
| 6            | 0.5    | 6            | 18               | 50          | 6              | 2      | P-UCRS060052       | .01        | .04   | .08   |
| 6            | 1      | 6            | 18               | 50          | 6              | 2      | P-UCRS060102       | .01        | .04   | .08   |
| 6            | 2      | 6            | 18               | 50          | 6              | 2      | P-UCRS060202       | .01        | .04   | .08   |
| 8            | 0.3    | 8            | 20               | 60          | 8              | 2      | P-UCRS080032       | .01        | .04   | .08   |
| 8            | 0.5    | 8            | 20               | 60          | 8              | 2      | P-UCRS080052       | .01        | .04   | .08   |
| 8            | 1      | 8            | 20               | 60          | 8              | 2      | P-UCRS080102       | .01        | .04   | .08   |
| 8            | 2      | 8            | 20               | 60          | 8              | 2      | P-UCRS080202       | .01        | .04   | .08   |
| 10           | 0.5    | 10           | 25               | 75          | 10             | 2      | P-UCRS100052       | .01        | .04   | .08   |
| 10           | 1      | 10           | 25               | 75          | 10             | 2      | P-UCRS100102       | .01        | .04   | .08   |
| 10           | 1.5    | 10           | 25               | 75          | 10             | 2      | P-UCRS100152       | .01        | .04   | .08   |
| 10           | 2      | 10           | 25               | 75          | 10             | 2      | P-UCRS100202       | .01        | .04   | .08   |
| 10           | 3      | 10           | 25               | 75          | 10             | 2      | P-UCRS100302       | .01        | .04   | .08   |
| 12           | 0.5    | 12           | 30               | 75          | 12             | 2      | P-UCRS120052       | .01        | .04   | .08   |
| 12           | 1      | 12           | 30               | 75          | 12             | 2      | P-UCRS120102       | .01        | .04   | .08   |
| 12           | 1.5    | 12           | 30               | 75          | 12             | 2      | P-UCRS120152       | .01        | .04   | .08   |
| 12           | 2      | 12           | 30               | 75          | 12             | 2      | P-UCRS120202       | .01        | .04   | .08   |
| 12           | 3      | 12           | 30               | 75          | 12             | 2      | P-UCRS120302       | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P372**  
Cutting Condition

## Pencil Neck Corner Radius Type- 4 flutes

### 4刃斜頸圓鼻立銑刀

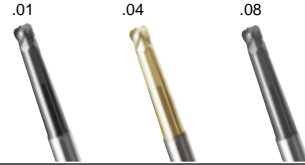
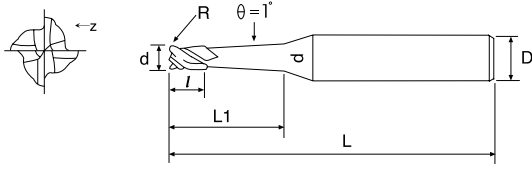
**400 PLUS**

**HRC > 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 2            | 0.2    | 2            | 6                | 50          | 4              | 4      | P-UCRS020024       | .01        | .04   | .08   |
| 2            | 0.3    | 2            | 6                | 50          | 4              | 4      | P-UCRS020034       | .01        | .04   | .08   |
| 2            | 0.5    | 2            | 6                | 50          | 4              | 4      | P-UCRS020054       | .01        | .04   | .08   |
| 3            | 0.2    | 3            | 9                | 50          | 6              | 4      | P-UCRS030024       | .01        | .04   | .08   |
| 3            | 0.3    | 3            | 9                | 50          | 6              | 4      | P-UCRS030034       | .01        | .04   | .08   |
| 3            | 0.5    | 3            | 9                | 50          | 6              | 4      | P-UCRS030054       | .01        | .04   | .08   |
| 3            | 1      | 3            | 9                | 50          | 6              | 4      | P-UCRS030104       | .01        | .04   | .08   |
| 4            | 0.2    | 4            | 12               | 50          | 6              | 4      | P-UCRS040024       | .01        | .04   | .08   |
| 4            | 0.3    | 4            | 12               | 50          | 6              | 4      | P-UCRS040034       | .01        | .04   | .08   |
| 4            | 0.5    | 4            | 12               | 50          | 6              | 4      | P-UCRS040054       | .01        | .04   | .08   |
| 4            | 1      | 4            | 12               | 50          | 6              | 4      | P-UCRS040104       | .01        | .04   | .08   |
| 5            | 0.3    | 5            | 15               | 50          | 6              | 4      | P-UCRS050034       | .01        | .04   | .08   |
| 5            | 0.5    | 5            | 15               | 50          | 6              | 4      | P-UCRS050054       | .01        | .04   | .08   |
| 5            | 1      | 5            | 15               | 50          | 6              | 4      | P-UCRS050104       | .01        | .04   | .08   |
| 6            | 0.2    | 6            | 18               | 50          | 6              | 4      | P-UCRS060024       | .01        | .04   | .08   |
| 6            | 0.3    | 6            | 18               | 50          | 6              | 4      | P-UCRS060034       | .01        | .04   | .08   |
| 6            | 0.5    | 6            | 18               | 50          | 6              | 4      | P-UCRS060054       | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P372**  
Cutting Condition

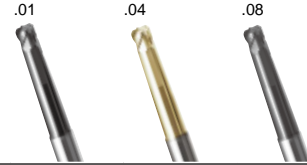
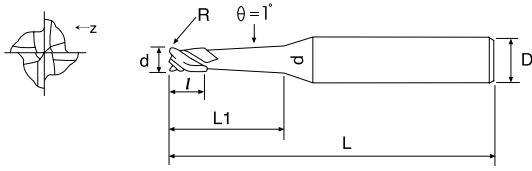
## Pencil Neck Corner Radius Type - 4 flutes

### 4刃斜頸圓鼻立銑刀



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 1      | 6            | 18               | 50          | 6              | 4      | P-UCRS060104       | .01        | .04   | .08   |
| 6            | 2      | 6            | 18               | 50          | 6              | 4      | P-UCRS060204       | .01        | .04   | .08   |
| 8            | 0.3    | 8            | 20               | 60          | 8              | 4      | P-UCRS080034       | .01        | .04   | .08   |
| 8            | 0.5    | 8            | 20               | 60          | 8              | 4      | P-UCRS080054       | .01        | .04   | .08   |
| 8            | 1      | 8            | 20               | 60          | 8              | 4      | P-UCRS080104       | .01        | .04   | .08   |
| 8            | 2      | 8            | 20               | 60          | 8              | 4      | P-UCRS080204       | .01        | .04   | .08   |
| 10           | 0.5    | 10           | 25               | 75          | 10             | 4      | P-UCRS100054       | .01        | .04   | .08   |
| 10           | 1      | 10           | 25               | 75          | 10             | 4      | P-UCRS100104       | .01        | .04   | .08   |
| 10           | 1.5    | 10           | 25               | 75          | 10             | 4      | P-UCRS100154       | .01        | .04   | .08   |
| 10           | 2      | 10           | 25               | 75          | 10             | 4      | P-UCRS100204       | .01        | .04   | .08   |
| 10           | 3      | 10           | 25               | 75          | 10             | 4      | P-UCRS100304       | .01        | .04   | .08   |
| 12           | 0.5    | 12           | 30               | 75          | 12             | 4      | P-UCRS120054       | .01        | .04   | .08   |
| 12           | 1      | 12           | 30               | 75          | 12             | 4      | P-UCRS120104       | .01        | .04   | .08   |
| 12           | 1.5    | 12           | 30               | 75          | 12             | 4      | P-UCRS120154       | .01        | .04   | .08   |
| 12           | 2      | 12           | 30               | 75          | 12             | 4      | P-UCRS120204       | .01        | .04   | .08   |
| 12           | 3      | 12           | 30               | 75          | 12             | 4      | P-UCRS120304       | .01        | .04   | .08   |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P373**  
Cutting Condition

### Corner Radius Type- Long Neck - 4 flutes ■ 4刃長頸圓鼻立銑刀

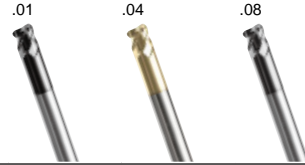
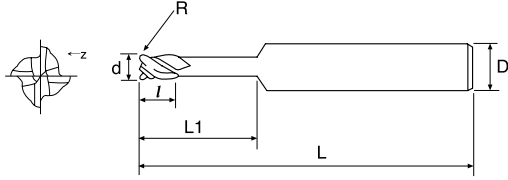
**400 PLUS**

**HRC ▶ 60**



● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 0.3    | 7            | 16               | 75          | 6              | 4      | P-UCR06034         | .01        | .04   | .08   |
| 6            | 0.5    | 7            | 16               | 75          | 6              | 4      | P-UCR06054         | .01        | .04   | .08   |
| 6            | 1      | 7            | 16               | 75          | 6              | 4      | P-UCR06104         | .01        | .04   | .08   |
| 8            | 0.3    | 9            | 20               | 100         | 8              | 4      | P-UCR08034         | .01        | .04   | .08   |
| 8            | 0.5    | 9            | 20               | 100         | 8              | 4      | P-UCR08054         | .01        | .04   | .08   |
| 8            | 1      | 9            | 20               | 100         | 8              | 4      | P-UCR08104         | .01        | .04   | .08   |
| 10           | 0.5    | 10           | 25               | 100         | 10             | 4      | P-UCR10054         | .01        | .04   | .08   |
| 10           | 1      | 10           | 25               | 100         | 10             | 4      | P-UCR10104         | .01        | .04   | .08   |
| 10           | 1.5    | 10           | 25               | 100         | 10             | 4      | P-UCR10154         | .01        | .04   | .08   |
| 10           | 2      | 10           | 25               | 100         | 10             | 4      | P-UCR10204         | .01        | .04   | .08   |
| 12           | 0.5    | 12           | 30               | 100         | 12             | 4      | P-UCR12054         | .01        | .04   | .08   |
| 12           | 1      | 12           | 30               | 100         | 12             | 4      | P-UCR12104         | .01        | .04   | .08   |
| 12           | 1.5    | 12           | 30               | 100         | 12             | 4      | P-UCR12154         | .01        | .04   | .08   |
| 12           | 2      | 12           | 30               | 100         | 12             | 4      | P-UCR12204         | .01        | .04   | .08   |

HRC ▶ 40

HRC ▶ 45

HRC ▶ 50

HRC ▶ 55

**HRC ▶ 60**

HRC ▶ 65

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ○                   | ○                  |                           |                     |                    |

Unit/單位: mm

## 400<sup>+</sup> 切削條件表 P374-379

Cutting Condition

### Square Type - 4 flutes

## ■ 4刃不等立銑刀

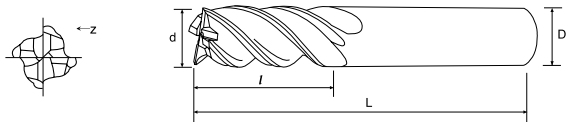
400 PLUS

HRC 55



Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 3            | 7            | 50          | 6              | 4      | PVE0304            | .01        | .04   | .08   |
| 4            | 9            | 50          | 6              | 4      | PVE0404            | .01        | .04   | .08   |
| 5            | 11           | 50          | 6              | 4      | PVE0504            | .01        | .04   | .08   |
| 6            | 13           | 50          | 6              | 4      | PVE0604            | .01        | .04   | .08   |
| 8            | 17           | 60          | 8              | 4      | PVE0804            | .01        | .04   | .08   |
| 10           | 22           | 75          | 10             | 4      | PVE1004            | .01        | .04   | .08   |
| 12           | 26           | 75          | 12             | 4      | PVE1204            | .01        | .04   | .08   |
| 14           | 31           | 100         | 16             | 4      | PVE1404            | .01        | .04   | .08   |
| 16           | 35           | 100         | 16             | 4      | PVE1604            | .01        | .04   | .08   |
| 20           | 40           | 100         | 20             | 4      | PVE2004            | .01        | .04   | .08   |
| 25           | 50           | 120         | 25             | 4      | PVE2504            | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      | ◎      | ◎                   | ★                  | ○                         | ○                   |                    |

Unit/單位: mm



**400<sup>+</sup>** 切削條件表 **P374-379**  
Cutting Condition

Square Type - Short / Medium / Long Flute

## ■ 4刃不等立銑刀 - 1倍 / 1.5倍 / 3倍長刃

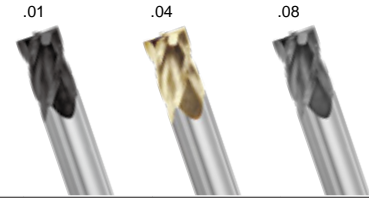
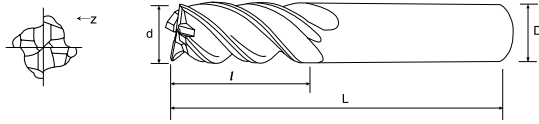
**400 PLUS**

**HRC > 55**



Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



### Short Flute (1D) - 1 倍長刃

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 6            | 50          | 6              | 4      | PVES0604           | .01        | .04   | .08   |
| 8            | 8            | 60          | 8              | 4      | PVES0804           | .01        | .04   | .08   |
| 10           | 10           | 75          | 10             | 4      | PVES1004           | .01        | .04   | .08   |
| 12           | 12           | 75          | 12             | 4      | PVES1204           | .01        | .04   | .08   |
| 16           | 16           | 100         | 16             | 4      | PVES1604           | .01        | .04   | .08   |
| 20           | 20           | 100         | 20             | 4      | PVES2004           | .01        | .04   | .08   |

### Medium Flute (1.5D) - 1.5 倍長刃

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 9            | 50          | 6              | 4      | PVEM0604           | .01        | .04   | .08   |
| 8            | 12           | 60          | 8              | 4      | PVEM0804           | .01        | .04   | .08   |
| 10           | 15           | 75          | 10             | 4      | PVEM1004           | .01        | .04   | .08   |
| 12           | 18           | 75          | 12             | 4      | PVEM1204           | .01        | .04   | .08   |
| 16           | 24           | 100         | 16             | 4      | PVEM1604           | .01        | .04   | .08   |
| 20           | 30           | 100         | 20             | 4      | PVEM2004           | .01        | .04   | .08   |

### Long Flute (3D) - 3 倍長刃

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 20           | 75          | 6              | 4      | PVEL0604           | .01        | .04   | .08   |
| 8            | 25           | 75          | 8              | 4      | PVEL0804           | .01        | .04   | .08   |
| 10           | 30           | 100         | 10             | 4      | PVEL1004           | .01        | .04   | .08   |
| 12           | 35           | 100         | 12             | 4      | PVEL1204           | .01        | .04   | .08   |
| 16           | 45           | 120         | 16             | 4      | PVEL1604           | .01        | .04   | .08   |
| 20           | 50           | 120         | 20             | 4      | PVEL2004           | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      |        | ○ |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        |   | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      |        | ◎ | ◎                   | ★                  | ○                         | ○                   |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 P374-379  
Cutting Condition

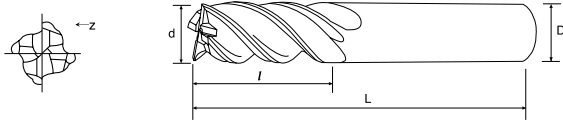
## Square Type - Heavy Duty

### ■ 4刃不等立銑刀 高速重切



Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTIBN     | ZrN-S | nACRo |
| 6            | 13           | 50          | 6              | 4      | PVEC0604           | .01        | .04   | .08   |
| 8            | 17           | 60          | 8              | 4      | PVEC0804           | .01        | .04   | .08   |
| 10           | 22           | 75          | 10             | 4      | PVEC1004           | .01        | .04   | .08   |
| 12           | 26           | 75          | 12             | 4      | PVEC1204           | .01        | .04   | .08   |
| 16           | 35           | 100         | 16             | 4      | PVEC1604           | .01        | .04   | .08   |
| 20           | 40           | 100         | 20             | 4      | PVEC2004           | .01        | .04   | .08   |

Patent of Japan No: Nr.3145277  
本產品已獲日本專利 字號: Nr.3145277

Patent of Germany No: Nr.20 2007 008 896.5  
本產品已獲德國專利 字號: Nr.20 2007 008 896.5



Patent of China No: ZL 2007 2 0154039.4  
獲中國專利 字號: ZL 2007 2 0154039.4

Patent of Italy No: N. 0000268164  
獲義大利專利 字號: N. 0000268164

Patent of Taiwan No: M 328331  
獲台灣專利 字號: 新型第 M 328331



Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |   | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|---|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |   |                     |                    |                           |                     |                    |
| ALTIBN     | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ○ |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                      | ◎                  | ○      | ○      |        |   | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                      | ◎                  | ◎      | ○      |        | ◎ | ◎                   | ★                  | ○                         | ○                   |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 **P374-379**  
Cutting Condition

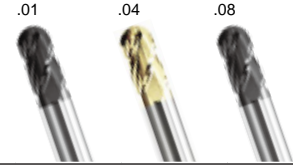
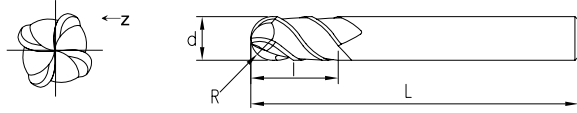
## Ball Nose Type - 4 flutes

### ■ 4刃不等球型立銑刀

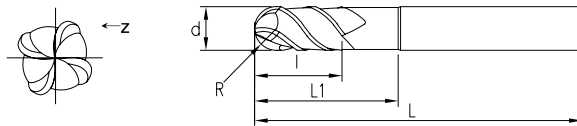


Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | 刀長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 3      | 6            | 50          | 6              | 4      | PVB0604            | .01        | .04   | .08   |
| 8            | 4      | 8            | 60          | 8              | 4      | PVB0804            | .01        | .04   | .08   |
| 10           | 5      | 10           | 75          | 10             | 4      | PVB1004            | .01        | .04   | .08   |
| 12           | 6      | 12           | 75          | 12             | 4      | PVB1204            | .01        | .04   | .08   |
| 16           | 8      | 16           | 100         | 16             | 4      | PVB1604            | .01        | .04   | .08   |



### Long Flute & Neck - 長刃 & 有效

| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nACRo |
| 6            | 3      | 9            | 15               | 60          | 6              | 4      | PVBSX0604          | .01        | .04   | .08   |
| 8            | 4      | 12           | 20               | 75          | 8              | 4      | PVBSX0804          | .01        | .04   | .08   |
| 10           | 5      | 15           | 25               | 80          | 10             | 4      | PVBSX1004          | .01        | .04   | .08   |
| 12           | 6      | 18           | 30               | 100         | 12             | 4      | PVBSX1204          | .01        | .04   | .08   |
| 16           | 8      | 24           | 40               | 120         | 16             | 4      | PVBSX1604          | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ○      | ○                   |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nACRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ◎      | ◎                   | ★                  | ○                         | ○                   |                    |

Unit/單位: mm

**400<sup>+</sup>** 切削條件表 P374-379  
Cutting Condition

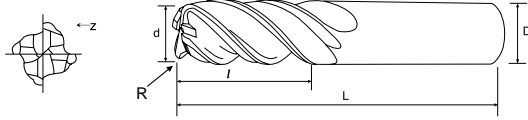
Corner Radius Type - 4 flutes

## ■ 4刃不等圓鼻立銑刀



Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| Dimension 規格 |               |              |             |                |        | Purchase Code 採購代碼 |            |       |       |
|--------------|---------------|--------------|-------------|----------------|--------|--------------------|------------|-------|-------|
| Diameter     | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |       |       |
| d 刃徑         | R 角           | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | ALTiBN     | ZrN-S | nAcRo |
| 3            | 0.1           | 7            | 50          | 6              | 4      | PVR0300104         | .01        | .04   | .08   |
| 3            | 0.3           | 7            | 50          | 6              | 4      | PVR0300304         | .01        | .04   | .08   |
| 3            | 0.5           | 7            | 50          | 6              | 4      | PVR0300504         | .01        | .04   | .08   |
| 4            | 0.1           | 9            | 50          | 6              | 4      | PVR0400104         | .01        | .04   | .08   |
| 4            | 0.3           | 9            | 50          | 6              | 4      | PVR0400304         | .01        | .04   | .08   |
| 4            | 0.5           | 9            | 50          | 6              | 4      | PVR0400504         | .01        | .04   | .08   |
| 4            | 1             | 9            | 50          | 6              | 4      | PVR0401004         | .01        | .04   | .08   |
| 5            | 0.5           | 11           | 50          | 6              | 4      | PVR0500504         | .01        | .04   | .08   |
| 6            | 0.1           | 13           | 50          | 6              | 4      | PVR0600104         | .01        | .04   | .08   |
| 6            | 0.3           | 13           | 50          | 6              | 4      | PVR0600304         | .01        | .04   | .08   |
| 6            | 0.5           | 13           | 50          | 6              | 4      | PVR0600504         | .01        | .04   | .08   |
| 6            | 1             | 13           | 50          | 6              | 4      | PVR0601004         | .01        | .04   | .08   |
| 8            | 0.1           | 17           | 60          | 8              | 4      | PVR0800104         | .01        | .04   | .08   |
| 8            | 0.5           | 17           | 60          | 8              | 4      | PVR0800504         | .01        | .04   | .08   |
| 8            | 1             | 17           | 60          | 8              | 4      | PVR0801004         | .01        | .04   | .08   |
| 8            | 2             | 17           | 60          | 8              | 4      | PVR0802004         | .01        | .04   | .08   |
| 10           | 0.1           | 22           | 75          | 10             | 4      | PVR1000104         | .01        | .04   | .08   |
| 10           | 0.5           | 22           | 75          | 10             | 4      | PVR1000504         | .01        | .04   | .08   |
| 10           | 1             | 22           | 75          | 10             | 4      | PVR1001004         | .01        | .04   | .08   |
| 10           | 2             | 22           | 75          | 10             | 4      | PVR1002004         | .01        | .04   | .08   |
| 12           | 0.1           | 26           | 75          | 12             | 4      | PVR1200104         | .01        | .04   | .08   |
| 12           | 0.5           | 26           | 75          | 12             | 4      | PVR1200504         | .01        | .04   | .08   |
| 12           | 1             | 26           | 75          | 12             | 4      | PVR1201004         | .01        | .04   | .08   |
| 12           | 2             | 26           | 75          | 12             | 4      | PVR1202004         | .01        | .04   | .08   |
| 16           | 0.5           | 35           | 100         | 16             | 4      | PVR1600504         | .01        | .04   | .08   |
| 16           | 1             | 35           | 100         | 16             | 4      | PVR1601004         | .01        | .04   | .08   |
| 16           | 2             | 35           | 100         | 16             | 4      | PVR1602004         | .01        | .04   | .08   |
| 16           | 3             | 35           | 100         | 16             | 4      | PVR1603004         | .01        | .04   | .08   |
| 20           | 1             | 40           | 100         | 20             | 4      | PVR2001004         | .01        | .04   | .08   |
| 20           | 1.5           | 40           | 100         | 20             | 4      | PVR2001504         | .01        | .04   | .08   |
| 20           | 2             | 40           | 100         | 20             | 4      | PVR2002004         | .01        | .04   | .08   |
| 20           | 2.5           | 40           | 100         | 20             | 4      | PVR2002504         | .01        | .04   | .08   |
| 20           | 3             | 40           | 100         | 20             | 4      | PVR2003004         | .01        | .04   | .08   |
| 25           | 1             | 50           | 120         | 25             | 4      | PVR2501004         | .01        | .04   | .08   |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| ALTiBN     | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ○      |                     |                    |                           |                     |                    |
| ZrN-S      | ◎                                  | ◎                    | ◎                  | ○      | ○      |        | ○                   |                    |                           |                     |                    |
| nAcRo      | ◎                                  | ◎                    | ◎                  | ◎      | ○      | ◎      | ◎                   | ★                  | ○                         | ○                   |                    |

Unit/單位: mm



# 200 PLUS

SERIES

**High Performance for High Hardness Exotic Materials**

難切削材高效刀具系列 - 不等分割、不等導程刀型設計

擁有 持續 掌握

## High Performance for High Hardness Exotic Materials 高效高硬度難切削型銑刀

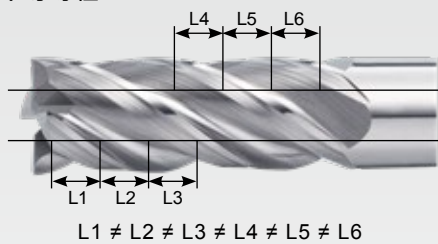
We are different 我們不一樣

### Characteristics 特點

Unequal flute spacing  
 不等分割



Unequal leads  
 不等導程



### Excellent Anti-vibration effect 振動抑制效果

- Unequal flute spacing and unequal lead design have excellent and long effect of anti-vibration during milling. 通過不等分割、不等距導程形狀抑制加工時的顫振，表現出眾的耐久性。
- Super Ultra Fine Micro Grain Carbide raw material with the most suitable flute geometry ensure to improve chip disposal and rigidity. 採用高硬度材料，溝槽特殊設計，提升刀具排屑力與剛性。

### Long tool life 增長刀具壽命

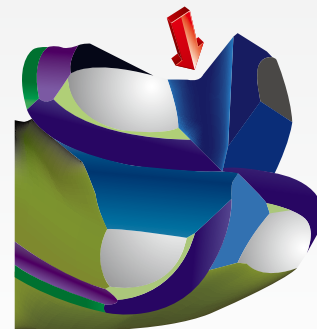
- With Super Ultra Fine Micro Grain Carbide raw material which has high temperature resistance and with P-nACo coating that can extend tool life. 採用高耐熱的超硬材質與P-nACo塗層，延長刀具壽命。
- It's much easier to have finishing procedure on Hardened steel compare to general endmills. 一般銑刀在精加工淬硬鋼材質時難度相當高，本產品可解決此問題使加工順暢輕鬆。

### 200PLUS Ball nose & Corner radius type - surface and angle 200PLUS 球刀&圓鼻刀-表面及角度



Specular surface 鏡面研磨

R angle: 0~90° Negative angle design  
 R 部 0~90° 不等切削角負角設計



### 200PLUS square type - surface 200PLUS 平刀-表面



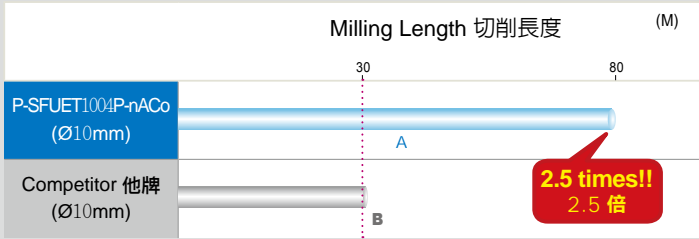
OD specular surface OD 全鏡面研磨

Cutting edge specular surface 切削角鏡面研磨



Patent of Taiwan No: I 280288  
 (the method of tool surface hardening)  
 本產品已獲台灣一種刀具表面硬化方法之專利證書字號: I 280288

Unit/單位: mm



| P-SFUET1004P-nACo Tool Life 壽命 |                                    |   |           |           |          |          |
|--------------------------------|------------------------------------|---|-----------|-----------|----------|----------|
| Before Cutting 測試前             |                                    |   |           |           |          |          |
| Parameter 綜合參數                 | Cutting Condition 使用參數 :           | Fz:0.04 mm/ 刃 Vc:100 m/min<br>AP:15 mm AE:0.1 mm<br>S:3183 min F:510 mm/min |           |           |          |          |
|                                | Machine 使用 CNC 機台 :                | MAKINO V33  |           |           |          |          |
|                                | Cooling Way 冷卻方式 :                 | Air 空冷  |           |           |          |          |
|                                | Work Material 切削素材 :               | SKD11 熱處理冷模鋼 (HRC58)  |           |           |          |          |
|                                | Tool 測試刀款 :                        | SFUPVE1004-FIN-nACo   |           |           |          |          |
|                                | Holder 使用刀桿 :                      | GD HSK-F63-EZ10-090<br>Shrink Fit Holder 燒結式刀桿                              |           |           |          |          |
|                                | The Length of Tool Extend 刀具伸出長度 : | 37mm  |           |           |          |          |
|                                | Runout of Tool 刀具偏擺 :              | 0.002mm   |           |           |          |          |
| Tool's Cutting Part 刀具刃處       | Cutting Edge 前端 (1)                | Cutting Edge 前端 (2)   | 7.5mm (1) | 7.5mm (2) | 15mm (1) | 15mm (2) |
|                                | Total Cutting Length 切削總長度         |   |           |           |          |          |
|                                | 0.2 m 米                            |   |           |           |          |          |
|                                | 3m 米                               |   |           |           |          |          |
|                                | 30m 米                              |   |           |           |          |          |
|                                | 60m 米                              |   |           |           |          |          |
| Before & After Cutting 測試前後    |                                    |   |           |           |          |          |
| Work Surface 工件表面 (0.2m 米)     |                                    |   |           |           |          |          |
| Work Surface 工件表面 (60m 米)      |                                    |   |           |           |          |          |

| Competitor Tool Life 它牌壽命   |                                    |   |           |           |          |          |
|-----------------------------|------------------------------------|---|-----------|-----------|----------|----------|
| Before Cutting 測試前          |                                    |   |           |           |          |          |
| Parameter 綜合參數              | Cutting Condition 使用參數 :           | Fz:0.04 mm/ 刃 Vc:100 m/min<br>AP:15 mm AE:0.1 mm<br>S:3183 min F:510 mm/min |           |           |          |          |
|                             | Machine 使用 CNC 機台 :                | MAKINO V33  |           |           |          |          |
|                             | Cooling Way 冷卻方式 :                 | Air 空冷  |           |           |          |          |
|                             | Work Material 切削素材 :               | SKD11 熱處理冷模鋼 (HRC58)  |           |           |          |          |
|                             | Tool 測試刀款 :                        | Competitor 它牌   |           |           |          |          |
|                             | Holder 使用刀桿 :                      | GD HSK-F63-EZ10-090<br>Shrink Fit Holder 燒結式刀桿                              |           |           |          |          |
|                             | The Length of Tool Extend 刀具伸出長度 : | 37mm  |           |           |          |          |
|                             | Runout of Tool 刀具偏擺 :              | 0.002mm   |           |           |          |          |
| Tool's Cutting Part 刀具刃處    | Cutting Edge 前端 (1)                | Cutting Edge 前端 (2)   | 7.5mm (1) | 7.5mm (2) | 15mm (1) | 15mm (2) |
|                             | Total Cutting Length 切削總長度         |   |           |           |          |          |
|                             | 0.2 m 米                            |   |           |           |          |          |
|                             | 3m 米                               |   |           |           |          |          |
|                             | 30m 米                              |   |           |           |          |          |
|                             | 60m 米                              |   |           |           |          |          |
| Before & After Cutting 測試前後 |                                    |   |           |           |          |          |
| Work Surface 工件表面 (0.2m 米)  |                                    |   |           |           |          |          |
| Work Surface 工件表面 (30m 米)   |                                    |   |           |           |          |          |

| P-SFUBT1004 Uncoated 無鍍膜 |   |                                    |                          |
|--------------------------|---|------------------------------------|--------------------------|
| Parameter 綜合參數           |   |                                    |                          |
| Cutting Condition 使用參數 : | Fz:0.08 mm/ 刃 Vc:80 m/min<br>AP:0.2 mm AE:0.2 mm<br>S:2546 min F:814 mm/min | The Length of Tool Extend 刀具伸出長度 : | 33mm                     |
| Work Material 切削素材 :     | SKD11 熱處理冷模鋼 (HRC58) (100mm*15mm)   | Cooling Way 冷卻方式 :                 | Air 空冷                   |
| Tool 測試刀款 :              | P-SFUBT1004 Uncoated 無鍍膜  | Cutting Time 加工時間 :                | 18 min                   |
| Holder 使用刀桿 :            | GD HSK-F63-EZ10-090<br>Shrink Fit Holder 燒結式刀桿                              | Runout of Tool 刀具偏擺 :              | 0.001mm                  |
| Machine 使用 CNC 機台 :      | MAKINO V33  | Load of Spindle 主軸負載 :             | 5%                       |
| Before Cutting 測試前       |   | The cutting edge broke 刀具磨損        |                          |
|                          |   | Before Cutting 測試前                 | After Cutting 測試後        |
|                          |   |                                    |                          |
| Work Surface 工件表面        |   | Surface Roughness(Ra) 粗糙度          |                          |
|                          |   | Side up and down 側面上下              | Side left and right 側面左右 |
|                          |   |                                    |                          |

## 200<sup>+</sup> 切削條件表 P380

Cutting Condition

### Miniature Square Type - 2 flutes

## 2刃微小徑立銑刀

200 PLUS

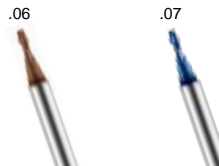
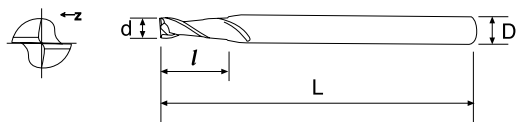
HRC 60

A B A#B

L3 L4 L1#L3#L4#L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



HRC >40

HRC >45

HRC >50

HRC >55

HRC >60

HRC >65

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACO |
| 0.2          | 0.4          | 38          | 3              | 2      | P-SFUMIE0023       | .06        | .07    |
| 0.3          | 0.6          | 38          | 3              | 2      | P-SFUMIE0033       | .06        | .07    |
| 0.4          | 0.8          | 38          | 3              | 2      | P-SFUMIE0043       | .06        | .07    |
| 0.5          | 1            | 38          | 3              | 2      | P-SFUMIE0053       | .06        | .07    |
| 0.6          | 1.2          | 38          | 3              | 2      | P-SFUMIE0063       | .06        | .07    |
| 0.7          | 1.4          | 38          | 3              | 2      | P-SFUMIE0073       | .06        | .07    |
| 0.8          | 1.6          | 38          | 3              | 2      | P-SFUMIE0083       | .06        | .07    |
| 0.9          | 1.8          | 38          | 3              | 2      | P-SFUMIE0093       | .06        | .07    |
| 1            | 2            | 38          | 3              | 2      | P-SFUMIE0103       | .06        | .07    |
| 1.1          | 2            | 38          | 3              | 2      | P-SFUMIE0113       | .06        | .07    |
| 1.2          | 2.5          | 38          | 3              | 2      | P-SFUMIE0123       | .06        | .07    |
| 1.3          | 2.5          | 38          | 3              | 2      | P-SFUMIE0133       | .06        | .07    |
| 1.4          | 3            | 38          | 3              | 2      | P-SFUMIE0143       | .06        | .07    |
| 1.5          | 3            | 38          | 3              | 2      | P-SFUMIE0153       | .06        | .07    |
| 1.6          | 3.5          | 38          | 3              | 2      | P-SFUMIE0163       | .06        | .07    |
| 1.7          | 3.5          | 38          | 3              | 2      | P-SFUMIE0173       | .06        | .07    |
| 1.8          | 4            | 38          | 3              | 2      | P-SFUMIE0183       | .06        | .07    |
| 1.9          | 4            | 38          | 3              | 2      | P-SFUMIE0193       | .06        | .07    |
| 2            | 4            | 38          | 3              | 2      | P-SFUMIE0203       | .06        | .07    |
| 2.1          | 4            | 38          | 3              | 2      | P-SFUMIE0213       | .06        | .07    |
| 2.2          | 4.5          | 38          | 3              | 2      | P-SFUMIE0223       | .06        | .07    |
| 2.3          | 4.5          | 38          | 3              | 2      | P-SFUMIE0233       | .06        | .07    |
| 2.4          | 5            | 38          | 3              | 2      | P-SFUMIE0243       | .06        | .07    |
| 2.5          | 5            | 38          | 3              | 2      | P-SFUMIE0253       | .06        | .07    |
| 2.6          | 5            | 38          | 3              | 2      | P-SFUMIE0263       | .06        | .07    |
| 2.7          | 5.5          | 38          | 3              | 2      | P-SFUMIE0273       | .06        | .07    |
| 2.8          | 5.5          | 38          | 3              | 2      | P-SFUMIE0283       | .06        | .07    |
| 2.9          | 6            | 38          | 3              | 2      | P-SFUMIE0293       | .06        | .07    |
| 3            | 6            | 38          | 3              | 2      | P-SFUMIE0303       | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm



# 200<sup>+</sup>

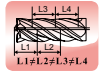
切削條件表 **P380**  
Cutting Condition

## Miniature Square Type - 2 flutes

### ■ 2刃微小徑立銑刀

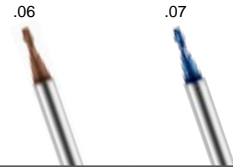
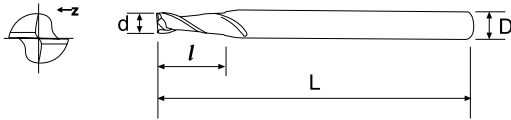
**200 PLUS**

**HRC 60**



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nAco |
| 0.2          | 0.4          | 50          | 4              | 2      | P-SFUMIE0024       | .06        | .07    |
| 0.3          | 0.6          | 50          | 4              | 2      | P-SFUMIE0034       | .06        | .07    |
| 0.4          | 0.8          | 50          | 4              | 2      | P-SFUMIE0044       | .06        | .07    |
| 0.5          | 1            | 50          | 4              | 2      | P-SFUMIE0054       | .06        | .07    |
| 0.6          | 1.2          | 50          | 4              | 2      | P-SFUMIE0064       | .06        | .07    |
| 0.7          | 1.4          | 50          | 4              | 2      | P-SFUMIE0074       | .06        | .07    |
| 0.8          | 1.6          | 50          | 4              | 2      | P-SFUMIE0084       | .06        | .07    |
| 0.9          | 1.8          | 50          | 4              | 2      | P-SFUMIE0094       | .06        | .07    |
| 1            | 2            | 50          | 4              | 2      | P-SFUMIE0104       | .06        | .07    |
| 1.1          | 2            | 50          | 4              | 2      | P-SFUMIE0114       | .06        | .07    |
| 1.2          | 2.5          | 50          | 4              | 2      | P-SFUMIE0124       | .06        | .07    |
| 1.3          | 2.5          | 50          | 4              | 2      | P-SFUMIE0134       | .06        | .07    |
| 1.4          | 3            | 50          | 4              | 2      | P-SFUMIE0144       | .06        | .07    |
| 1.5          | 3            | 50          | 4              | 2      | P-SFUMIE0154       | .06        | .07    |
| 1.6          | 3.5          | 50          | 4              | 2      | P-SFUMIE0164       | .06        | .07    |
| 1.7          | 3.5          | 50          | 4              | 2      | P-SFUMIE0174       | .06        | .07    |
| 1.8          | 4            | 50          | 4              | 2      | P-SFUMIE0184       | .06        | .07    |
| 1.9          | 4            | 50          | 4              | 2      | P-SFUMIE0194       | .06        | .07    |
| 2            | 4            | 50          | 4              | 2      | P-SFUMIE0204       | .06        | .07    |
| 2.1          | 4            | 50          | 4              | 2      | P-SFUMIE0214       | .06        | .07    |
| 2.2          | 4.5          | 50          | 4              | 2      | P-SFUMIE0224       | .06        | .07    |
| 2.3          | 4.5          | 50          | 4              | 2      | P-SFUMIE0234       | .06        | .07    |
| 2.4          | 5            | 50          | 4              | 2      | P-SFUMIE0244       | .06        | .07    |
| 2.5          | 5            | 50          | 4              | 2      | P-SFUMIE0254       | .06        | .07    |
| 2.6          | 5            | 50          | 4              | 2      | P-SFUMIE0264       | .06        | .07    |
| 2.7          | 5.5          | 50          | 4              | 2      | P-SFUMIE0274       | .06        | .07    |
| 2.8          | 5.5          | 50          | 4              | 2      | P-SFUMIE0284       | .06        | .07    |
| 2.9          | 6            | 50          | 4              | 2      | P-SFUMIE0294       | .06        | .07    |
| 3            | 6            | 50          | 4              | 2      | P-SFUMIE0304       | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

## 200<sup>+</sup> 切削條件表 P381

Cutting Condition

### Square Type - 2 flutes

## ■ 2刃立銑刀

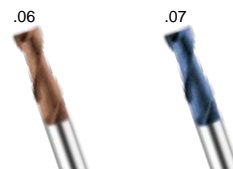
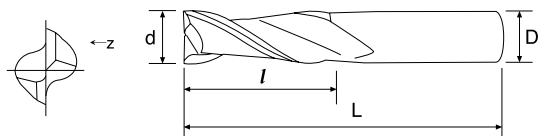
200 Nano

HRC 65



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



HRC >40

HRC >45

HRC >50

HRC >55

HRC >60

HRC >65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nAco |
| 1            | 2.5          | 50          | 4              | 2      | P-SFUET0102        | .06        | .07    |
| 1.5          | 3            | 50          | 4              | 2      | P-SFUET0152        | .06        | .07    |
| 2            | 5            | 50          | 4              | 2      | P-SFUET0202        | .06        | .07    |
| 2.5          | 6            | 50          | 4              | 2      | P-SFUET0252        | .06        | .07    |
| 3            | 7.5          | 50          | 4              | 2      | P-SFUET0302        | .06        | .07    |
| 3.5          | 8            | 50          | 4              | 2      | P-SFUET0352        | .06        | .07    |
| 4            | 9            | 50          | 4              | 2      | P-SFUET0402        | .06        | .07    |
| 4.5          | 10           | 50          | 6              | 2      | P-SFUET0452        | .06        | .07    |
| 5            | 11           | 50          | 6              | 2      | P-SFUET0502        | .06        | .07    |
| 5.5          | 12           | 50          | 6              | 2      | P-SFUET0552        | .06        | .07    |
| 6            | 13           | 60          | 6              | 2      | P-SFUET0602        | .06        | .07    |
| 6.5          | 14           | 60          | 8              | 2      | P-SFUET0652        | .06        | .07    |
| 7            | 14           | 60          | 8              | 2      | P-SFUET0702        | .06        | .07    |
| 7.5          | 16           | 60          | 8              | 2      | P-SFUET0752        | .06        | .07    |
| 8            | 16           | 60          | 8              | 2      | P-SFUET0802        | .06        | .07    |
| 8.5          | 18           | 75          | 10             | 2      | P-SFUET0852        | .06        | .07    |
| 9            | 18           | 75          | 10             | 2      | P-SFUET0902        | .06        | .07    |
| 9.5          | 22           | 75          | 10             | 2      | P-SFUET0952        | .06        | .07    |
| 10           | 22           | 75          | 10             | 2      | P-SFUET1002        | .06        | .07    |
| 10.5         | 24           | 75          | 12             | 2      | P-SFUET1052        | .06        | .07    |
| 11           | 24           | 75          | 12             | 2      | P-SFUET1102        | .06        | .07    |
| 11.5         | 24           | 75          | 12             | 2      | P-SFUET1152        | .06        | .07    |
| 12           | 26           | 75          | 12             | 2      | P-SFUET1202        | .06        | .07    |
| 14           | 30           | 75          | 16             | 2      | P-SFUET1402        | .06        | .07    |
| 15           | 30           | 75          | 16             | 2      | P-SFUET1502        | .06        | .07    |
| 16           | 33           | 75          | 16             | 2      | P-SFUET1602        | .06        | .07    |
| 20           | 45           | 100         | 20             | 2      | P-SFUET2002        | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

## 200<sup>+</sup> 切削條件表 P381

Cutting Condition

### Square Type - 4 flutes

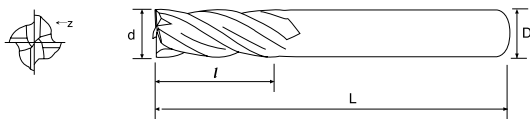
## ■ 4 刃立銑刀

200 PLUS

HRC 65

A D  
B C  
A#B#C#D

L3 L4  
L1 L2  
L1#L3#L4



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nAco |
| 1            | 2.5          | 50          | 4              | 4      | P-SFUET0104        | .06        | .07    |
| 1.5          | 3            | 50          | 4              | 4      | P-SFUET0154        | .06        | .07    |
| 2            | 5            | 50          | 4              | 4      | P-SFUET0204        | .06        | .07    |
| 2.5          | 6            | 50          | 4              | 4      | P-SFUET0254        | .06        | .07    |
| 3            | 7            | 50          | 4              | 4      | P-SFUET0304        | .06        | .07    |
| 3.5          | 8            | 50          | 4              | 4      | P-SFUET0304        | .06        | .07    |
| 4            | 10           | 50          | 4              | 4      | P-SFUET0404(4D)    | .06        | .07    |
| 4            | 9            | 50          | 6              | 4      | P-SFUET0404        | .06        | .07    |
| 4.5          | 10           | 50          | 6              | 4      | P-SFUET0454        | .06        | .07    |
| 5            | 11           | 50          | 6              | 4      | P-SFUET0504        | .06        | .07    |
| 5.5          | 12.5         | 60          | 6              | 4      | P-SFUET0554        | .06        | .07    |
| 6            | 13           | 50          | 6              | 4      | P-SFUET0604        | .06        | .07    |
| 7            | 20           | 60          | 8              | 4      | P-SFUET0704        | .06        | .07    |
| 8            | 19           | 60          | 8              | 4      | P-SFUET0804        | .06        | .07    |
| 10           | 22           | 75          | 10             | 4      | P-SFUET1004        | .06        | .07    |
| 12           | 26           | 75          | 12             | 4      | P-SFUET1204        | .06        | .07    |
| 14           | 30           | 80          | 16             | 4      | P-SFUET1404        | .06        | .07    |
| 16           | 35           | 100         | 16             | 4      | P-SFUET1604        | .06        | .07    |
| 20           | 44           | 100         | 20             | 4      | P-SFUET2004        | .06        | .07    |
| 25           | 55           | 100         | 25             | 4      | P-SFUET2504        | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

## 200<sup>+</sup> 切削條件表 P383

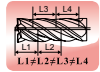
Cutting Condition

### Square Type - Long Flute - 2 flutes

## 2刃長刃立銑刀

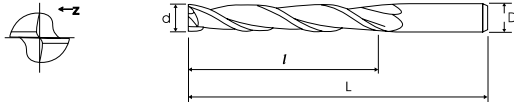
200 PLUS

HRC 65



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 1            | 4            | 50          | 4              | 2      | P-SFULET0102       | .06        | .07    |
| 1.5          | 6            | 50          | 4              | 2      | P-SFULET0152       | .06        | .07    |
| 2            | 8            | 50          | 4              | 2      | P-SFULET0202       | .06        | .07    |
| 3            | 11           | 60          | 6              | 2      | P-SFULET0302       | .06        | .07    |
| 4            | 14           | 60          | 6              | 2      | P-SFULET0402       | .06        | .07    |
| 4.5          | 16           | 60          | 6              | 2      | P-SFULET0452       | .06        | .07    |
| 5            | 18           | 60          | 6              | 2      | P-SFULET0502       | .06        | .07    |
| 5.5          | 20           | 60          | 6              | 2      | P-SFULET0552       | .06        | .07    |
| 6            | 25           | 75          | 6              | 2      | P-SFULET0602       | .06        | .07    |
| 6.5          | 25           | 75          | 8              | 2      | P-SFULET0652       | .06        | .07    |
| 7            | 25           | 75          | 8              | 2      | P-SFULET0702       | .06        | .07    |
| 7.5          | 25           | 75          | 8              | 2      | P-SFULET0752       | .06        | .07    |
| 8            | 25           | 75          | 8              | 2      | P-SFULET0802       | .06        | .07    |
| 8            | 35           | 100         | 8              | 2      | P-SFULET0812       | .06        | .07    |
| 8.5          | 35           | 100         | 10             | 2      | P-SFULET0852       | .06        | .07    |
| 9            | 35           | 100         | 10             | 2      | P-SFULET0902       | .06        | .07    |
| 9.5          | 40           | 100         | 10             | 2      | P-SFULET0952       | .06        | .07    |
| 10           | 40           | 100         | 10             | 2      | P-SFULET1002       | .06        | .07    |
| 10.5         | 40           | 100         | 12             | 2      | P-SFULET1052       | .06        | .07    |
| 11           | 40           | 100         | 12             | 2      | P-SFULET1102       | .06        | .07    |
| 11.5         | 45           | 100         | 12             | 2      | P-SFULET1152       | .06        | .07    |
| 12           | 45           | 100         | 12             | 2      | P-SFULET1202       | .06        | .07    |
| 14           | 45           | 100         | 16             | 2      | P-SFULET1402       | .06        | .07    |
| 15           | 45           | 100         | 16             | 2      | P-SFULET1502       | .06        | .07    |
| 16           | 45           | 100         | 16             | 2      | P-SFULET1602       | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P384**  
Cutting Condition

## Square Type - Long Flute - 4 flute

### ■ 4刃長刃立銑刀

**200 PLUS**

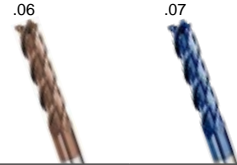
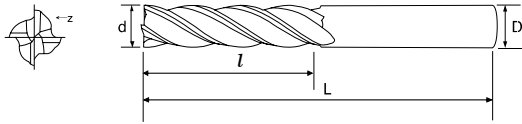
**HRC 65**

A D  
B C  
A#B#C#D

L3 L4  
L1#L2#L3#L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 1            | 4            | 50          | 4              | 4      | P-SFULET0104       | .06        | .07    |
| 1.5          | 6            | 50          | 4              | 4      | P-SFULET0154       | .06        | .07    |
| 2            | 8            | 50          | 4              | 4      | P-SFULET0204       | .06        | .07    |
| 3            | 12           | 60          | 6              | 4      | P-SFULET0304       | .06        | .07    |
| 4            | 16           | 60          | 6              | 4      | P-SFULET0404       | .06        | .07    |
| 5            | 20           | 75          | 6              | 4      | P-SFULET0504       | .06        | .07    |
| 6            | 25           | 75          | 6              | 4      | P-SFULET0604       | .06        | .07    |
| 7            | 30           | 75          | 8              | 4      | P-SFULET0704       | .06        | .07    |
| 8            | 30           | 75          | 8              | 4      | P-SFULET0804       | .06        | .07    |
| 10           | 40           | 100         | 10             | 4      | P-SFULET1004       | .06        | .07    |
| 12           | 45           | 100         | 12             | 4      | P-SFULET1204       | .06        | .07    |
| 14           | 45           | 100         | 16             | 4      | P-SFULET1404       | .06        | .07    |
| 16           | 65           | 150         | 16             | 4      | P-SFULET1604       | .06        | .07    |
| 20           | 75           | 150         | 20             | 4      | P-SFULET2004       | .06        | .07    |
| 25           | 80           | 150         | 25             | 4      | P-SFULET2504       | .06        | .07    |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

**HRC > 65**

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

## 200<sup>+</sup> 切削條件表 P385

Cutting Condition

### Square Type - For Hard Material - Multiple Flutes

## 多刃高硬度用立銑刀

200 PLUS

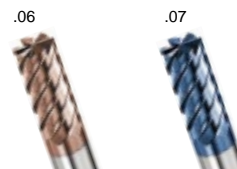
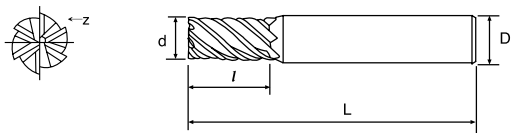
HRC 65

A D B C A#B#C#D

L3 L4 L1#L2#L3#L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



HRC >40

HRC >45

HRC >50

HRC >55

HRC >60

HRC >65



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 6            | 15           | 60          | 6              | 6      | P-SFUVT0606        | .06        | .07    |
| 8            | 20           | 60          | 8              | 6      | P-SFUVT0806        | .06        | .07    |
| 10           | 25           | 75          | 10             | 6      | P-SFUVT1006        | .06        | .07    |
| 12           | 30           | 75          | 12             | 6      | P-SFUVT1206        | .06        | .07    |
| 16           | 45           | 100         | 16             | 6      | P-SFUVT1606        | .06        | .07    |
| 20           | 45           | 100         | 20             | 8      | P-SFUVT2008        | .06        | .07    |
| 25           | 45           | 100         | 25             | 8      | P-SFUVT2508        | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P385**  
Cutting Condition

## Square Type - Long Flute - Multiple Flutes

### ■ 多刃長刃強力立銑刀

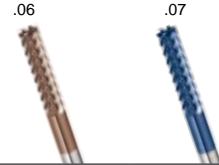
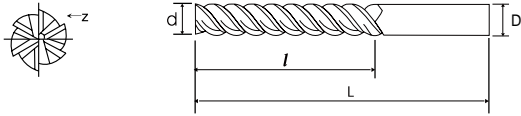
**200 PLUS**

**HRC 65**



- Super Ultra Fine Micro Grain Carbide

- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 6            | 25           | 75          | 6              | 6      | P-SFULVT0606       | .06        | .07    |
| 8            | 35           | 100         | 8              | 6      | P-SFULVT0806       | .06        | .07    |
| 10           | 45           | 100         | 10             | 6      | P-SFULVT1006       | .06        | .07    |
| 12           | 50           | 100         | 12             | 6      | P-SFULVT1206       | .06        | .07    |
| 16           | 65           | 150         | 16             | 6      | P-SFULVT1606       | .06        | .07    |
| 20           | 75           | 150         | 20             | 8      | P-SFULVT2008       | .06        | .07    |
| 25           | 80           | 150         | 25             | 8      | P-SFULVT2508       | .06        | .07    |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65**
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

2 刃  
切削  
條件表  
**P361**  
Cutting Condition

4 刃  
切削  
條件表  
**P386**  
Cutting Condition

## Square Type - Long Neck - 2&4 flutes

### ■ 2刃4刃深溝長頸立銑刀

**200 PLUS**

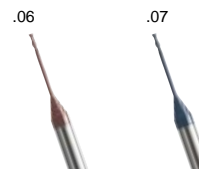
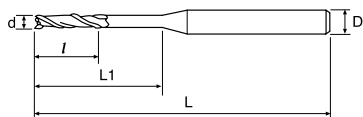
**HRC 65**

A D  
B C  
A#B#C#D

L3 L4  
L1#L3#L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 0.5          | 0.75         | 2                | 50          | 4              | 2      | P-SFULNT05022      | .06        | .07    |
| 0.5          | 0.75         | 4                | 50          | 4              | 2      | P-SFULNT05042      | .06        | .07    |
| 0.5          | 0.75         | 6                | 50          | 4              | 2      | P-SFULNT05062      | .06        | .07    |
| 0.6          | 0.9          | 2                | 50          | 4              | 2      | P-SFULNT06022      | .06        | .07    |
| 0.6          | 0.9          | 4                | 50          | 4              | 2      | P-SFULNT06042      | .06        | .07    |
| 0.6          | 0.9          | 6                | 50          | 4              | 2      | P-SFULNT06062      | .06        | .07    |
| 0.7          | 1.1          | 4                | 50          | 4              | 2      | P-SFULNT07042      | .06        | .07    |
| 0.7          | 1.1          | 6                | 50          | 4              | 2      | P-SFULNT07062      | .06        | .07    |
| 0.8          | 1.2          | 4                | 50          | 4              | 2      | P-SFULNT08042      | .06        | .07    |
| 0.8          | 1.2          | 6                | 50          | 4              | 2      | P-SFULNT08062      | .06        | .07    |
| 0.8          | 1.2          | 8                | 50          | 4              | 2      | P-SFULNT08082      | .06        | .07    |
| 1            | 1.5          | 6                | 50          | 4              | 4      | P-SFULNT10064      | .06        | .07    |
| 1            | 1.5          | 8                | 50          | 4              | 4      | P-SFULNT10084      | .06        | .07    |
| 1            | 1.5          | 10               | 50          | 4              | 4      | P-SFULNT10104      | .06        | .07    |
| 1            | 1.5          | 12               | 50          | 4              | 4      | P-SFULNT10124      | .06        | .07    |
| 1            | 1.5          | 16               | 50          | 4              | 4      | P-SFULNT10164      | .06        | .07    |
| 1.5          | 2.3          | 6                | 50          | 4              | 4      | P-SFULNT15064      | .06        | .07    |
| 1.5          | 2.3          | 8                | 50          | 4              | 4      | P-SFULNT15084      | .06        | .07    |
| 1.5          | 2.3          | 10               | 50          | 4              | 4      | P-SFULNT15104      | .06        | .07    |
| 1.5          | 2.3          | 12               | 50          | 4              | 4      | P-SFULNT15124      | .06        | .07    |
| 1.5          | 2.3          | 14               | 50          | 4              | 4      | P-SFULNT15144      | .06        | .07    |
| 1.5          | 2.3          | 16               | 50          | 4              | 4      | P-SFULNT15164      | .06        | .07    |
| 1.5          | 2.3          | 18               | 50          | 4              | 4      | P-SFULNT15184      | .06        | .07    |
| 1.5          | 2.3          | 20               | 50          | 4              | 4      | P-SFULNT15204      | .06        | .07    |
| 2            | 3            | 6                | 50          | 4              | 4      | P-SFULNT20064      | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm



## 200<sup>+</sup> 切削條件表 P386

Cutting Condition

### Square Type - Long Neck - 4 flutes

## 4刃深溝長頸立銑刀

200 PLUS

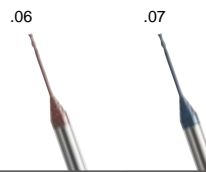
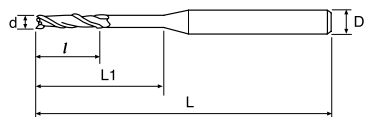
HRC 65

A D B C AFB#G#D

L3 L4 L1#L2#L3#L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刀徑         | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 2            | 3            | 8                | 50          | 4              | 4      | P-SFULNT20084      | .06        | .07    |
| 2            | 3            | 10               | 50          | 4              | 4      | P-SFULNT20104      | .06        | .07    |
| 2            | 3            | 12               | 50          | 4              | 4      | P-SFULNT20124      | .06        | .07    |
| 2            | 3            | 14               | 50          | 4              | 4      | P-SFULNT20144      | .06        | .07    |
| 2            | 3            | 16               | 50          | 4              | 4      | P-SFULNT20164      | .06        | .07    |
| 2            | 3            | 18               | 50          | 4              | 4      | P-SFULNT20184      | .06        | .07    |
| 2            | 3            | 20               | 50          | 4              | 4      | P-SFULNT20204      | .06        | .07    |
| 2.5          | 4            | 8                | 50          | 4              | 4      | P-SFULNT25084      | .06        | .07    |
| 2.5          | 4            | 10               | 50          | 4              | 4      | P-SFULNT25104      | .06        | .07    |
| 2.5          | 4            | 12               | 50          | 4              | 4      | P-SFULNT25124      | .06        | .07    |
| 2.5          | 4            | 14               | 50          | 4              | 4      | P-SFULNT25144      | .06        | .07    |
| 2.5          | 4            | 16               | 50          | 4              | 4      | P-SFULNT25164      | .06        | .07    |
| 2.5          | 4            | 20               | 50          | 4              | 4      | P-SFULNT25204      | .06        | .07    |
| 3            | 4.5          | 8                | 50          | 6              | 4      | P-SFULNT30084      | .06        | .07    |
| 3            | 4.5          | 10               | 50          | 6              | 4      | P-SFULNT30104      | .06        | .07    |
| 3            | 4.5          | 12               | 50          | 6              | 4      | P-SFULNT30124      | .06        | .07    |
| 3            | 4.5          | 16               | 60          | 6              | 4      | P-SFULNT30164      | .06        | .07    |
| 3            | 4.5          | 20               | 60          | 6              | 4      | P-SFULNT30204      | .06        | .07    |
| 3            | 4.5          | 25               | 75          | 6              | 4      | P-SFULNT30254      | .06        | .07    |
| 4            | 6            | 12               | 50          | 6              | 4      | P-SFULNT40124      | .06        | .07    |
| 4            | 6            | 16               | 60          | 6              | 4      | P-SFULNT40164      | .06        | .07    |
| 4            | 6            | 20               | 75          | 6              | 4      | P-SFULNT40204      | .06        | .07    |
| 4            | 6            | 25               | 75          | 6              | 4      | P-SFULNT40254      | .06        | .07    |
| 4            | 6            | 30               | 75          | 6              | 4      | P-SFULNT40304      | .06        | .07    |
| 4            | 6            | 35               | 75          | 6              | 4      | P-SFULNT40354      | .06        | .07    |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質 :

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|------------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                      | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                      | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P387**  
Cutting Condition

## Miniature Ball Nose Type - 2 flutes

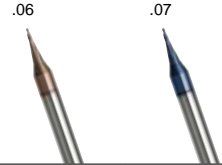
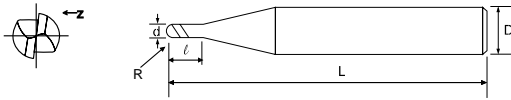
### 2刃微小徑球型立銑刀

**200 PLUS** **HRC > 60**



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACo |
| 0.3          | 0.15   | 0.6          | 38          | 3              | 2      | P-SFUMIB0033       | .06        | .07    |
| 0.4          | 0.2    | 0.8          | 38          | 3              | 2      | P-SFUMIB0043       | .06        | .07    |
| 0.5          | 0.25   | 1            | 38          | 3              | 2      | P-SFUMIB0053       | .06        | .07    |
| 0.6          | 0.3    | 1.2          | 38          | 3              | 2      | P-SFUMIB0063       | .06        | .07    |
| 0.7          | 0.35   | 1.4          | 38          | 3              | 2      | P-SFUMIB0073       | .06        | .07    |
| 0.8          | 0.4    | 1.6          | 38          | 3              | 2      | P-SFUMIB0083       | .06        | .07    |
| 1            | 0.5    | 2            | 38          | 3              | 2      | P-SFUMIB0103       | .06        | .07    |
| 1.2          | 0.6    | 2.5          | 38          | 3              | 2      | P-SFUMIB0123       | .06        | .07    |
| 1.4          | 0.7    | 3            | 38          | 3              | 2      | P-SFUMIB0143       | .06        | .07    |
| 1.5          | 0.75   | 3            | 38          | 3              | 2      | P-SFUMIB0153       | .06        | .07    |
| 1.6          | 0.8    | 3.5          | 38          | 3              | 2      | P-SFUMIB0163       | .06        | .07    |
| 1.8          | 0.9    | 4            | 38          | 3              | 2      | P-SFUMIB0183       | .06        | .07    |
| 2            | 1      | 4            | 38          | 3              | 2      | P-SFUMIB0203       | .06        | .07    |
| 2.2          | 1.1    | 4.5          | 38          | 3              | 2      | P-SFUMIB0223       | .06        | .07    |
| 2.4          | 1.2    | 5            | 38          | 3              | 2      | P-SFUMIB0243       | .06        | .07    |
| 2.5          | 1.25   | 5            | 38          | 3              | 2      | P-SFUMIB0253       | .06        | .07    |
| 3            | 1.5    | 6            | 38          | 3              | 2      | P-SFUMIB0303       | .06        | .07    |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P387**  
Cutting Condition

## Miniature Ball Nose Type - 2 flutes

### ■ 2刃微小徑球型立銑刀

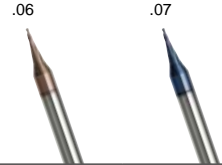
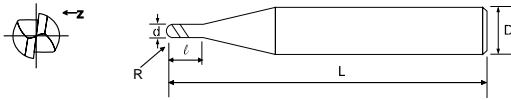
**200 PLUS**

**HRC 60**



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACo |
| 0.3          | 0.15   | 0.6          | 50          | 4              | 2      | P-SFUMIB0034       | .06        | .07    |
| 0.4          | 0.2    | 0.8          | 50          | 4              | 2      | P-SFUMIB0044       | .06        | .07    |
| 0.5          | 0.25   | 1            | 50          | 4              | 2      | P-SFUMIB0054       | .06        | .07    |
| 0.6          | 0.3    | 1.2          | 50          | 4              | 2      | P-SFUMIB0064       | .06        | .07    |
| 0.7          | 0.35   | 1.4          | 50          | 4              | 2      | P-SFUMIB0074       | .06        | .07    |
| 0.8          | 0.4    | 1.6          | 50          | 4              | 2      | P-SFUMIB0084       | .06        | .07    |
| 1            | 0.5    | 2            | 50          | 4              | 2      | P-SFUMIB0104       | .06        | .07    |
| 1.2          | 0.6    | 2.5          | 50          | 4              | 2      | P-SFUMIB0124       | .06        | .07    |
| 1.4          | 0.7    | 3            | 50          | 4              | 2      | P-SFUMIB0144       | .06        | .07    |
| 1.5          | 0.75   | 3            | 50          | 4              | 2      | P-SFUMIB0154       | .06        | .07    |
| 1.6          | 0.8    | 3.5          | 50          | 4              | 2      | P-SFUMIB0164       | .06        | .07    |
| 1.8          | 0.9    | 4            | 50          | 4              | 2      | P-SFUMIB0184       | .06        | .07    |
| 2            | 1      | 4            | 50          | 4              | 2      | P-SFUMIB0204       | .06        | .07    |
| 2.2          | 1.1    | 4.5          | 50          | 4              | 2      | P-SFUMIB0224       | .06        | .07    |
| 2.4          | 1.2    | 5            | 50          | 4              | 2      | P-SFUMIB0244       | .06        | .07    |
| 2.5          | 1.25   | 5            | 50          | 4              | 2      | P-SFUMIB0254       | .06        | .07    |
| 3            | 1.5    | 6            | 50          | 4              | 2      | P-SFUMIB0304       | .06        | .07    |



Application 適用材質：

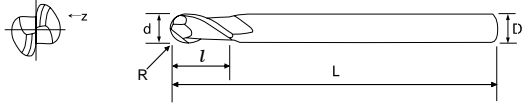
★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P388**  
Cutting Condition

## Ball Nose Type - 2 flutes ■ 2 刃球型立銑刀



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 1            | 0.5    | 1.5          | 50          | 4              | 2      | P-SFUBT0102        | .06        | .07    |
| 1.5          | 0.75   | 2.5          | 50          | 4              | 2      | P-SFUBT0152        | .06        | .07    |
| 2            | 1      | 3            | 50          | 4              | 2      | P-SFUBT0202        | .06        | .07    |
| 2.5          | 1.25   | 4            | 50          | 4              | 2      | P-SFUBT0252        | .06        | .07    |
| 3            | 1.5    | 4.5          | 50          | 4              | 2      | P-SFUBT0302        | .06        | .07    |
| 4            | 2      | 6            | 50          | 4              | 2      | P-SFUBT0402        | .06        | .07    |
| 5            | 2.5    | 7.5          | 50          | 6              | 2      | P-SFUBT0502        | .06        | .07    |
| 6            | 3      | 9            | 50          | 6              | 2      | P-SFUBT0602        | .06        | .07    |
| 7            | 3.5    | 14           | 60          | 8              | 2      | P-SFUBT0702        | .06        | .07    |
| 8            | 4      | 12           | 60          | 8              | 2      | P-SFUBT0802        | .06        | .07    |
| 9            | 4.5    | 18           | 75          | 10             | 2      | P-SFUBT0902        | .06        | .07    |
| 10           | 5      | 15           | 75          | 10             | 2      | P-SFUBT1002        | .06        | .07    |
| 12           | 6      | 18           | 75          | 12             | 2      | P-SFUBT1202        | .06        | .07    |
| 14           | 7      | 24           | 80          | 16             | 2      | P-SFUBT1402        | .06        | .07    |
| 16           | 8      | 24           | 100         | 16             | 2      | P-SFUBT1602        | .06        | .07    |
| 20           | 10     | 30           | 150         | 20             | 2      | P-SFUBT2002        | .06        | .07    |
| 25           | 12.5   | 35           | 150         | 25             | 2      | P-SFUBT2502        | .06        | .07    |



High precision radius accuracy request is available  
高精度R值可訂製

Application 適用材質：

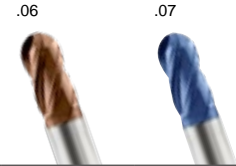
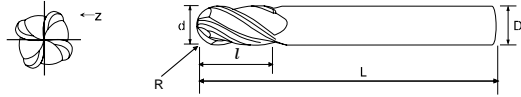
★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P388**  
Cutting Condition

## Ball Nose Type - 4 flutes ■ 4 刃球型立銑刀



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | 刃長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 1            | 0.5    | 1.5          | 50          | 4              | 4      | P-SFUBT0104        | .06        | .07    |
| 1.5          | 0.75   | 3            | 50          | 4              | 4      | P-SFUBT0104        | .06        | .07    |
| 2            | 1      | 3            | 50          | 4              | 4      | P-SFUBT0204        | .06        | .07    |
| 2.5          | 1.25   | 5            | 50          | 4              | 4      | P-SFUBT0254        | .06        | .07    |
| 3            | 1.5    | 4.5          | 50          | 4              | 4      | P-SFUBT0304        | .06        | .07    |
| 4            | 2      | 6            | 50          | 4              | 4      | P-SFUBT0404        | .06        | .07    |
| 5            | 2.5    | 7.5          | 50          | 6              | 4      | P-SFUBT0504        | .06        | .07    |
| 6            | 3      | 9            | 50          | 6              | 4      | P-SFUBT0604        | .06        | .07    |
| 6            | 3      | 9            | 75          | 6              | 4      | P-SFUBT0614        | .06        | .07    |
| 8            | 4      | 12           | 60          | 8              | 4      | P-SFUBT0804        | .06        | .07    |
| 10           | 5      | 15           | 75          | 10             | 4      | P-SFUBT1004        | .06        | .07    |
| 10           | 5      | 20           | 100         | 10             | 4      | P-SFUBT1014        | .06        | .07    |
| 12           | 6      | 18           | 75          | 12             | 4      | P-SFUBT1204        | .06        | .07    |
| 12           | 6      | 24           | 100         | 12             | 4      | P-SFUBT1214        | .06        | .07    |
| 14           | 7      | 28           | 100         | 16             | 4      | P-SFUBT1404        | .06        | .07    |
| 16           | 8      | 24           | 100         | 16             | 4      | P-SFUBT1604        | .06        | .07    |
| 20           | 10     | 40           | 150         | 20             | 4      | P-SFUBT2004        | .06        | .07    |
| 25           | 12.5   | 50           | 150         | 25             | 4      | P-SFUBT2504        | .06        | .07    |

**R** High precision radius accuracy request is available  
±0.003 高精度R值可訂製

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

## 200<sup>+</sup> 切削條件表 P389 Cutting Condition

### Ball Nose Type - Short Flute - 2 flutes

## ■ 2刃短刃強力球型立銑刀

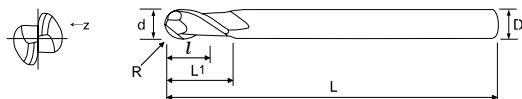
200 PLUS

HRC 65



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | 刃長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 1            | 0.5    | 1            | 2.5              | 50          | 4              | 2      | P-SFUBTSX010       | .06        | .07    |
| 1.5          | 0.75   | 1.5          | 4                | 50          | 4              | 2      | P-SFUBTSX015       | .06        | .07    |
| 2            | 1      | 2            | 5                | 50          | 4              | 2      | P-SFUBTSX020       | .06        | .07    |
| 2.5          | 1.25   | 2.5          | 6                | 50          | 4              | 2      | P-SFUBTSX025       | .06        | .07    |
| 3            | 1.5    | 3            | 8                | 50          | 4              | 2      | P-SFUBTSX030       | .06        | .07    |
| 3            | 1.5    | 3            | 8                | 50          | 6              | 2      | P-SFUBTSX630       | .06        | .07    |
| 3.5          | 1.75   | 3.5          | 8                | 50          | 4              | 2      | P-SFUBTSX035       | .06        | .07    |
| 4            | 2      | 4            | 10               | 50          | 4              | 2      | P-SFUBTSX040       | .06        | .07    |
| 4            | 2      | 4            | 10               | 50          | 6              | 2      | P-SFUBTSX640       | .06        | .07    |
| 4.5          | 2.25   | 4.5          | 11               | 50          | 6              | 2      | P-SFUBTSX045       | .06        | .07    |
| 5            | 2.5    | 5            | 13               | 50          | 6              | 2      | P-SFUBTSX050       | .06        | .07    |
| 5.5          | 2.75   | 5.5          | 14               | 50          | 6              | 2      | P-SFUBTSX055       | .06        | .07    |
| 6            | 3      | 6            | 15               | 50          | 6              | 2      | P-SFUBTSX060       | .06        | .07    |
| 7            | 3.5    | 7            | 16               | 60          | 8              | 2      | P-SFUBTSX070       | .06        | .07    |
| 8            | 4      | 8            | 20               | 60          | 8              | 2      | P-SFUBTSX080       | .06        | .07    |
| 9            | 4.5    | 9            | 22               | 75          | 10             | 2      | P-SFUBTSX090       | .06        | .07    |
| 10           | 5      | 10           | 25               | 75          | 10             | 2      | P-SFUBTSX100       | .06        | .07    |
| 12           | 6      | 12           | 30               | 75          | 12             | 2      | P-SFUBTSX120       | .06        | .07    |
| 14           | 7      | 14           | 35               | 75          | 16             | 2      | P-SFUBTSX140       | .06        | .07    |
| 16           | 8      | 16           | 40               | 100         | 16             | 2      | P-SFUBTSX160       | .06        | .07    |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P389**  
Cutting Condition

## Ball Nose Type - Long Shank - 2 flutes

### 2刃長柄球型立銑刀

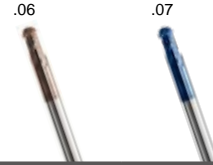
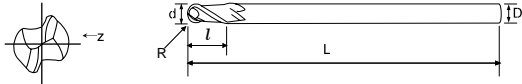
**200 PLUS**

**HRC 65**



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACo |
| 1            | 0.5    | 3            | 75          | 6              | 2      | P-SFULBT0102       | .06        | .07    |
| 2            | 1      | 4            | 75          | 6              | 2      | P-SFULBT0202       | .06        | .07    |
| 3            | 1.5    | 5            | 75          | 6              | 2      | P-SFULBT0302       | .06        | .07    |
| 4            | 2      | 6            | 75          | 6              | 2      | P-SFULBT0402       | .06        | .07    |
| 5            | 2.5    | 8            | 75          | 6              | 2      | P-SFULBT0502       | .06        | .07    |
| 6            | 3      | 9            | 75          | 6              | 2      | P-SFULBT0602       | .06        | .07    |
| 6            | 3      | 9            | 100         | 6              | 2      | P-SFULBT0612       | .06        | .07    |
| 7            | 3.5    | 14           | 75          | 8              | 2      | P-SFULBT0702       | .06        | .07    |
| 8            | 4      | 16           | 75          | 8              | 2      | P-SFULBT0802       | .06        | .07    |
| 8            | 4      | 16           | 100         | 8              | 2      | P-SFULBT0812       | .06        | .07    |
| 9            | 4.5    | 18           | 100         | 10             | 2      | P-SFULBT0902       | .06        | .07    |
| 10           | 5      | 20           | 100         | 10             | 2      | P-SFULBT1002       | .06        | .07    |
| 10           | 5      | 20           | 150         | 10             | 2      | P-SFULBT1012       | .06        | .07    |
| 12           | 6      | 24           | 100         | 12             | 2      | P-SFULBT1202       | .06        | .07    |
| 12           | 6      | 24           | 150         | 12             | 2      | P-SFULBT1212       | .06        | .07    |
| 14           | 7      | 28           | 100         | 16             | 2      | P-SFULBT1402       | .06        | .07    |
| 16           | 8      | 32           | 150         | 16             | 2      | P-SFULBT1602       | .06        | .07    |
| 16           | 8      | 32           | 200         | 16             | 2      | P-SFULBT1612       | .06        | .07    |
| 20           | 10     | 40           | 200         | 20             | 2      | P-SFULBT2002       | .06        | .07    |
| 25           | 12.5   | 50           | 200         | 25             | 2      | P-SFULBT2502       | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 P366-367  
Cutting Condition

## Ball Nose Type - Long Neck - 2 flutes

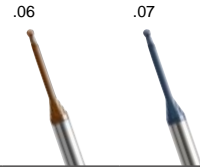
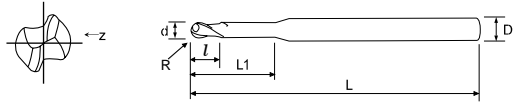
### 2刃深溝長頸球型立銑刀

**200 PLUS** **HRC 65**



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 0.5          | 0.25   | 0.75         | 2                | 50          | 4              | 2      | P-SFULNBT05022     | .06        | .07    |
| 0.5          | 0.25   | 0.75         | 4                | 50          | 4              | 2      | P-SFULNBT05042     | .06        | .07    |
| 0.5          | 0.25   | 0.75         | 6                | 50          | 4              | 2      | P-SFULNBT05062     | .06        | .07    |
| 0.6          | 0.3    | 0.9          | 2                | 50          | 4              | 2      | P-SFULNBT06022     | .06        | .07    |
| 0.6          | 0.3    | 0.9          | 4                | 50          | 4              | 2      | P-SFULNBT06042     | .06        | .07    |
| 0.6          | 0.3    | 0.9          | 6                | 50          | 4              | 2      | P-SFULNBT06062     | .06        | .07    |
| 0.8          | 0.4    | 1.2          | 4                | 50          | 4              | 2      | P-SFULNBT08042     | .06        | .07    |
| 0.8          | 0.4    | 1.2          | 6                | 50          | 4              | 2      | P-SFULNBT08062     | .06        | .07    |
| 0.8          | 0.4    | 1.2          | 8                | 50          | 4              | 2      | P-SFULNBT08082     | .06        | .07    |
| 1            | 0.5    | 1.5          | 6                | 50          | 4              | 2      | P-SFULNBT10062     | .06        | .07    |
| 1            | 0.5    | 1.5          | 8                | 50          | 4              | 2      | P-SFULNBT10082     | .06        | .07    |
| 1            | 0.5    | 1.5          | 10               | 50          | 4              | 2      | P-SFULNBT10102     | .06        | .07    |
| 1            | 0.5    | 1.5          | 12               | 50          | 4              | 2      | P-SFULNBT10122     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 6                | 50          | 4              | 2      | P-SFULNBT15062     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 8                | 50          | 4              | 2      | P-SFULNBT15082     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 10               | 50          | 4              | 2      | P-SFULNBT15102     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 12               | 50          | 4              | 2      | P-SFULNBT15122     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 14               | 50          | 4              | 2      | P-SFULNBT15142     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 16               | 50          | 4              | 2      | P-SFULNBT15162     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 18               | 50          | 4              | 2      | P-SFULNBT15182     | .06        | .07    |
| 1.5          | 0.75   | 2.3          | 20               | 50          | 4              | 2      | P-SFULNBT15202     | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm



# 200<sup>+</sup>

切削條件表 P366-367  
Cutting Condition

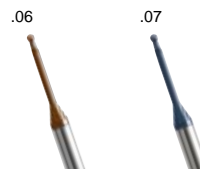
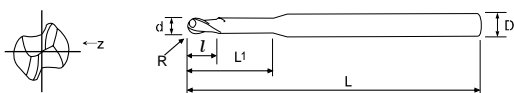
## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 2            | 1      | 3            | 8                | 50          | 4              | 2      | P-SFULNBT20082     | .06        | .07    |
| 2            | 1      | 3            | 10               | 50          | 4              | 2      | P-SFULNBT20102     | .06        | .07    |
| 2            | 1      | 3            | 12               | 50          | 4              | 2      | P-SFULNBT20122     | .06        | .07    |
| 2            | 1      | 3            | 14               | 50          | 4              | 2      | P-SFULNBT20142     | .06        | .07    |
| 2            | 1      | 3            | 16               | 50          | 4              | 2      | P-SFULNBT20162     | .06        | .07    |
| 2            | 1      | 3            | 18               | 50          | 4              | 2      | P-SFULNBT20182     | .06        | .07    |
| 2            | 1      | 3            | 20               | 50          | 4              | 2      | P-SFULNBT20202     | .06        | .07    |
| 2.5          | 1.25   | 4            | 8                | 50          | 4              | 2      | P-SFULNBT25082     | .06        | .07    |
| 2.5          | 1.25   | 4            | 12               | 50          | 4              | 2      | P-SFULNBT25122     | .06        | .07    |
| 2.5          | 1.25   | 4            | 16               | 50          | 4              | 2      | P-SFULNBT25162     | .06        | .07    |
| 3            | 1.5    | 4.5          | 10               | 50          | 6              | 2      | P-SFULNBT30102     | .06        | .07    |
| 3            | 1.5    | 4.5          | 12               | 50          | 6              | 2      | P-SFULNBT30122     | .06        | .07    |
| 3            | 1.5    | 4.5          | 16               | 60          | 6              | 2      | P-SFULNBT30162     | .06        | .07    |
| 3            | 1.5    | 4.5          | 20               | 60          | 6              | 2      | P-SFULNBT30202     | .06        | .07    |
| 3            | 1.5    | 4.5          | 25               | 75          | 6              | 2      | P-SFULNBT30252     | .06        | .07    |
| 4            | 2      | 6            | 12               | 50          | 6              | 2      | P-SFULNBT40122     | .06        | .07    |
| 4            | 2      | 6            | 16               | 60          | 6              | 2      | P-SFULNBT40162     | .06        | .07    |
| 4            | 2      | 6            | 20               | 75          | 6              | 2      | P-SFULNBT40202     | .06        | .07    |
| 4            | 2      | 6            | 25               | 75          | 6              | 2      | P-SFULNBT40252     | .06        | .07    |
| 4            | 2      | 6            | 30               | 75          | 6              | 2      | P-SFULNBT40302     | .06        | .07    |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 **P390**  
Cutting Condition

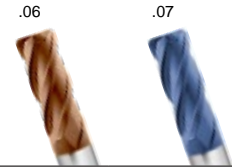
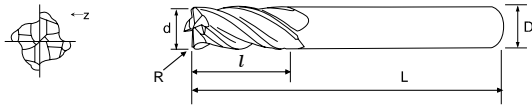
## Corner Radius Type - 4 flutes

### 4 刃圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nAco |
| 4            | 0.2           | 9            | 50          | 6              | 4      | P-SFURTA04024      | .06        | .07    |
| 4            | 0.5           | 9            | 50          | 6              | 4      | P-SFURTA04054      | .06        | .07    |
| 6            | 0.5           | 15           | 50          | 6              | 4      | P-SFURTA06054      | .06        | .07    |
| 6            | 1             | 15           | 50          | 6              | 4      | P-SFURTA06104      | .06        | .07    |
| 8            | 0.5           | 19           | 60          | 8              | 4      | P-SFURTA08054      | .06        | .07    |
| 8            | 1             | 19           | 60          | 8              | 4      | P-SFURTA08104      | .06        | .07    |
| 10           | 0.5           | 22           | 75          | 10             | 4      | P-SFURTA10054      | .06        | .07    |
| 10           | 1             | 22           | 75          | 10             | 4      | P-SFURTA10104      | .06        | .07    |
| 10           | 2             | 22           | 75          | 10             | 4      | P-SFURTA10204      | .06        | .07    |
| 12           | 0.5           | 26           | 75          | 12             | 4      | P-SFURTA12054      | .06        | .07    |
| 12           | 1             | 26           | 75          | 12             | 4      | P-SFURTA12104      | .06        | .07    |
| 12           | 2             | 26           | 75          | 12             | 4      | P-SFURTA12204      | .06        | .07    |

## Patent

Patent of Japan No: Nr.3145278  
獲日本專利 字號：Nr.3145278

Patent of Taiwan No: M 303075  
獲台灣專利 字號：新型第 M 303075 號



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P391**  
Cutting Condition

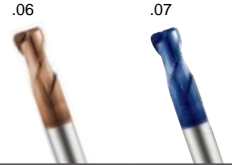
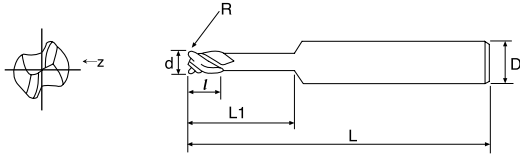
## Corner Radius Type - Long Neck & Shank - 2 flutes

### 2刃長頸長柄圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 6            | 0.2           | 9            | 18               | 75          | 6              | 2      | P-SFUCRM060022     | .06        | .07    |
| 6            | 0.3           | 9            | 18               | 75          | 6              | 2      | P-SFUCRM060032     | .06        | .07    |
| 6            | 0.5           | 9            | 18               | 75          | 6              | 2      | P-SFUCRM060052     | .06        | .07    |
| 6            | 1             | 9            | 18               | 75          | 6              | 2      | P-SFUCRM060102     | .06        | .07    |
| 6            | 2             | 9            | 18               | 75          | 6              | 2      | P-SFUCRM060202     | .06        | .07    |
| 8            | 0.3           | 12           | 20               | 100         | 8              | 2      | P-SFUCRM080032     | .06        | .07    |
| 8            | 0.5           | 12           | 20               | 100         | 8              | 2      | P-SFUCRM080052     | .06        | .07    |
| 8            | 1             | 12           | 20               | 100         | 8              | 2      | P-SFUCRM080102     | .06        | .07    |
| 8            | 2             | 12           | 20               | 100         | 8              | 2      | P-SFUCRM080202     | .06        | .07    |
| 10           | 0.5           | 15           | 25               | 100         | 10             | 2      | P-SFUCRM100052     | .06        | .07    |
| 10           | 1             | 15           | 25               | 100         | 10             | 2      | P-SFUCRM100102     | .06        | .07    |
| 10           | 1.5           | 15           | 25               | 100         | 10             | 2      | P-SFUCRM100152     | .06        | .07    |
| 10           | 2             | 15           | 25               | 100         | 10             | 2      | P-SFUCRM100202     | .06        | .07    |
| 10           | 3             | 15           | 25               | 100         | 10             | 2      | P-SFUCRM100302     | .06        | .07    |
| 12           | 0.5           | 18           | 30               | 100         | 12             | 2      | P-SFUCRM120052     | .06        | .07    |
| 12           | 1             | 18           | 30               | 100         | 12             | 2      | P-SFUCRM120102     | .06        | .07    |
| 12           | 1.5           | 18           | 30               | 100         | 12             | 2      | P-SFUCRM120152     | .06        | .07    |
| 12           | 2             | 18           | 30               | 100         | 12             | 2      | P-SFUCRM120202     | .06        | .07    |
| 12           | 3             | 18           | 30               | 100         | 12             | 2      | P-SFUCRM120302     | .06        | .07    |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 P392  
Cutting Condition

## Corner Radius Type - Long Neck & Shank - 4 flutes

### 4刃長頸長柄圓鼻立銑刀

200 PLUS

HRC 65

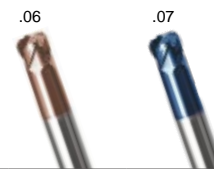
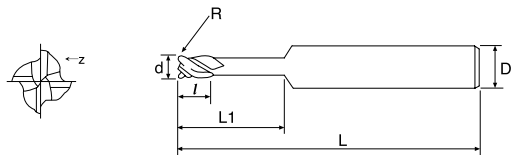
R

A D  
B C  
A+B+C+D

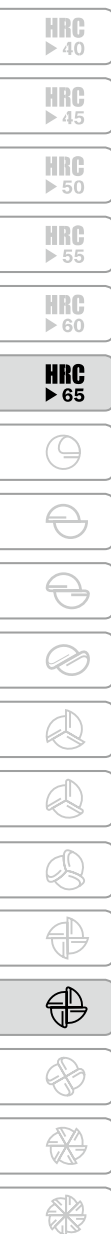
L3 L4  
L1 L2 L3 L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACO |
| 6            | 0.2           | 9            | 18               | 75          | 6              | 4      | P-SFUCRM060024     | .06        | .07    |
| 6            | 0.3           | 9            | 18               | 75          | 6              | 4      | P-SFUCRM060034     | .06        | .07    |
| 6            | 0.5           | 9            | 18               | 75          | 6              | 4      | P-SFUCRM060054     | .06        | .07    |
| 6            | 1             | 9            | 18               | 75          | 6              | 4      | P-SFUCRM060104     | .06        | .07    |
| 6            | 2             | 9            | 18               | 75          | 6              | 4      | P-SFUCRM060204     | .06        | .07    |
| 8            | 0.3           | 12           | 20               | 100         | 8              | 4      | P-SFUCRM080034     | .06        | .07    |
| 8            | 0.5           | 12           | 20               | 100         | 8              | 4      | P-SFUCRM080054     | .06        | .07    |
| 8            | 1             | 12           | 20               | 100         | 8              | 4      | P-SFUCRM080104     | .06        | .07    |
| 8            | 2             | 12           | 20               | 100         | 8              | 4      | P-SFUCRM080204     | .06        | .07    |
| 10           | 0.5           | 15           | 25               | 100         | 10             | 4      | P-SFUCRM100054     | .06        | .07    |
| 10           | 1             | 15           | 25               | 100         | 10             | 4      | P-SFUCRM100104     | .06        | .07    |
| 10           | 1.5           | 15           | 25               | 100         | 10             | 4      | P-SFUCRM100154     | .06        | .07    |
| 10           | 2             | 15           | 25               | 100         | 10             | 4      | P-SFUCRM100204     | .06        | .07    |
| 10           | 3             | 15           | 25               | 100         | 10             | 4      | P-SFUCRM100304     | .06        | .07    |
| 12           | 0.5           | 18           | 30               | 100         | 12             | 4      | P-SFUCRM120054     | .06        | .07    |
| 12           | 1             | 18           | 30               | 100         | 12             | 4      | P-SFUCRM120104     | .06        | .07    |
| 12           | 1.5           | 18           | 30               | 100         | 12             | 4      | P-SFUCRM120154     | .06        | .07    |
| 12           | 2             | 18           | 30               | 100         | 12             | 4      | P-SFUCRM120204     | .06        | .07    |
| 12           | 3             | 18           | 30               | 100         | 12             | 4      | P-SFUCRM120304     | .06        | .07    |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P393**  
Cutting Condition

## Pencil Neck Type - Corner Radius - 2 flutes

### 2刃斜頸圓鼻立銑刀

200 PLUS

HRC 65

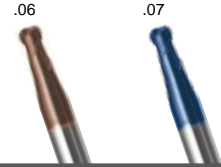
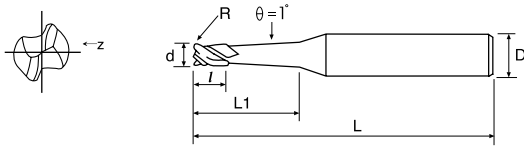
R

A A≠B B

L3 L4 L1≠L2≠L3≠L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACo |
| 1            | 0.2           | 1            | 3                | 50          | 4              | 2      | P-SFUCRS010022     | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 4.5              | 50          | 4              | 2      | P-SFUCRS015022     | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 4.5              | 50          | 4              | 2      | P-SFUCRS015032     | .06        | .07    |
| 2            | 0.2           | 2            | 6                | 50          | 4              | 2      | P-SFUCRS020022     | .06        | .07    |
| 2            | 0.3           | 2            | 6                | 50          | 4              | 2      | P-SFUCRS020032     | .06        | .07    |
| 2            | 0.5           | 2            | 6                | 50          | 4              | 2      | P-SFUCRS020052     | .06        | .07    |
| 3            | 0.2           | 3            | 9                | 50          | 6              | 2      | P-SFUCRS030022     | .06        | .07    |
| 3            | 0.3           | 3            | 9                | 50          | 6              | 2      | P-SFUCRS030032     | .06        | .07    |
| 3            | 0.5           | 3            | 9                | 50          | 6              | 2      | P-SFUCRS030052     | .06        | .07    |
| 3            | 1             | 3            | 9                | 50          | 6              | 2      | P-SFUCRS030102     | .06        | .07    |
| 4            | 0.2           | 4            | 12               | 50          | 6              | 2      | P-SFUCRS040022     | .06        | .07    |
| 4            | 0.3           | 4            | 12               | 50          | 6              | 2      | P-SFUCRS040032     | .06        | .07    |
| 4            | 0.5           | 4            | 12               | 50          | 6              | 2      | P-SFUCRS040052     | .06        | .07    |
| 4            | 1             | 4            | 12               | 50          | 6              | 2      | P-SFUCRS040102     | .06        | .07    |
| 5            | 0.3           | 5            | 15               | 50          | 6              | 2      | P-SFUCRS050032     | .06        | .07    |
| 5            | 0.5           | 5            | 15               | 50          | 6              | 2      | P-SFUCRS050052     | .06        | .07    |
| 5            | 1             | 5            | 15               | 50          | 6              | 2      | P-SFUCRS050102     | .06        | .07    |
| 6            | 0.2           | 6            | 18               | 50          | 6              | 2      | P-SFUCRS060022     | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P393**  
Cutting Condition

## Pencil Neck Type – Corner Radius - 2 flutes

### 2 刃斜頸圓鼻立銑刀

200 PLUS

HRC 65

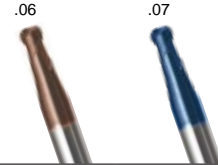
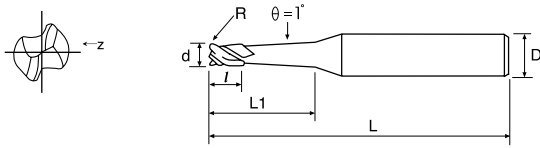
R

A B A+B

L1, L2, L3, L4 L1≠L2≠L3≠L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACO |
| 6            | 0.3           | 6            | 18               | 50          | 6              | 2      | P-SFUCRS060032     | .06        | .07    |
| 6            | 0.5           | 6            | 18               | 50          | 6              | 2      | P-SFUCRS060052     | .06        | .07    |
| 6            | 1             | 6            | 18               | 50          | 6              | 2      | P-SFUCRS060102     | .06        | .07    |
| 6            | 2             | 6            | 18               | 50          | 6              | 2      | P-SFUCRS060202     | .06        | .07    |
| 8            | 0.3           | 8            | 20               | 60          | 8              | 2      | P-SFUCRS080032     | .06        | .07    |
| 8            | 0.5           | 8            | 20               | 60          | 8              | 2      | P-SFUCRS080052     | .06        | .07    |
| 8            | 1             | 8            | 20               | 60          | 8              | 2      | P-SFUCRS080102     | .06        | .07    |
| 8            | 2             | 8            | 20               | 60          | 8              | 2      | P-SFUCRS080202     | .06        | .07    |
| 10           | 0.5           | 10           | 25               | 75          | 10             | 2      | P-SFUCRS100052     | .06        | .07    |
| 10           | 1             | 10           | 25               | 75          | 10             | 2      | P-SFUCRS100102     | .06        | .07    |
| 10           | 1.5           | 10           | 25               | 75          | 10             | 2      | P-SFUCRS100152     | .06        | .07    |
| 10           | 2             | 10           | 25               | 75          | 10             | 2      | P-SFUCRS100202     | .06        | .07    |
| 10           | 3             | 10           | 25               | 75          | 10             | 2      | P-SFUCRS100302     | .06        | .07    |
| 12           | 0.5           | 12           | 30               | 75          | 12             | 2      | P-SFUCRS120052     | .06        | .07    |
| 12           | 1             | 12           | 30               | 75          | 12             | 2      | P-SFUCRS120102     | .06        | .07    |
| 12           | 1.5           | 12           | 30               | 75          | 12             | 2      | P-SFUCRS120152     | .06        | .07    |
| 12           | 2             | 12           | 30               | 75          | 12             | 2      | P-SFUCRS120202     | .06        | .07    |
| 12           | 3             | 12           | 30               | 75          | 12             | 2      | P-SFUCRS120302     | .06        | .07    |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P394**  
Cutting Condition

## Pencil Neck Type – Corner Radius - 4 flutes

### 4刃斜頸圓鼻立銑刀

200 PLUS

HRC 65

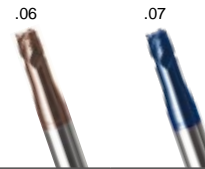
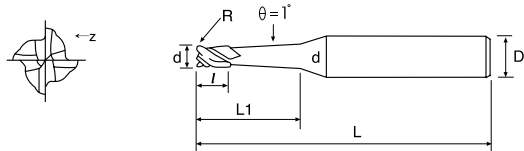
R

A D  
B C  
A≠B≠C≠D

L3 L4  
L1≠L3≠L4  
L1≠L2

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TiSiN+     | P-nACo |
| 2            | 0.2           | 2            | 6                | 50          | 4              | 4      | P-SFUCRS020024     | .06        | .07    |
| 2            | 0.3           | 2            | 6                | 50          | 4              | 4      | P-SFUCRS020034     | .06        | .07    |
| 2            | 0.5           | 2            | 6                | 50          | 4              | 4      | P-SFUCRS020054     | .06        | .07    |
| 3            | 0.2           | 3            | 9                | 50          | 6              | 4      | P-SFUCRS030024     | .06        | .07    |
| 3            | 0.3           | 3            | 9                | 50          | 6              | 4      | P-SFUCRS030034     | .06        | .07    |
| 3            | 0.5           | 3            | 9                | 50          | 6              | 4      | P-SFUCRS030054     | .06        | .07    |
| 3            | 1             | 3            | 9                | 50          | 6              | 4      | P-SFUCRS030104     | .06        | .07    |
| 4            | 0.2           | 4            | 12               | 50          | 6              | 4      | P-SFUCRS040024     | .06        | .07    |
| 4            | 0.3           | 4            | 12               | 50          | 6              | 4      | P-SFUCRS040034     | .06        | .07    |
| 4            | 0.5           | 4            | 12               | 50          | 6              | 4      | P-SFUCRS040054     | .06        | .07    |
| 4            | 1             | 4            | 12               | 50          | 6              | 4      | P-SFUCRS040104     | .06        | .07    |
| 5            | 0.3           | 5            | 15               | 50          | 6              | 4      | P-SFUCRS050034     | .06        | .07    |
| 5            | 0.5           | 5            | 15               | 50          | 6              | 4      | P-SFUCRS050054     | .06        | .07    |
| 5            | 1             | 5            | 15               | 50          | 6              | 4      | P-SFUCRS050104     | .06        | .07    |
| 6            | 0.2           | 6            | 18               | 50          | 6              | 4      | P-SFUCRS060024     | .06        | .07    |
| 6            | 0.3           | 6            | 18               | 50          | 6              | 4      | P-SFUCRS060034     | .06        | .07    |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P394**  
Cutting Condition

## Pencil Neck Type - Corner Radius - 4 flutes

### 4刃斜頸圓鼻立銑刀

200 PLUS

HRC 65

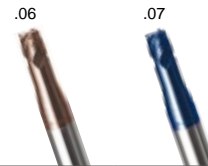
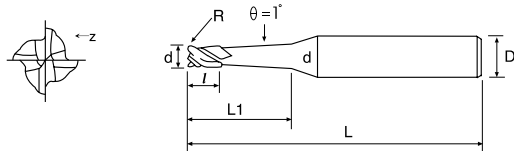
R

A D  
B C  
A≠B≠C≠D

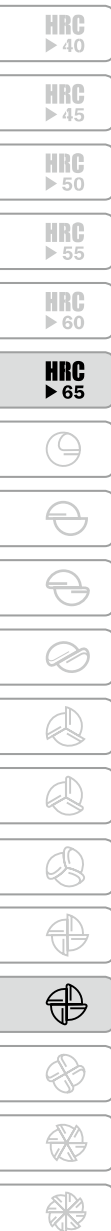
L3 L4  
L1≠L3≠L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 角           | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACO |
| 6            | 0.5           | 6            | 18               | 50          | 6              | 4      | P-SFUCRS060054     | .06        | .07    |
| 6            | 1             | 6            | 18               | 50          | 6              | 4      | P-SFUCRS060104     | .06        | .07    |
| 6            | 2             | 6            | 18               | 50          | 6              | 4      | P-SFUCRS060204     | .06        | .07    |
| 8            | 0.3           | 8            | 20               | 60          | 8              | 4      | P-SFUCRS080034     | .06        | .07    |
| 8            | 0.5           | 8            | 20               | 60          | 8              | 4      | P-SFUCRS080054     | .06        | .07    |
| 8            | 1             | 8            | 20               | 60          | 8              | 4      | P-SFUCRS080104     | .06        | .07    |
| 8            | 2             | 8            | 20               | 60          | 8              | 4      | P-SFUCRS080204     | .06        | .07    |
| 10           | 0.5           | 10           | 25               | 75          | 10             | 4      | P-SFUCRS100054     | .06        | .07    |
| 10           | 1             | 10           | 25               | 75          | 10             | 4      | P-SFUCRS100104     | .06        | .07    |
| 10           | 1.5           | 10           | 25               | 75          | 10             | 4      | P-SFUCRS100154     | .06        | .07    |
| 10           | 2             | 10           | 25               | 75          | 10             | 4      | P-SFUCRS100204     | .06        | .07    |
| 10           | 3             | 10           | 25               | 75          | 10             | 4      | P-SFUCRS100304     | .06        | .07    |
| 12           | 0.5           | 12           | 30               | 75          | 12             | 4      | P-SFUCRS120054     | .06        | .07    |
| 12           | 1             | 12           | 30               | 75          | 12             | 4      | P-SFUCRS120104     | .06        | .07    |
| 12           | 1.5           | 12           | 30               | 75          | 12             | 4      | P-SFUCRS120154     | .06        | .07    |
| 12           | 2             | 12           | 30               | 75          | 12             | 4      | P-SFUCRS120204     | .06        | .07    |
| 12           | 3             | 12           | 30               | 75          | 12             | 4      | P-SFUCRS120304     | .06        | .07    |



Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm



**200<sup>+</sup>** 切削條件表 **P395**  
Cutting Condition

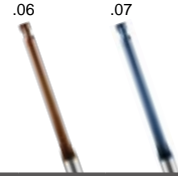
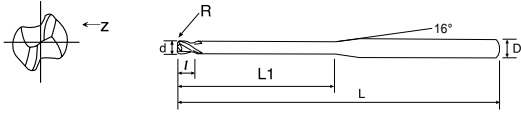
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |      |      |      |       | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|------|------|------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |      |      |      |       | MODE                | Coating 塗層 |        |
| d 刀徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°   | 1.5° | 2°   | 3°    | 型號                  | TISIN+     | P-nACO |
| 0.4          | 0.1           | 0.4          | 1                | 50          | 4              | 1.26                              | 1.44 | 1.59 | 1.72 | 1.96  | P-SFUCR004012(EL01) | .06        | .07    |
| 0.4          | 0.1           | 0.4          | 2                | 50          | 4              | 2.39                              | 2.62 | 2.80 | 2.96 | 3.24  | P-SFUCR004012(EL02) | .06        | .07    |
| 0.4          | 0.1           | 0.4          | 3                | 50          | 4              | 3.49                              | 3.75 | 3.96 | 4.14 | 4.32  | P-SFUCR004012(EL03) | .06        | .07    |
| 0.4          | 0.1           | 0.4          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR004012(EL04) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 1                | 50          | 4              | 1.26                              | 1.44 | 1.59 | 1.72 | 1.96  | P-SFUCR005012(EL01) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 2                | 50          | 4              | 2.39                              | 2.62 | 2.80 | 2.96 | 3.24  | P-SFUCR005012(EL02) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 3                | 50          | 4              | 3.49                              | 3.75 | 3.96 | 4.14 | 4.32  | P-SFUCR005012(EL03) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR005012(EL04) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 5                | 50          | 4              | 5.64                              | 5.96 | 6.21 | 6.43 | 6.92  | P-SFUCR005012(EL05) | .06        | .07    |
| 0.5          | 0.1           | 0.5          | 6                | 50          | 4              | 6.70                              | 7.05 | 7.32 | 7.57 | 8.14  | P-SFUCR005012(EL06) | .06        | .07    |
| 0.6          | 0.1           | 0.6          | 2                | 50          | 4              | 2.39                              | 2.62 | 2.80 | 2.96 | 3.24  | P-SFUCR006012(EL02) | .06        | .07    |
| 0.6          | 0.1           | 0.6          | 3                | 50          | 4              | 3.49                              | 3.75 | 3.96 | 4.14 | 4.32  | P-SFUCR006012(EL03) | .06        | .07    |
| 0.6          | 0.1           | 0.6          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR006012(EL04) | .06        | .07    |
| 0.6          | 0.1           | 0.6          | 6                | 50          | 4              | 6.70                              | 7.05 | 7.32 | 7.57 | 8.14  | P-SFUCR006012(EL06) | .06        | .07    |
| 0.6          | 0.1           | 0.6          | 8                | 50          | 4              | 8.81                              | 9.20 | 9.52 | 9.85 | 10.59 | P-SFUCR006012(EL08) | .06        | .07    |
| 0.7          | 0.1           | 0.7          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR007012(EL04) | .06        | .07    |
| 0.7          | 0.1           | 0.7          | 6                | 50          | 4              | 6.70                              | 7.05 | 7.32 | 7.57 | 8.14  | P-SFUCR007012(EL06) | .06        | .07    |
| 0.8          | 0.1           | 0.8          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR008012(EL04) | .06        | .07    |
| 0.8          | 0.1           | 0.8          | 6                | 50          | 4              | 6.70                              | 7.05 | 7.32 | 7.57 | 8.14  | P-SFUCR008012(EL06) | .06        | .07    |
| 0.8          | 0.2           | 0.8          | 4                | 50          | 4              | 4.57                              | 4.86 | 5.09 | 5.29 | 5.69  | P-SFUCR008022(EL04) | .06        | .07    |
| 0.8          | 0.2           | 0.8          | 6                | 50          | 4              | 6.70                              | 7.05 | 7.32 | 7.57 | 8.14  | P-SFUCR008022(EL06) | .06        | .07    |
| 1            | 0.1           | 1            | 2                | 50          | 4              | 2.55                              | 2.73 | 2.90 | 3.04 | 3.31  | P-SFUCR010012(EL02) | .06        | .07    |
| 1            | 0.1           | 1            | 4                | 50          | 4              | 4.69                              | 4.95 | 5.16 | 5.36 | 5.76  | P-SFUCR010012(EL04) | .06        | .07    |
| 1            | 0.1           | 1            | 6                | 50          | 4              | 6.80                              | 7.12 | 7.38 | 7.63 | 8.21  | P-SFUCR010012(EL06) | .06        | .07    |
| 1            | 0.1           | 1            | 8                | 50          | 4              | 8.90                              | 9.26 | 9.58 | 9.91 | 10.65 | P-SFUCR010012(EL08) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 P395  
Cutting Condition

## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀

200 PLUS

HRC 65

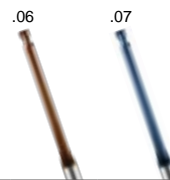
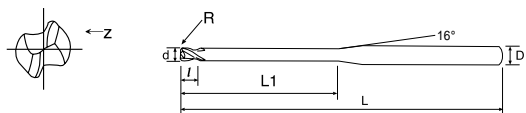
R

A B A+B

L3 L4 L1=L3 L2=L4

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |       |       |       |       | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |       | MODE                | Coating 塗層 |        |
| d 刃徑         | R 角           | 刃長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3°    | 型號                  | TISIN+     | P-nACO |
| 1            | 0.1           | 1            | 10               | 50          | 4              | 10.99                             | 11.39 | 11.78 | 12.19 | 13.10 | P-SFUCR010012(EL10) | .06        | .07    |
| 1            | 0.1           | 1            | 12               | 60          | 4              | 13.07                             | 13.52 | 13.98 | 14.47 | 15.55 | P-SFUCR010012(EL12) | .06        | .07    |
| 1            | 0.1           | 1            | 16               | 60          | 4              | 17.22                             | 17.78 | 18.38 | 19.02 | 20.44 | P-SFUCR010012(EL16) | .06        | .07    |
| 1            | 0.1           | 1            | 20               | 60          | 4              | 21.35                             | 22.04 | 22.78 | 23.57 | 25.34 | P-SFUCR010012(EL20) | .06        | .07    |
| 1            | 0.2           | 1            | 2                | 50          | 4              | 2.55                              | 2.73  | 2.90  | 3.04  | 3.31  | P-SFUCR010022(EL02) | .06        | .07    |
| 1            | 0.2           | 1            | 4                | 50          | 4              | 4.69                              | 4.95  | 5.16  | 5.36  | 5.76  | P-SFUCR010022(EL04) | .06        | .07    |
| 1            | 0.2           | 1            | 6                | 50          | 4              | 6.80                              | 7.12  | 7.38  | 7.63  | 8.21  | P-SFUCR010022(EL06) | .06        | .07    |
| 1            | 0.2           | 1            | 8                | 50          | 4              | 8.90                              | 9.26  | 9.58  | 9.91  | 10.65 | P-SFUCR010022(EL08) | .06        | .07    |
| 1            | 0.2           | 1            | 10               | 50          | 4              | 10.99                             | 11.39 | 11.78 | 12.19 | 13.10 | P-SFUCR010022(EL10) | .06        | .07    |
| 1            | 0.2           | 1            | 12               | 60          | 4              | 13.07                             | 13.52 | 13.98 | 14.47 | 15.55 | P-SFUCR010022(EL12) | .06        | .07    |
| 1            | 0.2           | 1            | 16               | 60          | 4              | 17.22                             | 17.78 | 18.38 | 19.02 | 20.44 | P-SFUCR010022(EL16) | .06        | .07    |
| 1            | 0.2           | 1            | 20               | 60          | 4              | 21.35                             | 22.04 | 22.78 | 23.57 | 25.34 | P-SFUCR010022(EL20) | .06        | .07    |
| 1            | 0.3           | 1            | 2                | 50          | 4              | 2.55                              | 2.73  | 2.90  | 3.04  | 3.31  | P-SFUCR010032(EL02) | .06        | .07    |
| 1            | 0.3           | 1            | 4                | 50          | 4              | 4.69                              | 4.95  | 5.16  | 5.36  | 5.76  | P-SFUCR010032(EL04) | .06        | .07    |
| 1            | 0.3           | 1            | 6                | 50          | 4              | 6.80                              | 7.12  | 7.38  | 7.63  | 8.21  | P-SFUCR010032(EL06) | .06        | .07    |
| 1            | 0.3           | 1            | 8                | 50          | 4              | 8.90                              | 9.26  | 9.58  | 9.91  | 10.65 | P-SFUCR010032(EL08) | .06        | .07    |
| 1            | 0.3           | 1            | 10               | 50          | 4              | 10.99                             | 11.39 | 11.78 | 12.19 | 13.10 | P-SFUCR010032(EL10) | .06        | .07    |
| 1            | 0.3           | 1            | 12               | 60          | 4              | 13.07                             | 13.52 | 13.98 | 14.47 | 15.55 | P-SFUCR010032(EL12) | .06        | .07    |
| 1            | 0.3           | 1            | 16               | 60          | 4              | 17.22                             | 17.78 | 18.38 | 19.02 | 20.44 | P-SFUCR010032(EL16) | .06        | .07    |
| 1            | 0.3           | 1            | 20               | 60          | 4              | 21.35                             | 22.04 | 22.78 | 23.57 | 25.34 | P-SFUCR010032(EL20) | .06        | .07    |
| 1.2          | 0.2           | 1.2          | 6                | 50          | 4              | 6.19                              | 6.40  | 6.61  | 6.84  | 7.36  | P-SFUCR012022(EL06) | .06        | .07    |
| 1.2          | 0.2           | 1.2          | 12               | 60          | 4              | 12.38                             | 12.78 | 13.21 | 13.67 | 14.70 | P-SFUCR012022(EL12) | .06        | .07    |
| 1.2          | 0.2           | 1.2          | 20               | 60          | 4              | 20.63                             | 21.30 | 22.02 | 22.78 | 24.49 | P-SFUCR012022(EL20) | .06        | .07    |
| 1.2          | 0.3           | 1.2          | 6                | 50          | 4              | 6.19                              | 6.40  | 6.61  | 6.84  | 7.36  | P-SFUCR012032(EL06) | .06        | .07    |
| 1.2          | 0.3           | 1.2          | 12               | 60          | 4              | 12.38                             | 12.78 | 13.21 | 13.67 | 14.70 | P-SFUCR012032(EL12) | .06        | .07    |
| 1.2          | 0.3           | 1.2          | 20               | 60          | 4              | 20.63                             | 21.30 | 22.02 | 22.78 | 24.49 | P-SFUCR012032(EL20) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P395**  
Cutting Condition

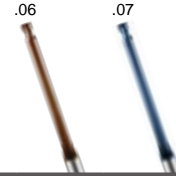
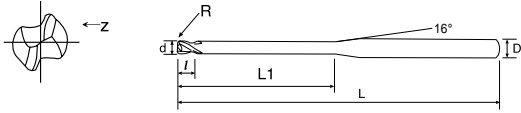
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                | Purchase Code 採購代碼                |       |       |       |       |                     |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |       | MODE                | Coating 塗層 |        |
| d 刀徑         | R 角           | 刀長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3°    | 型號                  | TiSiN+     | P-nACO |
| 1.5          | 0.2           | 1.5          | 4                | 50          | 4              | 4.13                              | 4.27  | 4.41  | 4.57  | 4.91  | P-SFUCR015022(EL04) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 6                | 50          | 4              | 6.19                              | 6.40  | 6.61  | 6.84  | 7.36  | P-SFUCR015022(EL06) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 8                | 50          | 4              | 8.26                              | 8.52  | 8.81  | 9.12  | 9.80  | P-SFUCR015022(EL08) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 10               | 50          | 4              | 10.32                             | 10.65 | 11.01 | 11.40 | 12.25 | P-SFUCR015022(EL10) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 12               | 60          | 4              | 12.38                             | 12.78 | 13.21 | 13.67 | 14.70 | P-SFUCR015022(EL12) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 16               | 60          | 4              | 16.51                             | 17.04 | 17.62 | 18.23 | 19.59 | P-SFUCR015022(EL16) | .06        | .07    |
| 1.5          | 0.2           | 1.5          | 20               | 60          | 4              | 20.63                             | 21.30 | 22.02 | 22.78 | *     | P-SFUCR015022(EL20) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 4                | 50          | 4              | 4.13                              | 4.27  | 4.41  | 4.57  | 4.91  | P-SFUCR015032(EL04) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 6                | 50          | 4              | 6.19                              | 6.40  | 6.61  | 6.84  | 7.36  | P-SFUCR015032(EL06) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 8                | 50          | 4              | 8.26                              | 8.52  | 8.81  | 9.12  | 9.80  | P-SFUCR015032(EL08) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 10               | 50          | 4              | 10.32                             | 10.65 | 11.01 | 11.40 | 12.25 | P-SFUCR015032(EL10) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 12               | 60          | 4              | 12.38                             | 12.78 | 13.21 | 13.67 | 14.70 | P-SFUCR015032(EL12) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 16               | 60          | 4              | 16.51                             | 17.04 | 17.62 | 18.23 | 19.59 | P-SFUCR015032(EL16) | .06        | .07    |
| 1.5          | 0.3           | 1.5          | 20               | 60          | 4              | 20.63                             | 21.30 | 22.02 | 22.78 | *     | P-SFUCR015032(EL20) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 4                | 50          | 4              | 4.13                              | 4.27  | 4.41  | 4.57  | 4.91  | P-SFUCR015052(EL04) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 6                | 50          | 4              | 6.19                              | 6.40  | 6.61  | 6.84  | 7.36  | P-SFUCR015052(EL06) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 8                | 50          | 4              | 8.26                              | 8.52  | 8.81  | 9.12  | 9.80  | P-SFUCR015052(EL08) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 10               | 50          | 4              | 10.32                             | 10.65 | 11.01 | 11.40 | 12.25 | P-SFUCR015052(EL10) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 12               | 60          | 4              | 12.38                             | 12.78 | 13.21 | 13.67 | 14.70 | P-SFUCR015052(EL12) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 16               | 60          | 4              | 16.51                             | 17.04 | 17.62 | 18.23 | 19.59 | P-SFUCR015052(EL16) | .06        | .07    |
| 1.5          | 0.5           | 1.5          | 20               | 60          | 4              | 20.63                             | 21.30 | 22.02 | 22.78 | *     | P-SFUCR015052(EL20) | .06        | .07    |
| 2            | 0.1           | 2            | 4                | 50          | 4              | 4.17                              | 4.30  | 4.45  | 4.60  | 4.95  | P-SFUCR020012(EL04) | .06        | .07    |
| 2            | 0.1           | 2            | 6                | 50          | 4              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR020012(EL06) | .06        | .07    |
| 2            | 0.1           | 2            | 8                | 50          | 4              | 8.29                              | 8.56  | 8.85  | 9.16  | 9.85  | P-SFUCR020012(EL08) | .06        | .07    |
| 2            | 0.1           | 2            | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR020012(EL10) | .06        | .07    |
| 2            | 0.1           | 2            | 12               | 60          | 4              | 12.42                             | 12.82 | 13.25 | 13.71 | 14.74 | P-SFUCR020012(EL12) | .06        | .07    |
| 2            | 0.1           | 2            | 16               | 60          | 4              | 16.54                             | 17.08 | 17.65 | 18.27 | *     | P-SFUCR020012(EL16) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P395**  
Cutting Condition

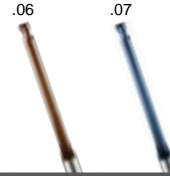
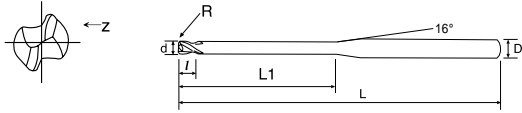
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |       |       |       |       | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |       | MODE                | Coating 塗層 |        |
| d 刃徑         | R 角           | 刃長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3°    | 型號                  | TISIN+     | P-nAcO |
| 2            | 0.1           | 2            | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | 22.82 | *     | P-SFUCR020012(EL20) | .06        | .07    |
| 2            | 0.1           | 2            | 26               | 75          | 4              | 26.86                             | 27.73 | 28.66 | *     | *     | P-SFUCR020012(EL26) | .06        | .07    |
| 2            | 0.2           | 2            | 4                | 50          | 4              | 4.17                              | 4.30  | 4.45  | 4.6   | 4.95  | P-SFUCR020022(EL04) | .06        | .07    |
| 2            | 0.2           | 2            | 6                | 50          | 4              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR020022(EL06) | .06        | .07    |
| 2            | 0.2           | 2            | 8                | 50          | 4              | 8.29                              | 8.56  | 8.85  | 9.16  | 9.85  | P-SFUCR020022(EL08) | .06        | .07    |
| 2            | 0.2           | 2            | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR020022(EL10) | .06        | .07    |
| 2            | 0.2           | 2            | 12               | 60          | 4              | 12.42                             | 12.82 | 13.25 | 13.71 | 14.74 | P-SFUCR020022(EL12) | .06        | .07    |
| 2            | 0.2           | 2            | 16               | 60          | 4              | 16.54                             | 17.08 | 17.65 | 18.27 | *     | P-SFUCR020022(EL16) | .06        | .07    |
| 2            | 0.2           | 2            | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | 22.82 | *     | P-SFUCR020022(EL20) | .06        | .07    |
| 2            | 0.2           | 2            | 26               | 75          | 4              | 26.86                             | 27.73 | 28.66 | *     | *     | P-SFUCR020022(EL26) | .06        | .07    |
| 2            | 0.3           | 2            | 4                | 50          | 4              | 4.17                              | 4.30  | 4.45  | 4.60  | 4.95  | P-SFUCR020032(EL04) | .06        | .07    |
| 2            | 0.3           | 2            | 6                | 50          | 4              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR020032(EL06) | .06        | .07    |
| 2            | 0.3           | 2            | 8                | 50          | 4              | 8.29                              | 8.56  | 8.85  | 9.16  | 9.85  | P-SFUCR020032(EL08) | .06        | .07    |
| 2            | 0.3           | 2            | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR020032(EL10) | .06        | .07    |
| 2            | 0.3           | 2            | 12               | 60          | 4              | 12.42                             | 12.82 | 13.25 | 13.71 | 14.74 | P-SFUCR020032(EL12) | .06        | .07    |
| 2            | 0.3           | 2            | 16               | 60          | 4              | 16.54                             | 17.08 | 17.65 | 18.27 | *     | P-SFUCR020032(EL16) | .06        | .07    |
| 2            | 0.3           | 2            | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | 22.82 | *     | P-SFUCR020032(EL20) | .06        | .07    |
| 2            | 0.3           | 2            | 26               | 75          | 4              | 26.86                             | 27.73 | 28.66 | *     | *     | P-SFUCR020032(EL26) | .06        | .07    |
| 2            | 0.5           | 2            | 4                | 50          | 4              | 4.17                              | 4.30  | 4.45  | 4.60  | 4.95  | P-SFUCR020052(EL04) | .06        | .07    |
| 2            | 0.5           | 2            | 6                | 50          | 4              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR020052(EL06) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nAcO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P395**  
Cutting Condition

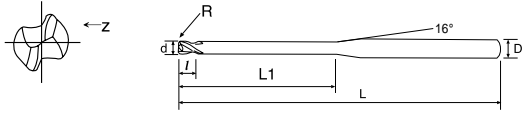
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |       |       |       |       | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |       | MODE                | Coating 塗層 |        |
| d 刀徑         | R 角           | 刃長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3°    | 型號                  | TiSiN+     | P-nACO |
| 2            | 0.5           | 2            | 8                | 50          | 4              | 8.29                              | 8.56  | 8.85  | 9.16  | 9.85  | P-SFUCR020052(EL08) | .06        | .07    |
| 2            | 0.5           | 2            | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR020052(EL10) | .06        | .07    |
| 2            | 0.5           | 2            | 12               | 60          | 4              | 12.42                             | 12.82 | 13.25 | 13.71 | 14.74 | P-SFUCR020052(EL12) | .06        | .07    |
| 2            | 0.5           | 2            | 16               | 60          | 4              | 16.54                             | 17.08 | 17.65 | 18.27 | *     | P-SFUCR020052(EL16) | .06        | .07    |
| 2            | 0.5           | 2            | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | 22.82 | *     | P-SFUCR020052(EL20) | .06        | .07    |
| 2            | 0.5           | 2            | 26               | 75          | 4              | 26.86                             | 27.73 | 28.66 | *     | *     | P-SFUCR020052(EL26) | .06        | .07    |
| 2.5          | 0.3           | 2.5          | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR025032(EL10) | .06        | .07    |
| 2.5          | 0.3           | 2.5          | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | *     | *     | P-SFUCR025032(EL20) | .06        | .07    |
| 2.5          | 0.3           | 2.5          | 30               | 75          | 4              | 30.98                             | 31.99 | *     | *     | *     | P-SFUCR025032(EL30) | .06        | .07    |
| 2.5          | 0.5           | 2.5          | 10               | 50          | 4              | 10.35                             | 10.69 | 11.05 | 11.44 | 12.29 | P-SFUCR025052(EL10) | .06        | .07    |
| 2.5          | 0.5           | 2.5          | 20               | 60          | 4              | 20.67                             | 21.34 | 22.06 | *     | *     | P-SFUCR025052(EL20) | .06        | .07    |
| 2.5          | 0.5           | 2.5          | 30               | 75          | 4              | 30.98                             | 31.99 | *     | *     | *     | P-SFUCR025052(EL30) | .06        | .07    |
| 3            | 0.1           | 3            | 6                | 60          | 6              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR030012(EL06) | .06        | .07    |
| 3            | 0.1           | 3            | 16               | 60          | 6              | 16.54                             | 17.08 | 17.65 | 18.26 | 19.63 | P-SFUCR030012(EL16) | .06        | .07    |
| 3            | 0.1           | 3            | 26               | 75          | 6              | 26.85                             | 27.72 | 28.66 | 29.65 | *     | P-SFUCR030012(EL26) | .06        | .07    |
| 3            | 0.1           | 3            | 36               | 75          | 6              | 37.17                             | 38.37 | 39.66 | 41.04 | *     | P-SFUCR030012(EL36) | .06        | .07    |
| 3            | 0.2           | 3            | 6                | 60          | 6              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR030022(EL06) | .06        | .07    |
| 3            | 0.2           | 3            | 16               | 60          | 6              | 16.54                             | 17.08 | 17.65 | 18.26 | 19.63 | P-SFUCR030022(EL16) | .06        | .07    |
| 3            | 0.2           | 3            | 26               | 75          | 6              | 26.85                             | 27.72 | 28.66 | 29.65 | *     | P-SFUCR030022(EL26) | .06        | .07    |
| 3            | 0.2           | 3            | 36               | 75          | 6              | 37.17                             | 38.37 | 39.66 | 41.04 | *     | P-SFUCR030022(EL36) | .06        | .07    |
| 3            | 0.3           | 3            | 6                | 60          | 6              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR030032(EL06) | .06        | .07    |
| 3            | 0.3           | 3            | 16               | 60          | 6              | 16.54                             | 17.08 | 17.65 | 18.26 | 19.63 | P-SFUCR030032(EL16) | .06        | .07    |
| 3            | 0.3           | 3            | 26               | 75          | 6              | 26.85                             | 27.72 | 28.66 | 29.65 | *     | P-SFUCR030032(EL26) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 P395  
Cutting Condition

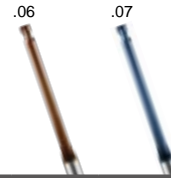
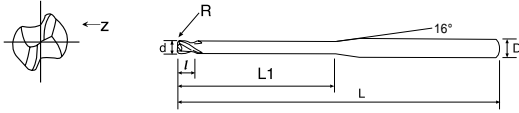
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |       |       |       |       | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|-------|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |       | MODE                | Coating 塗層 |        |
| d 刃徑         | R 角           | 刃長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3°    | 型號                  | TISIN+     | P-nACO |
| 3            | 0.3           | 3            | 36               | 75          | 6              | 37.17                             | 38.37 | 39.66 | 41.04 | *     | P-SFUCR030032(EL36) | .06        | .07    |
| 3            | 0.5           | 3            | 6                | 60          | 6              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR030052(EL06) | .06        | .07    |
| 3            | 0.5           | 3            | 16               | 60          | 6              | 16.54                             | 17.08 | 17.65 | 18.26 | 19.63 | P-SFUCR030052(EL16) | .06        | .07    |
| 3            | 0.5           | 3            | 26               | 75          | 6              | 26.85                             | 27.72 | 28.66 | 29.65 | *     | P-SFUCR030052(EL26) | .06        | .07    |
| 3            | 0.5           | 3            | 36               | 75          | 6              | 37.17                             | 38.37 | 39.66 | 41.04 | *     | P-SFUCR030052(EL36) | .06        | .07    |
| 3            | 1             | 3            | 6                | 60          | 6              | 6.23                              | 6.43  | 6.65  | 6.88  | 7.40  | P-SFUCR030102(EL06) | .06        | .07    |
| 3            | 1             | 3            | 16               | 60          | 6              | 16.54                             | 17.08 | 17.65 | 18.26 | 19.63 | P-SFUCR030102(EL16) | .06        | .07    |
| 3            | 1             | 3            | 26               | 75          | 6              | 26.85                             | 27.72 | 28.66 | 29.65 | *     | P-SFUCR030102(EL26) | .06        | .07    |
| 3            | 1             | 3            | 36               | 75          | 6              | 37.17                             | 38.37 | 39.66 | 41.04 | *     | P-SFUCR030102(EL36) | .06        | .07    |
| 4            | 0.1           | 4            | 8                | 60          | 6              | 8.47                              | 8.74  | 9.04  | 9.35  | 10.06 | P-SFUCR040012(EL08) | .06        | .07    |
| 4            | 0.1           | 4            | 20               | 60          | 6              | 20.84                             | 21.52 | 22.24 | 23.02 | *     | P-SFUCR040012(EL20) | .06        | .07    |
| 4            | 0.1           | 4            | 32               | 75          | 6              | 33.22                             | 34.30 | 35.45 | *     | *     | P-SFUCR040012(EL32) | .06        | .07    |
| 4            | 0.1           | 4            | 48               | 100         | 6              | 49.72                             | 51.34 | *     | *     | *     | P-SFUCR040012(EL48) | .06        | .07    |
| 4            | 0.3           | 4            | 8                | 60          | 6              | 8.47                              | 8.74  | 9.04  | 9.35  | 10.06 | P-SFUCR040032(EL08) | .06        | .07    |
| 4            | 0.3           | 4            | 20               | 60          | 6              | 20.84                             | 21.52 | 22.24 | 23.02 | *     | P-SFUCR040032(EL20) | .06        | .07    |
| 4            | 0.3           | 4            | 32               | 75          | 6              | 33.22                             | 34.30 | 35.45 | *     | *     | P-SFUCR040032(EL32) | .06        | .07    |
| 4            | 0.3           | 4            | 48               | 100         | 6              | 49.72                             | 51.34 | *     | *     | *     | P-SFUCR040032(EL48) | .06        | .07    |
| 4            | 0.5           | 4            | 8                | 60          | 6              | 8.47                              | 8.74  | 9.04  | 9.35  | 10.06 | P-SFUCR040052(EL08) | .06        | .07    |
| 4            | 0.5           | 4            | 20               | 60          | 6              | 20.84                             | 21.52 | 22.24 | 23.02 | *     | P-SFUCR040052(EL20) | .06        | .07    |
| 4            | 0.5           | 4            | 32               | 75          | 6              | 33.22                             | 34.30 | 35.45 | *     | *     | P-SFUCR040052(EL32) | .06        | .07    |
| 4            | 0.5           | 4            | 48               | 100         | 6              | 49.72                             | 51.34 | *     | *     | *     | P-SFUCR040052(EL48) | .06        | .07    |
| 4            | 1             | 4            | 8                | 60          | 6              | 8.47                              | 8.74  | 9.04  | 9.35  | 10.06 | P-SFUCR040102(EL08) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACO     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm

**200<sup>+</sup>** 切削條件表 **P395**  
Cutting Condition

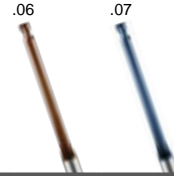
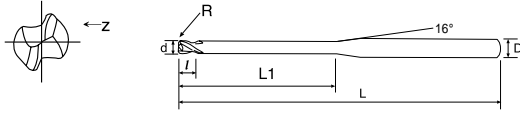
## Long Neck Type - Corner Radius - 2 flutes

### 2刃深溝長頸圓鼻立銑刀



● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |                                   |       |       |       |    | Purchase Code 採購代碼  |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|-----------------------------------|-------|-------|-------|----|---------------------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Effective Leng by Inclined Angles |       |       |       |    | MODE                | Coating 塗層 |        |
| d 刃徑         | R 角           | 刃長           | L1 有效長           | L 全長        | D 柄徑           | 0.5°                              | 1°    | 1.5°  | 2°    | 3° | 型號                  | TiSiN+     | P-nAco |
| 4            | 1             | 4            | 20               | 60          | 6              | 20.84                             | 21.52 | 22.24 | 23.06 | *  | P-SFUCR040102(EL20) | .06        | .07    |
| 4            | 1             | 4            | 32               | 75          | 6              | 33.22                             | 34.30 | 35.45 | *     | *  | P-SFUCR040102(EL32) | .06        | .07    |
| 4            | 1             | 4            | 48               | 100         | 6              | 49.72                             | 51.34 | *     | *     | *  | P-SFUCR040102(EL48) | .06        | .07    |
| 5            | 0.3           | 5            | 20               | 75          | 6              | 20.84                             | 21.52 | *     | *     | *  | P-SFUCR050032(EL20) | .06        | .07    |
| 5            | 0.3           | 5            | 40               | 100         | 6              | 41.47                             | *     | *     | *     | *  | P-SFUCR050032(EL40) | .06        | .07    |
| 5            | 0.5           | 5            | 20               | 75          | 6              | 20.84                             | 21.52 | *     | *     | *  | P-SFUCR050052(EL20) | .06        | .07    |
| 5            | 0.5           | 5            | 40               | 100         | 6              | 41.47                             | *     | *     | *     | *  | P-SFUCR050052(EL40) | .06        | .07    |
| 5            | 1             | 5            | 20               | 75          | 6              | 20.84                             | 21.52 | *     | *     | *  | P-SFUCR051002(EL20) | .06        | .07    |
| 5            | 1             | 5            | 40               | 100         | 6              | 41.47                             | *     | *     | *     | *  | P-SFUCR051002(EL40) | .06        | .07    |
| 6            | 0.1           | 6            | 12               | 60          | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060012(EL12) | .06        | .07    |
| 6            | 0.1           | 6            | 30               | 100         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060012(EL30) | .06        | .07    |
| 6            | 0.1           | 6            | 60               | 120         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060012(EL60) | .06        | .07    |
| 6            | 0.3           | 6            | 30               | 100         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060032(EL30) | .06        | .07    |
| 6            | 0.3           | 6            | 60               | 120         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060032(EL60) | .06        | .07    |
| 6            | 0.5           | 6            | 12               | 60          | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060052(EL12) | .06        | .07    |
| 6            | 0.5           | 6            | 30               | 100         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060052(EL30) | .06        | .07    |
| 6            | 0.5           | 6            | 60               | 120         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060052(EL60) | .06        | .07    |
| 6            | 1             | 6            | 12               | 60          | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060102(EL12) | .06        | .07    |
| 6            | 1             | 6            | 30               | 100         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060102(EL30) | .06        | .07    |
| 6            | 1             | 6            | 60               | 120         | 6              | *                                 | *     | *     | *     | *  | P-SFUCR060102(EL60) | .06        | .07    |

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |                     |                    |                           |                     |                    |
| P-nAco     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |                     |                    |                           |                     |                    |

Unit/單位: mm

# 200<sup>+</sup>

切削條件表 **P396**  
Cutting Condition

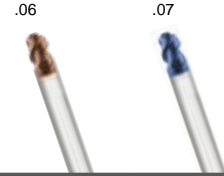
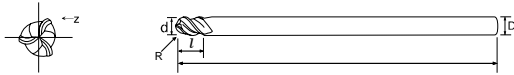
## Ball Nose Type - 3 different flutes

### 3刃不等分割球刀

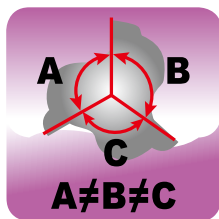


● Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |        |              |             |                |        | Purchase Code 採購代碼 |            |        |
|--------------|--------|--------------|-------------|----------------|--------|--------------------|------------|--------|
| Diameter     | Radius | Flute Length | Full Length | Shank Diameter | Flutes | MODE               | Coating 塗層 |        |
| d 刃徑         | R 值    | L 刃長         | L 全長        | D 柄徑           | Z 刃數   | 型號                 | TISIN+     | P-nACo |
| 1            | 0.5    | 1.5          | 60          | 6              | 3      | DAB0103            | .06        | .07    |
| 2            | 1      | 3            | 60          | 6              | 3      | DAB0203            | .06        | .07    |
| 3            | 1.5    | 4.5          | 75          | 6              | 3      | DAB0303            | .06        | .07    |
| 4            | 2      | 6            | 75          | 6              | 3      | DAB0403            | .06        | .07    |
| 5            | 2.5    | 7.5          | 75          | 6              | 3      | DAB0603            | .06        | .07    |
| 6            | 3      | 9            | 75          | 6              | 3      | DABM0603           | .06        | .07    |
| 6            | 3      | 9            | 100         | 6              | 3      | DABL0603           | .06        | .07    |
| 8            | 4      | 12           | 100         | 8              | 3      | DAB0803            | .06        | .07    |
| 8            | 4      | 12           | 120         | 8              | 3      | DABL0803           | .06        | .07    |
| 10           | 5      | 15           | 100         | 10             | 3      | DAB1003            | .06        | .07    |
| 10           | 5      | 15           | 130         | 10             | 3      | DABL1003           | .06        | .07    |
| 12           | 6      | 18           | 100         | 12             | 3      | DAB1203            | .06        | .07    |
| 12           | 6      | 18           | 150         | 12             | 3      | DABL1203           | .06        | .07    |
| 16           | 8      | 24           | 150         | 16             | 3      | DAB1603            | .06        | .07    |
| 20           | 10     | 30           | 150         | 20             | 3      | DAB2003            | .06        | .07    |
| 20           | 10     | 30           | 200         | 20             | 3      | DABL2003           | .06        | .07    |



1. Milling For All Hard Working Material  
適用各式難切削材
2. Unique Variable Shape, Super Vibration Resistance  
不等分割設計，降低切削的震動
3. Perfect Technology, Excellent Cutting Surface  
高精密刀具，切削表面更光滑平順
4. Less Working Distress, Longer Tool Life  
有效降低加工時間，刀具壽命更長。
5. Unbalance Flute Design For Fast Chip Remove  
特殊排削溝設計，排削更順暢

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 碳素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TISIN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm



**200<sup>+</sup>** 切削條件表 **P397**  
Cutting Condition

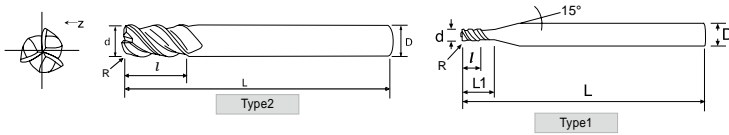
## Corner Radius Type - 3 flutes

### 3刃不等分割圓鼻刀

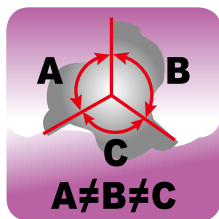


● Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| Dimension 規格 |               |              |                  |             |                |        |                                   |       |       |       | Purchase Code 採購代碼 |           |            |        |
|--------------|---------------|--------------|------------------|-------------|----------------|--------|-----------------------------------|-------|-------|-------|--------------------|-----------|------------|--------|
| Diameter     | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes | Effective Leng by Inclined Angles |       |       |       | Type               | MODE      | Coating 塗層 |        |
| d 刃徑         | R 角           | l 刃長         | L1有效長            | L 全長        | D 柄徑           | Z 刃數   | 0.5°                              | 1°    | 2°    | 3°    | 刀形                 | 型號        | TiSiN+     | P-nACo |
| 2            | 0.5           | 4            | 6                | 60          | 6              | 3      | 6.41                              | 6.77  | 7.39  | 7.89  | 1                  | DAC020053 | .06        | .07    |
| 3            | 0.8           | 6            | 9                | 75          | 6              | 3      | 9.46                              | 9.87  | 10.62 | 11.48 | 1                  | DAC030083 | .06        | .07    |
| 4            | 1             | 8            | 12               | 75          | 6              | 3      | 12.6                              | 13.09 | 14.07 | 15.21 | 1                  | DAC040103 | .06        | .07    |
| 5            | 1             | 10           | 15               | 75          | 6              | 3      | 15.72                             | 16.3  | -     | -     | 1                  | DAC050103 | .06        | .07    |
| 6            | 1.5           | 12           | -                | 75          | 6              | 3      | -                                 | -     | -     | -     | 2                  | DAC060153 | .06        | .07    |
| 8            | 2             | 16           | -                | 100         | 8              | 3      | -                                 | -     | -     | -     | 2                  | DAC080203 | .06        | .07    |
| 10           | 2             | 20           | -                | 100         | 10             | 3      | -                                 | -     | -     | -     | 2                  | DAC100203 | .06        | .07    |
| 12           | 2             | 24           | -                | 100         | 12             | 3      | -                                 | -     | -     | -     | 2                  | DAC120203 | .06        | .07    |
| 16           | 3             | 32           | -                | 150         | 16             | 3      | -                                 | -     | -     | -     | 2                  | DAC160303 | .06        | .07    |
| 20           | 3             | 40           | -                | 150         | 20             | 3      | -                                 | -     | -     | -     | 2                  | DAC200303 | .06        | .07    |



1. Milling For All Hard Working Material  
適用各式難切削材
2. Unique Variable Shape, Super Vibration Resistance  
不等分割設計, 降低切削的震動
3. Perfect Technology, Excellent Cutting Surface  
高精密刀具, 切削表面更光滑平順
4. Less Working Distress, Longer Tool Life  
有效降低加工時間, 刀具壽命更長.
5. Unbalance Flute Design For Fast Chip Remove  
特殊排屑溝設計, 排屑更順暢

Application 適用材質 :

★ Perfect 最推薦

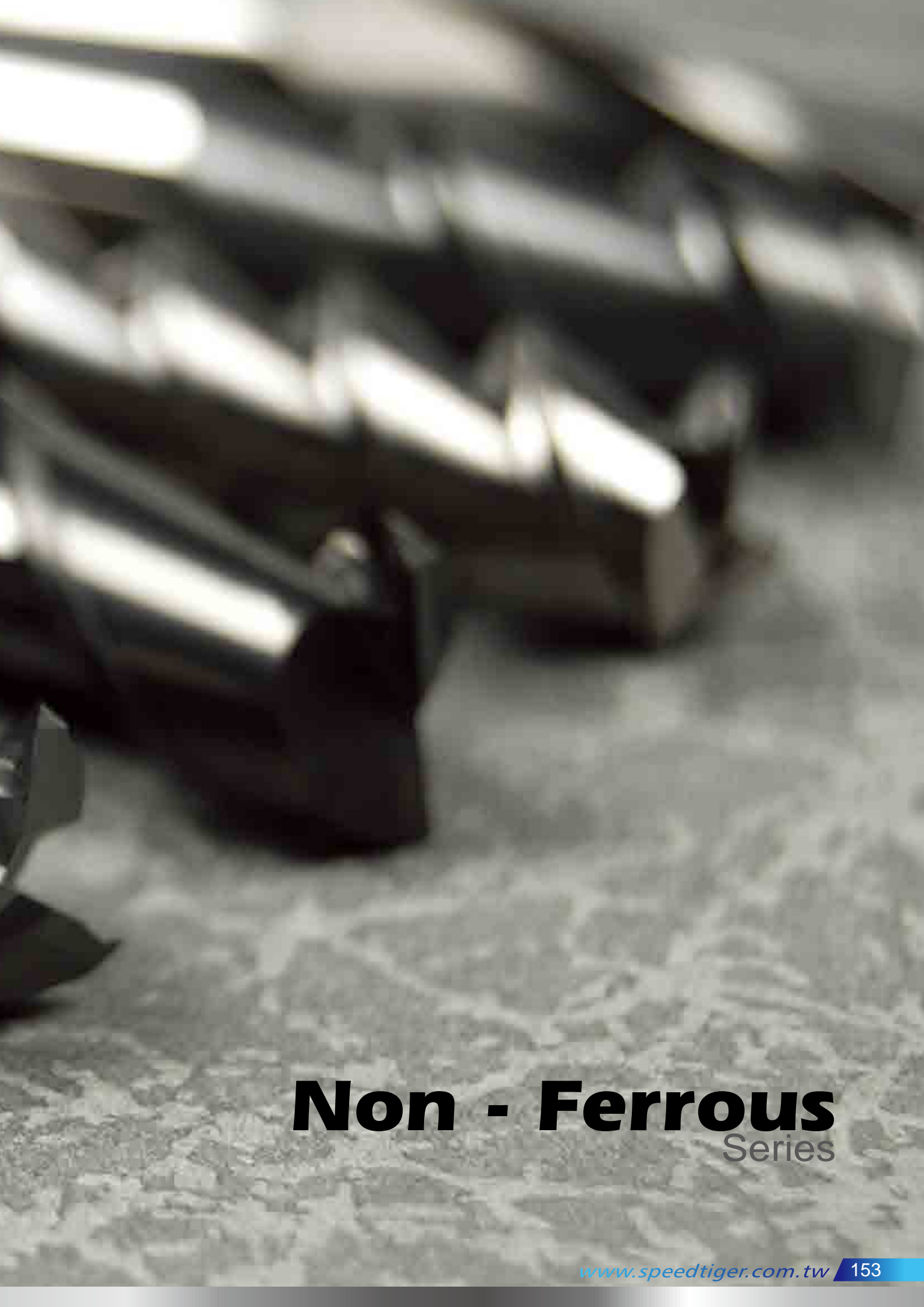
◎ Excellent 適合

○ Good 佳

| Coating 塗層 | Carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-harden steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel 不鏽鋼 | Titanium alloy 鈦合金 | Nickel/Inconel alloy 鎳基合金 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------|------------------------------------|----------------------|--------------------|--------|--------|--------|--|---------------------|--------------------|---------------------------|---------------------|--------------------|
|            |                                    | ~45HRC               | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                     |                    |                           |                     |                    |
| TiSiN+     | ○                                  | ○                    | ○                  | ◎      | ◎      | ◎      |  |                     |                    |                           |                     |                    |
| P-nACo     | ○                                  | ○                    | ○                  | ◎      | ◎      | ★      |  |                     |                    |                           |                     |                    |

Unit/單位: mm





# **Non - Ferrous** Series

切削條件表  
Cutting Condition  
**P398**

Square Type - For Wood & Plastic

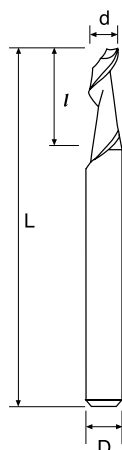
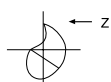
## ■ 塑膠、木工用立銑刀

600 Nano



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE   | Diameter      | Flute Length | Full Length | Shank Diameter | Flutes |
|--------|---------------|--------------|-------------|----------------|--------|
| 型號     | d 刃徑          | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AP0100 | 1             | 4            | 50          | 3              | 1      |
| AP0150 | 1.5           | 6            | 50          | 3              | 1      |
| AP0200 | 2             | 8            | 50          | 2              | 1      |
| AP0201 | 2             | 8            | 60          | 2              | 1      |
| AP0202 | 2             | 8            | 50          | 3              | 1      |
| AP0250 | 2.5           | 8            | 50          | 3              | 1      |
| AP0251 | 2.5           | 8            | 60          | 3              | 1      |
| AP0300 | 3             | 10           | 50          | 3              | 1      |
| AP0301 | 3             | 10           | 60          | 3              | 1      |
| AP0302 | 3             | 10           | 80          | 6              | 1      |
| AP0310 | 3.17 (1/8")   | 12.7         | 60          | 6.35           | 1      |
| AP0400 | 4             | 12           | 60          | 4              | 1      |
| AP0401 | 4             | 20           | 70          | 4              | 1      |
| AP0402 | 4             | 30           | 80          | 4              | 1      |
| AP0403 | 4             | 12           | 60          | 6              | 1      |
| AP0470 | 4.765 (3/16") | 15.9         | 70          | 6.35           | 1      |
| AP0500 | 5             | 16           | 70          | 5              | 1      |
| AP0501 | 5             | 30           | 80          | 5              | 1      |
| AP0600 | 6             | 16           | 60          | 6              | 1      |
| AP0601 | 6             | 25           | 75          | 6              | 1      |
| AP0602 | 6             | 30           | 75          | 6              | 1      |
| AP0604 | 6             | 38           | 100         | 6              | 1      |
| AP0630 | 6.35 (1/4")   | 15.8         | 70          | 6.35           | 1      |
| AP0800 | 8             | 22           | 75          | 8              | 1      |
| AP0801 | 8             | 38           | 100         | 8              | 1      |
| AP1000 | 10            | 30           | 80          | 10             | 1      |
| AP1200 | 12            | 30           | 100         | 12             | 1      |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 | plastic<br>塑膠 | Wood<br>木工 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|---------------|------------|
|  | -45HRC                  | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |               |            |
|  |                         |                       |        |        |        |                        |                        |                       | ○             | ◎          |

切削條件表  
Cutting Condition  
**P398**

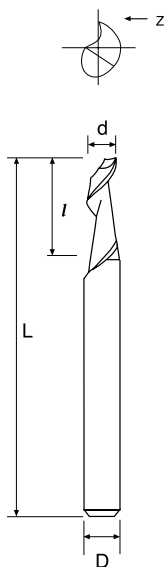
Square Type - For Wood & Plastic

## ■ 塑膠、木工用立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter      | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|---------------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑          | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AP0100 TB | 1             | 4            | 50          | 3              | 1      |
| AP0150 TB | 1.5           | 6            | 50          | 3              | 1      |
| AP0200 TB | 2             | 8            | 50          | 2              | 1      |
| AP0201 TB | 2             | 8            | 60          | 2              | 1      |
| AP0202 TB | 2             | 8            | 50          | 3              | 1      |
| AP0250 TB | 2.5           | 8            | 50          | 3              | 1      |
| AP0251 TB | 2.5           | 8            | 60          | 3              | 1      |
| AP0300 TB | 3             | 10           | 50          | 3              | 1      |
| AP0301 TB | 3             | 10           | 60          | 3              | 1      |
| AP0302 TB | 3             | 10           | 80          | 6              | 1      |
| AP0310 TB | 3.17 (1/8")   | 12.7         | 60          | 6.35           | 1      |
| AP0400 TB | 4             | 12           | 60          | 4              | 1      |
| AP0401 TB | 4             | 20           | 70          | 4              | 1      |
| AP0402 TB | 4             | 30           | 80          | 4              | 1      |
| AP0403 TB | 4             | 12           | 60          | 6              | 1      |
| AP0470 TB | 4.765 (3/16") | 15.9         | 70          | 6.35           | 1      |
| AP0500 TB | 5             | 16           | 70          | 5              | 1      |
| AP0501 TB | 5             | 30           | 80          | 5              | 1      |
| AP0600 TB | 6             | 16           | 60          | 6              | 1      |
| AP0601 TB | 6             | 25           | 75          | 6              | 1      |
| AP0602 TB | 6             | 30           | 75          | 6              | 1      |
| AP0604 TB | 6             | 38           | 100         | 6              | 1      |
| AP0630 TB | 6.35 (1/4")   | 15.8         | 70          | 6.35           | 1      |
| AP0800 TB | 8             | 22           | 75          | 8              | 1      |
| AP0801 TB | 8             | 38           | 100         | 8              | 1      |
| AP1000 TB | 10            | 30           | 80          | 10             | 1      |
| AP1200 TB | 12            | 30           | 100         | 12             | 1      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 | plastic<br>塑膠 | Wood<br>木工 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|---------------|------------|
|  | -45HRC                  | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |               |            |
|  |                         |                       |        |        |        |                        |                        |                       | ○             | ◎          |

Unit/單位: mm

## Square Type - For Copper & Aluminum Alloy - 2 flutes

### ■ 2刃銅鋁合金專用立銑刀

600  
Nano



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm

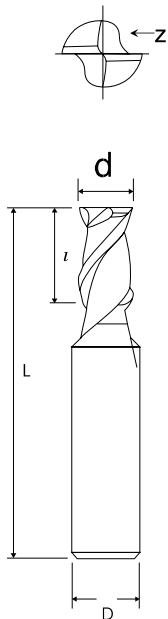
切 削  
條件表 **P399**  
Cutting Condition



| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AE50302 | 3        | 9            | 50          | 6              | 2      |
| AE50402 | 4        | 12           | 50          | 6              | 2      |
| AE50502 | 5        | 15           | 50          | 6              | 2      |
| AE50602 | 6        | 18           | 50          | 6              | 2      |
| AE50802 | 8        | 20           | 60          | 8              | 2      |
| AE51002 | 10       | 30           | 75          | 10             | 2      |
| AE51202 | 12       | 32           | 75          | 12             | 2      |
| AE51602 | 16       | 45           | 100         | 16             | 2      |
| AE52002 | 20       | 45           | 100         | 20             | 2      |

切 削  
條件表 **P400-401**  
Cutting Condition

### Long flute - 長刃



| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AEL50302 | 3        | 12           | 60          | 6              | 2      |
| AEL50402 | 4        | 16           | 60          | 6              | 2      |
| AEL50502 | 5        | 20           | 60          | 6              | 2      |
| AEL50602 | 6        | 25           | 75          | 6              | 2      |
| AEL50802 | 8        | 32           | 75          | 8              | 2      |
| AEL51002 | 10       | 45           | 100         | 10             | 2      |
| AEL51202 | 12       | 45           | 100         | 12             | 2      |
| AEL51602 | 16       | 65           | 150         | 16             | 2      |
| AEL52002 | 20       | 75           | 150         | 20             | 2      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

## Square Type - For Copper & Aluminum Alloy Long flute - 2 flutes

### ■ 2刃長刃銅鋁合金專用立銑刀

600  
Nano

55°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



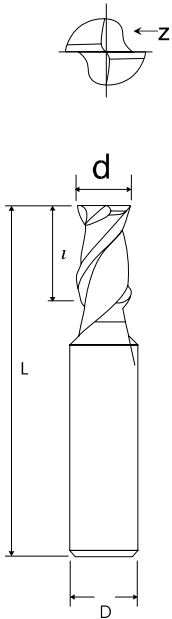
切削  
條件表 **P399**  
Cutting Condition

| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AE50302 TB | 3        | 9            | 50          | 6              | 2      |
| AE50402 TB | 4        | 12           | 50          | 6              | 2      |
| AE50502 TB | 5        | 15           | 50          | 6              | 2      |
| AE50602 TB | 6        | 18           | 50          | 6              | 2      |
| AE50802 TB | 8        | 20           | 60          | 8              | 2      |
| AE51002 TB | 10       | 30           | 75          | 10             | 2      |
| AE51202 TB | 12       | 32           | 75          | 12             | 2      |
| AE51602 TB | 16       | 45           | 100         | 16             | 2      |
| AE52002 TB | 20       | 45           | 100         | 20             | 2      |

切削  
條件表 **P400-401**  
Cutting Condition

### Long flute - 長刃

| MODE        | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|--------------|-------------|----------------|--------|
| 型號          | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AEL50302 TB | 3        | 12           | 60          | 6              | 2      |
| AEL50402 TB | 4        | 16           | 60          | 6              | 2      |
| AEL50502 TB | 5        | 20           | 60          | 6              | 2      |
| AEL50602 TB | 6        | 25           | 75          | 6              | 2      |
| AEL50802 TB | 8        | 32           | 75          | 8              | 2      |
| AEL51002 TB | 10       | 45           | 100         | 10             | 2      |
| AEL51202 TB | 12       | 45           | 100         | 12             | 2      |
| AEL51602 TB | 16       | 65           | 150         | 16             | 2      |
| AEL52002 TB | 20       | 75           | 150         | 20             | 2      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

600  
Nano



## Square Type - For Copper & Aluminum Alloy - 3 flutes

### ■ 3刃銅鋁合金專用立銑刀

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



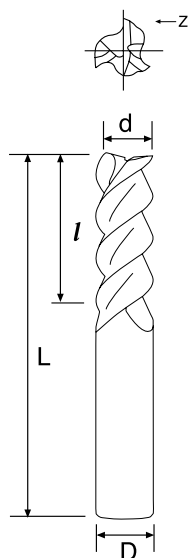
切 削  
條件表 **P402**  
Cutting Condition

| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AE50303 | 3        | 9            | 50          | 6              | 3      |
| AE50403 | 4        | 12           | 50          | 6              | 3      |
| AE50503 | 5        | 15           | 50          | 6              | 3      |
| AE50603 | 6        | 18           | 50          | 6              | 3      |
| AE50803 | 8        | 20           | 60          | 8              | 3      |
| AE51003 | 10       | 30           | 75          | 10             | 3      |
| AE51203 | 12       | 32           | 75          | 12             | 3      |
| AE51603 | 16       | 45           | 100         | 16             | 3      |
| AE52003 | 20       | 45           | 100         | 20             | 3      |

切 削  
條件表 **P403**  
Cutting Condition

### Long Flute - 長刃

| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AEL50303 | 3        | 12           | 60          | 6              | 3      |
| AEL50403 | 4        | 16           | 60          | 6              | 3      |
| AEL50503 | 5        | 20           | 60          | 6              | 3      |
| AEL50603 | 6        | 25           | 75          | 6              | 3      |
| AEL50803 | 8        | 32           | 75          | 8              | 3      |
| AEL51003 | 10       | 45           | 100         | 10             | 3      |
| AEL51203 | 12       | 45           | 100         | 12             | 3      |
| AEL51603 | 16       | 65           | 150         | 16             | 3      |
| AEL52003 | 20       | 75           | 150         | 20             | 3      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm



## Square Type - For Copper & Aluminum Alloy - 3 flutes

### ■ 3刃銅鋁合金專用立銑刀

600 Nano

55°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



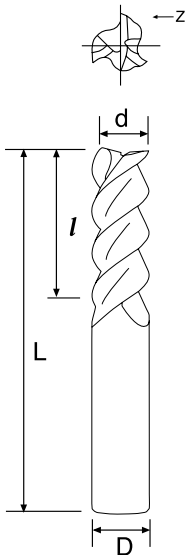
切削條件表 **P402**  
Cutting Condition

| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AE50303 TB | 3        | 9            | 50          | 6              | 3      |
| AE50403 TB | 4        | 12           | 50          | 6              | 3      |
| AE50503 TB | 5        | 15           | 50          | 6              | 3      |
| AE50603 TB | 6        | 18           | 50          | 6              | 3      |
| AE50803 TB | 8        | 20           | 60          | 8              | 3      |
| AE51003 TB | 10       | 30           | 75          | 10             | 3      |
| AE51203 TB | 12       | 32           | 75          | 12             | 3      |
| AE51603 TB | 16       | 45           | 100         | 16             | 3      |
| AE52003 TB | 20       | 45           | 100         | 20             | 3      |

切削條件表 **P403**  
Cutting Condition

### Long Flute - 長刃

| MODE        | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|--------------|-------------|----------------|--------|
| 型號          | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AEL50303 TB | 3        | 12           | 60          | 6              | 3      |
| AEL50403 TB | 4        | 16           | 60          | 6              | 3      |
| AEL50503 TB | 5        | 20           | 60          | 6              | 3      |
| AEL50603 TB | 6        | 25           | 75          | 6              | 3      |
| AEL50803 TB | 8        | 32           | 75          | 8              | 3      |
| AEL51003 TB | 10       | 45           | 100         | 10             | 3      |
| AEL51203 TB | 12       | 45           | 100         | 12             | 3      |
| AEL51603 TB | 16       | 65           | 150         | 16             | 3      |
| AEL52003 TB | 20       | 75           | 150         | 20             | 3      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 |        |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |        |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P399**

### Specular Square Type - For Aluminum - 2 flutes

## 2刃全鏡面鋁用立銑刀

600  
Nano

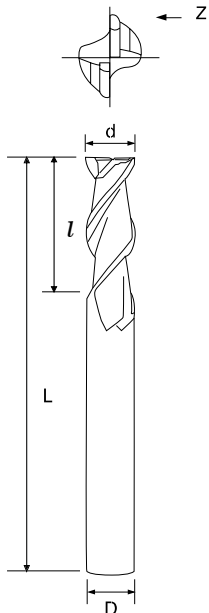


● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AET0052 | 0.5      | 1.5          | 50          | 4              | 2      |
| AET0062 | 0.6      | 1.5          | 50          | 4              | 2      |
| AET0082 | 0.8      | 2            | 50          | 4              | 2      |
| AET0102 | 1        | 3            | 50          | 6              | 2      |
| AET0122 | 1.2      | 4            | 50          | 6              | 2      |
| AET0152 | 1.5      | 4            | 50          | 6              | 2      |
| AET0182 | 1.8      | 5            | 50          | 6              | 2      |
| AET0202 | 2        | 6            | 50          | 6              | 2      |
| AET0302 | 3        | 8            | 50          | 6              | 2      |
| AET0402 | 4        | 10           | 50          | 6              | 2      |
| AET0502 | 5        | 13           | 50          | 6              | 2      |
| AET0602 | 6        | 15           | 50          | 6              | 2      |
| AET0802 | 8        | 20           | 60          | 8              | 2      |
| AET1002 | 10       | 25           | 75          | 10             | 2      |
| AET1202 | 12       | 30           | 75          | 12             | 2      |
| AET1602 | 16       | 42           | 100         | 16             | 2      |
| AET2002 | 20       | 52           | 100         | 20             | 2      |
| AET2502 | 25       | 62           | 125         | 25             | 2      |



- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼,合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金,銅 | Aluminum alloy<br>鋁合金 |
|---|---------------------------|-----------------------|--------|--------|--------|------------------------|-----------------------|-----------------------|
|   | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                       |                       |
|   |                           |                       |        |        |        |                        | ○                     | ◎                     |

Unit/單位: mm

切削條件表 **P399**  
Cutting Condition

### Specular Square Type - For Aluminum - 2 flutes

## ■ 2刃全鏡面鋁用立銑刀

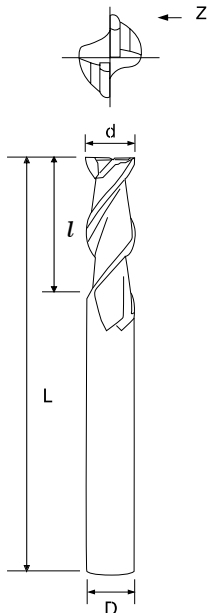
600  
Nano

45°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AET0052 TB | 0.5      | 1.5          | 50          | 4              | 2      |
| AET0062 TB | 0.6      | 1.5          | 50          | 4              | 2      |
| AET0082 TB | 0.8      | 2            | 50          | 4              | 2      |
| AET0102 TB | 1        | 3            | 50          | 6              | 2      |
| AET0122 TB | 1.2      | 4            | 50          | 6              | 2      |
| AET0152 TB | 1.5      | 4            | 50          | 6              | 2      |
| AET0182 TB | 1.8      | 5            | 50          | 6              | 2      |
| AET0202 TB | 2        | 6            | 50          | 6              | 2      |
| AET0302 TB | 3        | 8            | 50          | 6              | 2      |
| AET0402 TB | 4        | 10           | 50          | 6              | 2      |
| AET0502 TB | 5        | 13           | 50          | 6              | 2      |
| AET0602 TB | 6        | 15           | 50          | 6              | 2      |
| AET0802 TB | 8        | 20           | 60          | 8              | 2      |
| AET1002 TB | 10       | 25           | 75          | 10             | 2      |
| AET1202 TB | 12       | 30           | 75          | 12             | 2      |
| AET1602 TB | 16       | 42           | 100         | 16             | 2      |
| AET2002 TB | 20       | 52           | 100         | 20             | 2      |
| AET2502 TB | 25       | 62           | 125         | 25             | 2      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition  
**P402**

### Specular Square Type - For Aluminum - 3 flutes

## 3刃全鏡面鋁用立銑刀

600  
Nano

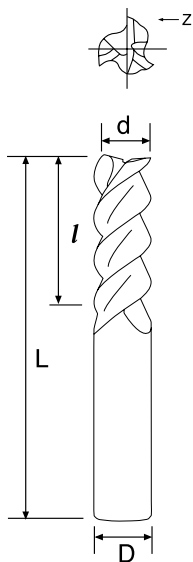


● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AET0103 | 1        | 3            | 50          | 4              | 3      |
| AET0123 | 1.2      | 4            | 50          | 4              | 3      |
| AET0153 | 1.5      | 4            | 50          | 4              | 3      |
| AET0183 | 1.8      | 5            | 50          | 4              | 3      |
| AET0203 | 2        | 6            | 50          | 4              | 3      |
| AET0303 | 3        | 8            | 50          | 6              | 3      |
| AET0403 | 4        | 10           | 50          | 6              | 3      |
| AET0503 | 5        | 13           | 50          | 6              | 3      |
| AET0603 | 6        | 15           | 50          | 6              | 3      |
| AET0803 | 8        | 20           | 60          | 8              | 3      |
| AET1003 | 10       | 25           | 75          | 10             | 3      |
| AET1203 | 12       | 30           | 75          | 12             | 3      |
| AET1603 | 16       | 42           | 100         | 16             | 3      |
| AET2003 | 20       | 52           | 100         | 20             | 3      |
| AET2503 | 25       | 62           | 125         | 25             | 3      |



HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P402**

### Specular Square Type - For Aluminum - 3 flutes

## 3刃全鏡面鋁用立銑刀

600 Nano

45°

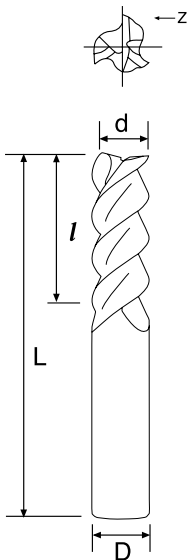
TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AET0103 TB | 1        | 3            | 50          | 4              | 3      |
| AET0123 TB | 1.2      | 4            | 50          | 4              | 3      |
| AET0153 TB | 1.5      | 4            | 50          | 4              | 3      |
| AET0183 TB | 1.8      | 5            | 50          | 4              | 3      |
| AET0203 TB | 2        | 6            | 50          | 4              | 3      |
| AET0303 TB | 3        | 8            | 50          | 6              | 3      |
| AET0403 TB | 4        | 10           | 50          | 6              | 3      |
| AET0503 TB | 5        | 13           | 50          | 6              | 3      |
| AET0603 TB | 6        | 15           | 50          | 6              | 3      |
| AET0803 TB | 8        | 20           | 60          | 8              | 3      |
| AET1003 TB | 10       | 25           | 75          | 10             | 3      |
| AET1203 TB | 12       | 30           | 75          | 12             | 3      |
| AET1603 TB | 16       | 42           | 100         | 16             | 3      |
| AET2003 TB | 20       | 52           | 100         | 20             | 3      |
| AET2503 TB | 25       | 62           | 125         | 25             | 3      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm



切削條件表  
**P400-401**  
 Cutting Condition

### Specular Square Type - Long Flute - For Aluminum - 2 flutes

## ■ 2刃長刃全鏡面鋁用立銑刀

600  
Nano

45°

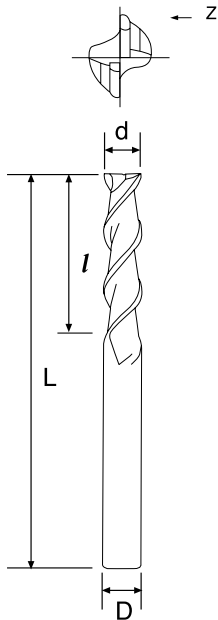
TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|--------------|-------------|----------------|--------|
| 型號          | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ALET0602 TB | 6        | 30           | 75          | 6              | 2      |
| ALET0802 TB | 8        | 40           | 100         | 8              | 2      |
| ALET1002 TB | 10       | 42           | 100         | 10             | 2      |
| ALET1202 TB | 12       | 52           | 100         | 12             | 2      |
| ALET1602 TB | 16       | 72           | 150         | 16             | 2      |
| ALET2002 TB | 20       | 92           | 150         | 20             | 2      |
| ALET2502 TB | 25       | 112          | 175         | 25             | 2      |



- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- ⊕
- ⊖
- ⊗
- ⊙
- ⊚
- ⊛
- ⊜
- ⊝
- ⊞
- ⊟
- ⊠
- ⊡
- ⊢
- ⊣
- ⊤
- ⊥
- ⊦
- ⊧
- ⊨
- ⊩
- ⊪
- ⊫
- ⊬
- ⊭
- ⊮
- ⊯
- ⊰
- ⊱
- ⊲
- ⊳
- ⊴
- ⊵
- ⊶
- ⊷
- ⊸
- ⊹
- ⊺
- ⊻
- ⊼
- ⊽
- ⊾
- ⊿

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P403**

Specular Square Type - Long Flutes & Shank -  
For Aluminum - 3 flutes

600  
Nano

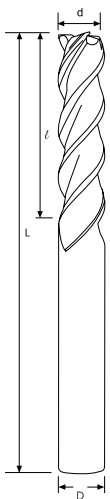
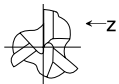
45°

TB

## 3刃全鏡面長柄長刃鋁用立銑刀

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Flute Length | Shank Diameter | Full Length | Flutes |
|-------------|----------|--------------|----------------|-------------|--------|
| 型號          | d 刃徑     | ℓ 刃長         | D 柄徑           | L 全長        | Z 刃數   |
| ALET0603 TB | 6        | 30           | 6              | 75          | 3      |
| ALET0803 TB | 8        | 40           | 8              | 100         | 3      |
| ALET1003 TB | 10       | 42           | 10             | 100         | 3      |
| ALET1203 TB | 12       | 52           | 12             | 100         | 3      |
| ALET1603 TB | 16       | 72           | 16             | 150         | 3      |
| ALET2003 TB | 20       | 92           | 20             | 150         | 3      |
| ALET2503 TB | 25       | 112          | 25             | 175         | 3      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P404**

### Roughing Type - For Aluminum - 3 flutes

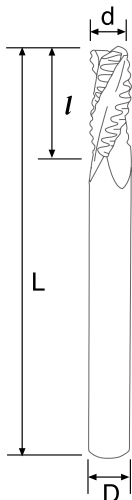
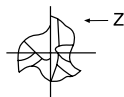
## 3刃鋁用粗銑刀

600  
Nano



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ANT0403 | 4        | 8            | 50          | 6              | 3      |
| ANT0503 | 5        | 13           | 50          | 6              | 3      |
| ANT0603 | 6        | 15           | 50          | 6              | 3      |
| ANT0653 | 6.5      | 16           | 60          | 8              | 3      |
| ANT0703 | 7        | 16           | 60          | 8              | 3      |
| ANT0753 | 7.5      | 20           | 60          | 8              | 3      |
| ANT0803 | 8        | 20           | 60          | 8              | 3      |
| ANT0853 | 8.5      | 20           | 75          | 10             | 3      |
| ANT0903 | 9        | 20           | 75          | 10             | 3      |
| ANT0953 | 9.5      | 22           | 75          | 10             | 3      |
| ANT1003 | 10       | 25           | 75          | 10             | 3      |
| ANT1103 | 11       | 30           | 75          | 12             | 3      |
| ANT1203 | 12       | 30           | 75          | 12             | 3      |
| ANT1303 | 13       | 30           | 75          | 14             | 3      |
| ANT1403 | 14       | 32           | 75          | 16             | 3      |
| ANT1503 | 15       | 32           | 75          | 16             | 3      |
| ANT1603 | 16       | 35           | 100         | 16             | 3      |
| ANT1703 | 17       | 35           | 100         | 20             | 3      |
| ANT1803 | 18       | 35           | 100         | 20             | 3      |
| ANT2003 | 20       | 45           | 100         | 20             | 3      |
| ANT2503 | 25       | 50           | 105         | 25             | 3      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm



切削條件表  
**P404**  
Cutting Condition

### Roughing Type - For Aluminum - 3 flutes

## 3刃鋁用粗銑刀

600  
Nano

45°

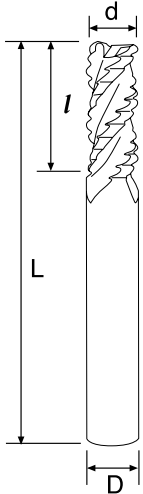
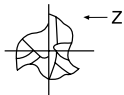
TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ANT0403 TB | 4        | 8            | 50          | 6              | 3      |
| ANT0503 TB | 5        | 13           | 50          | 6              | 3      |
| ANT0603 TB | 6        | 15           | 50          | 6              | 3      |
| ANT0653 TB | 6.5      | 16           | 60          | 8              | 3      |
| ANT0703 TB | 7        | 16           | 60          | 8              | 3      |
| ANT0753 TB | 7.5      | 20           | 60          | 8              | 3      |
| ANT0803 TB | 8        | 20           | 60          | 8              | 3      |
| ANT0853 TB | 8.5      | 20           | 75          | 10             | 3      |
| ANT0903 TB | 9        | 20           | 75          | 10             | 3      |
| ANT0953 TB | 9.5      | 22           | 75          | 10             | 3      |
| ANT1003 TB | 10       | 25           | 75          | 10             | 3      |
| ANT1103 TB | 11       | 30           | 75          | 12             | 3      |
| ANT1203 TB | 12       | 30           | 75          | 12             | 3      |
| ANT1303 TB | 13       | 30           | 75          | 14             | 3      |
| ANT1403 TB | 14       | 32           | 75          | 16             | 3      |
| ANT1503 TB | 15       | 32           | 75          | 16             | 3      |
| ANT1603 TB | 16       | 35           | 100         | 16             | 3      |
| ANT1803 TB | 18       | 35           | 100         | 20             | 3      |
| ANT2003 TB | 20       | 45           | 100         | 20             | 3      |
| ANT2503 TB | 25       | 50           | 105         | 25             | 3      |



• High efficient • Excellent chip removal • Low vibration  
• 高能率加工 • 切削排出性優良 • 加工時振動少

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切 削  
條件表  
Cutting Condition  
**P405**

### Square Type - For Copper - 2 flutes

## ■ 2刃銅合金專用立銑刀

600  
Nano

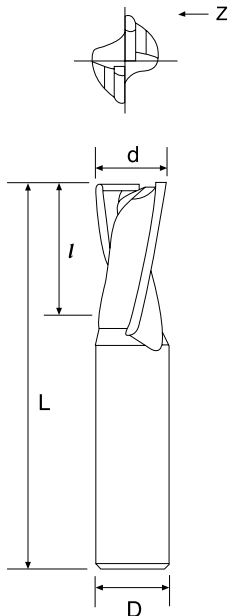


● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE   | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|--------|----------|--------------|-------------|----------------|--------|
| 型號     | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| CE0102 | 1.0      | 3            | 50          | 4              | 2      |
| CE0152 | 1.5      | 4            | 50          | 4              | 2      |
| CE0202 | 2.0      | 6            | 50          | 4              | 2      |
| CE0302 | 3.0      | 9            | 50          | 6              | 2      |
| CE0402 | 4.0      | 12           | 50          | 6              | 2      |
| CE0502 | 5.0      | 15           | 50          | 6              | 2      |
| CE0602 | 6.0      | 15           | 50          | 6              | 2      |
| CE0802 | 8.0      | 20           | 60          | 8              | 2      |
| CE1002 | 10.0     | 30           | 75          | 10             | 2      |
| CE1202 | 12.0     | 32           | 75          | 12             | 2      |
| CE1602 | 16.0     | 45           | 100         | 16             | 2      |
| CE2002 | 20.0     | 45           | 100         | 20             | 2      |



- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        | ◎                      | ○                      |                       |

Unit/單位: mm

切削條件表 **P405**  
Cutting Condition

### Square Type - For Copper - 2 flutes

## ■ 2刃銅合金專用立銑刀

600 Nano

25°

TB

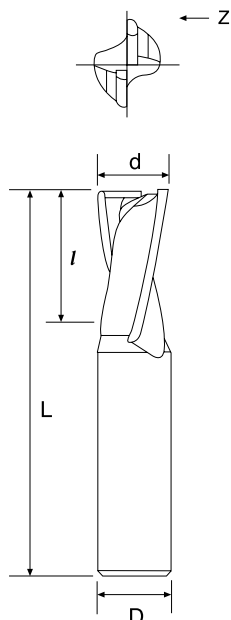
● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| CE0102 TB | 1        | 3            | 50          | 4              | 2      |
| CE0152 TB | 1.5      | 4            | 50          | 4              | 2      |
| CE0202 TB | 2        | 6            | 50          | 4              | 2      |
| CE0302 TB | 3        | 9            | 50          | 6              | 2      |
| CE0402 TB | 4        | 12           | 50          | 6              | 2      |
| CE0502 TB | 5        | 15           | 50          | 6              | 2      |
| CE0602 TB | 6        | 15           | 50          | 6              | 2      |
| CE0802 TB | 8        | 20           | 60          | 8              | 2      |
| CE1002 TB | 10       | 30           | 75          | 10             | 2      |
| CE1202 TB | 12       | 32           | 75          | 12             | 2      |
| CE1602 TB | 16       | 45           | 100         | 16             | 2      |
| CE2002 TB | 20       | 45           | 100         | 20             | 2      |

- 亦適用於鋁合金 Also suitable for Aluminum
- 容許公差 Tolerance for Dia : 0 ~ -0.03mm



HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        |                        | ◎                      | ◎                     |

Unit/單位: mm

切削條件表  
Cutting Condition

**P406**

### Square Type - Long Neck - For Copper - 2 flutes

## 2刃銅合金深溝頸立銑刀

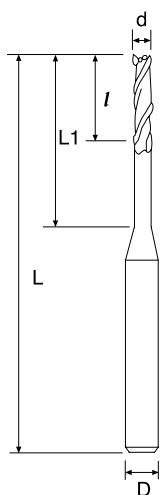
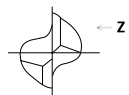
600 Nano

25°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Efficient Length | Full Length | Shank Diameter | Neck Diameter | Flutes |
|------------|----------|--------------|------------------|-------------|----------------|---------------|--------|
| 型號         | d 刃徑     | ℓ 刃長         | L1 有效長           | L 全長        | D 柄徑           | 頸徑            | Z 刃數   |
| CEL1004 TB | 1        | 2            | 4                | 50          | 4              | 0.95          | 2      |
| CEL1006 TB | 1        | 2            | 6                | 50          | 4              | 0.95          | 2      |
| CEL1010 TB | 1        | 2            | 10               | 50          | 4              | 0.95          | 2      |
| CEL1012 TB | 1        | 2            | 12               | 50          | 4              | 0.95          | 2      |
| CEL1016 TB | 1        | 2            | 16               | 50          | 4              | 0.95          | 2      |
| CEL1506 TB | 1.5      | 3            | 6                | 50          | 4              | 1.45          | 2      |
| CEL1510 TB | 1.5      | 3            | 10               | 50          | 4              | 1.45          | 2      |
| CEL1512 TB | 1.5      | 3            | 12               | 50          | 4              | 1.45          | 2      |
| CEL1516 TB | 1.5      | 3            | 16               | 50          | 4              | 1.45          | 2      |
| CEL2008 TB | 2        | 4            | 8                | 50          | 4              | 1.92          | 2      |
| CEL2012 TB | 2        | 4            | 12               | 50          | 4              | 1.92          | 2      |
| CEL2014 TB | 2        | 4            | 14               | 50          | 4              | 1.92          | 2      |
| CEL2020 TB | 2        | 4            | 20               | 50          | 4              | 1.92          | 2      |
| CEL3012 TB | 3        | 6            | 12               | 50          | 6              | 2.9           | 2      |
| CEL3016 TB | 3        | 6            | 16               | 50          | 6              | 2.9           | 2      |
| CEL3020 TB | 3        | 6            | 20               | 60          | 6              | 2.9           | 2      |
| CEL3025 TB | 3        | 6            | 25               | 75          | 6              | 2.9           | 2      |
| CEL4010 TB | 4        | 8            | 10               | 60          | 6              | 3.88          | 2      |
| CEL4012 TB | 4        | 8            | 12               | 60          | 6              | 3.88          | 2      |
| CEL4016 TB | 4        | 8            | 16               | 60          | 6              | 3.88          | 2      |
| CEL4020 TB | 4        | 8            | 20               | 60          | 6              | 3.88          | 2      |
| CEL4025 TB | 4        | 8            | 25               | 75          | 6              | 3.88          | 2      |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ◎                     |

Unit/單位: mm

切削  
條件表  
**P347-348**  
Cutting Condition

## Ball Nose Type - For Copper & Aluminum - 2 flutes

### 2刃銅鋁合金球型立銑刀

600  
Nano



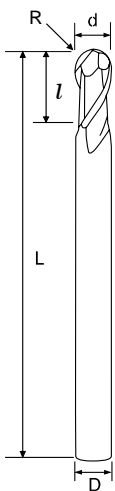
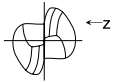
● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE    | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | R 值    | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ACB0102 | 1        | 0.5    | 2            | 50          | 4              | 2      |
| ACB0152 | 1.5      | 0.75   | 3            | 50          | 4              | 2      |
| ACB0202 | 2        | 1      | 4            | 50          | 4              | 2      |
| ACB0252 | 2.5      | 1.25   | 5            | 50          | 4              | 2      |
| ACB0302 | 3        | 1.5    | 6            | 50          | 4              | 2      |
| ACB0352 | 3.5      | 1.75   | 7            | 50          | 4              | 2      |
| ACB0402 | 4        | 2      | 8            | 50          | 4              | 2      |
| ACB0452 | 4.5      | 2.25   | 9            | 50          | 6              | 2      |
| ACB0502 | 5        | 2.5    | 10           | 50          | 6              | 2      |
| ACB0552 | 5.5      | 2.75   | 11           | 50          | 6              | 2      |
| ACB0602 | 6        | 3      | 12           | 50          | 6              | 2      |
| ACB0802 | 8        | 4      | 16           | 60          | 8              | 2      |
| ACB1002 | 10       | 5      | 20           | 75          | 10             | 2      |
| ACB1202 | 12       | 6      | 24           | 75          | 12             | 2      |

• Tolerance for Ball radius : ±0.01mm R容許差



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        | ◎                      | ◎                      |                       |

Unit/單位: mm



切削  
條件表  
P347-348  
Cutting Condition

## Ball Nose Type - For Copper & Aluminum - 2 flutes

### 2刃銅鋁合金球型立銑刀

600  
Nano

25°

TB

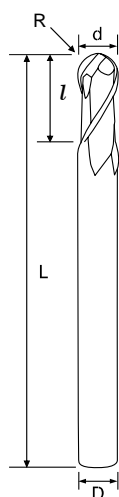
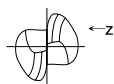
● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | R 值    | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ACB0102 TB | 1        | 0.5    | 2            | 50          | 4              | 2      |
| ACB0152 TB | 1.5      | 0.75   | 3            | 50          | 4              | 2      |
| ACB0202 TB | 2        | 1      | 4            | 50          | 4              | 2      |
| ACB0252 TB | 2.5      | 1.25   | 5            | 50          | 4              | 2      |
| ACB0302 TB | 3        | 1.5    | 6            | 50          | 4              | 2      |
| ACB0352 TB | 3.5      | 1.75   | 7            | 50          | 4              | 2      |
| ACB0402 TB | 4        | 2      | 8            | 50          | 4              | 2      |
| ACB0452 TB | 4.5      | 2.25   | 9            | 50          | 6              | 2      |
| ACB0502 TB | 5        | 2.5    | 10           | 50          | 6              | 2      |
| ACB0552 TB | 5.5      | 2.75   | 11           | 50          | 6              | 2      |
| ACB0602 TB | 6        | 3      | 12           | 50          | 6              | 2      |
| ACB0802 TB | 8        | 4      | 16           | 60          | 8              | 2      |
| ACB1002 TB | 10       | 5      | 20           | 75          | 10             | 2      |
| ACB1202 TB | 12       | 6      | 24           | 75          | 12             | 2      |

• Tolerance for Ball radius : ±0.01mm R容許差



Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ◎                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P407**

## Ball Nose Type - Long Neck - For Copper & Aluminum - 2 flutes

### 2刃長頸銅鋁球型立銑刀

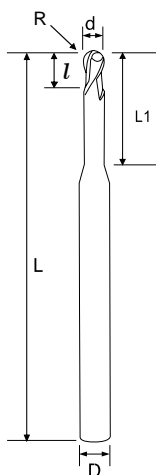
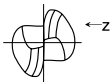
600  
Nano

25°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Neck Diameter | Flutes |
|-------------|----------|--------|--------------|------------------|-------------|----------------|---------------|--------|
| 型號          | d 刃徑     | R 值    | ℓ 刃長         | L1 有效長           | L 全長        | D 柄徑           | 頸徑            | Z 刃數   |
| ACBL1004 TB | 1        | 0.5    | 2            | 4                | 50          | 4              | 0.95          | 2      |
| ACBL1006 TB | 1        | 0.5    | 2            | 6                | 50          | 4              | 0.95          | 2      |
| ACBL1010 TB | 1        | 0.5    | 2            | 10               | 50          | 4              | 0.95          | 2      |
| ACBL1012 TB | 1        | 0.5    | 2            | 12               | 50          | 4              | 0.95          | 2      |
| ACBL1016 TB | 1        | 0.5    | 2            | 16               | 50          | 4              | 0.95          | 2      |
| ACBL1506 TB | 1.5      | 0.75   | 3            | 6                | 50          | 4              | 1.45          | 2      |
| ACBL1510 TB | 1.5      | 0.75   | 3            | 10               | 50          | 4              | 1.45          | 2      |
| ACBL1512 TB | 1.5      | 0.75   | 3            | 12               | 50          | 4              | 1.45          | 2      |
| ACBL1516 TB | 1.5      | 0.75   | 3            | 16               | 50          | 4              | 1.45          | 2      |
| ACBL2008 TB | 2        | 1.0    | 4            | 8                | 50          | 4              | 1.92          | 2      |
| ACBL2012 TB | 2        | 1.0    | 4            | 12               | 50          | 4              | 1.92          | 2      |
| ACBL2014 TB | 2        | 1.0    | 4            | 14               | 50          | 4              | 1.92          | 2      |
| ACBL2020 TB | 2        | 1.0    | 4            | 20               | 50          | 4              | 1.92          | 2      |
| ACBL3012 TB | 3        | 1.5    | 6            | 12               | 50          | 6              | 2.9           | 2      |
| ACBL3016 TB | 3        | 1.5    | 6            | 16               | 50          | 6              | 2.9           | 2      |
| ACBL3020 TB | 3        | 1.5    | 6            | 20               | 60          | 6              | 2.9           | 2      |
| ACBL3025 TB | 3        | 1.5    | 6            | 25               | 75          | 6              | 2.9           | 2      |
| ACBL4010 TB | 4        | 2      | 8            | 10               | 60          | 6              | 3.88          | 2      |
| ACBL4012 TB | 4        | 2      | 8            | 12               | 60          | 6              | 3.88          | 2      |
| ACBL4016 TB | 4        | 2      | 8            | 16               | 60          | 6              | 3.88          | 2      |
| ACBL4020 TB | 4        | 2      | 8            | 20               | 60          | 6              | 3.88          | 2      |
| ACBL4025 TB | 4        | 2      | 8            | 25               | 75          | 6              | 3.88          | 2      |

• Tolerance for Ball radius : ±0.01mm R容許差

Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        |                        | ◎                      | ◎                     |

Unit/單位: mm

AUE

切削條件表  
**P408**  
Cutting Condition

AUEL

切削條件表  
**P409**  
Cutting Condition



## High Feed U-Type For Aluminum - 3 flutes

### 3刃超高速鋁用立銑刀

600 Nano 50°

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AUE0253 | 2.5      | 8            | 50          | 6              | 3      |
| AUE0303 | 3        | 9            | 50          | 6              | 3      |
| AUE0403 | 4        | 12           | 50          | 6              | 3      |
| AUE0503 | 5        | 15           | 50          | 6              | 3      |
| AUE0603 | 6        | 18           | 50          | 6              | 3      |
| AUE0803 | 8        | 20           | 60          | 8              | 3      |
| AUE1003 | 10       | 30           | 75          | 10             | 3      |
| AUE1203 | 12       | 32           | 75          | 12             | 3      |
| AUE1603 | 16       | 45           | 100         | 16             | 3      |
| AUE2003 | 20       | 45           | 100         | 20             | 3      |

### Long Flute - 長刃

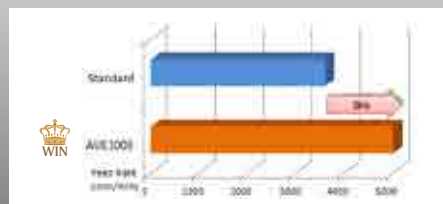
| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AUEL0603 | 6        | 30           | 75          | 6              | 3      |
| AUEL0803 | 8        | 40           | 100         | 8              | 3      |
| AUEL1003 | 10       | 42           | 100         | 10             | 3      |
| AUEL1203 | 12       | 52           | 100         | 12             | 3      |

※ Special U-Type design:  
Material removal rate (MRR) and surface finishes are greatly improved due to effective chip removal at high rate

※ Strong tooth with double relief angles:  
Excellent production rates become 100% possible due to the Improvement of tooth hardness.

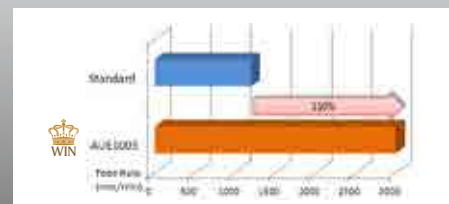
※ Sharp aluminum alloy tooth design Applicable for roughing and finishing

Feed Rate Comparison (Side Milling)



Work piece material: Aluminum alloy expanding material 6061  
Speed: 15000 min-1, Depth of Cut: AP=2.0D, AE=0.5D

Feed Rate Comparison (Slotting)



Work piece material: Aluminum alloy expanding material 6061  
Speed: 10000 min-1, Depth of Cut: AP=2.0D, AE=1.0D

Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ★                     |

Unit/單位: mm



切削條件表 **P410**  
Cutting Condition

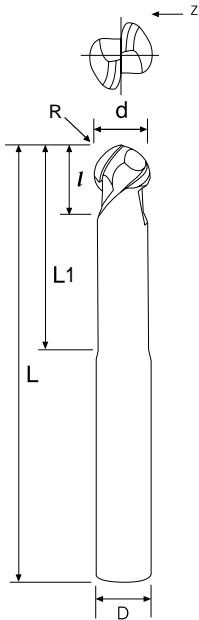
### High Feed Ball Nose Type For Aluminum - 2 flutes

## 2刃鋁用高速球型立銑刀

**400 Nano** **50°** **TB**

● Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| MODE      | Diameter | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------|--------------|------------------|-------------|----------------|--------|
| 型號        | d 刀徑     | R 值    | 刀長           | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| AUB020 TB | 2        | 1      | 1.5          | 8                | 50          | 6              | 2      |
| AUB025 TB | 2.5      | 1.25   | 2            | 10               | 50          | 6              | 2      |
| AUB030 TB | 3        | 1.5    | 2.5          | 12               | 50          | 6              | 2      |
| AUB040 TB | 4        | 2      | 3.5          | 16               | 50          | 6              | 2      |
| AUB050 TB | 5        | 2.5    | 4.5          | 20               | 60          | 6              | 2      |
| AUB060 TB | 6        | 3      | 5.5          | 25               | 60          | 6              | 2      |
| AUB080 TB | 8        | 4      | 7            | 30               | 75          | 8              | 2      |
| AUB100 TB | 10       | 5      | 8.5          | 35               | 75          | 10             | 2      |
| AUB120 TB | 12       | 6      | 10.5         | 40               | 75          | 12             | 2      |
| AUB160 TB | 16       | 8      | 14           | 50               | 100         | 16             | 2      |
| AUB200 TB | 20       | 10     | 17           | 50               | 100         | 20             | 2      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ★                     |

Unit/單位: mm

切削條件表 **P408**  
Cutting Condition

## High Feed Corner Radius Type For Aluminum 3 flutes

### 3刃超高速鋁用圓鼻刀

600  
Nano

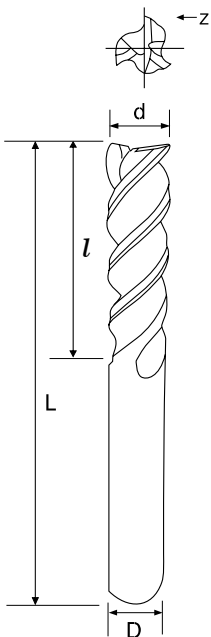


● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|---------------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | R 角           | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AUR060053 | 6        | 0.5           | 15           | 50          | 6              | 3      |
| AUR060103 | 6        | 1             | 15           | 50          | 6              | 3      |
| AUR080053 | 8        | 0.5           | 20           | 60          | 8              | 3      |
| AUR080103 | 8        | 1             | 20           | 60          | 8              | 3      |
| AUR080203 | 8        | 2             | 20           | 60          | 8              | 3      |
| AUR100053 | 10       | 0.5           | 25           | 75          | 10             | 3      |
| AUR100103 | 10       | 1             | 25           | 75          | 10             | 3      |
| AUR100203 | 10       | 2             | 25           | 75          | 10             | 3      |
| AUR120053 | 12       | 0.5           | 30           | 75          | 12             | 3      |
| AUR120103 | 12       | 1             | 30           | 75          | 12             | 3      |
| AUR120203 | 12       | 2             | 30           | 75          | 12             | 3      |
| AUR120303 | 12       | 3             | 30           | 75          | 12             | 3      |
| AUR160053 | 16       | 0.5           | 45           | 100         | 16             | 3      |
| AUR160103 | 16       | 1             | 45           | 100         | 16             | 3      |
| AUR160203 | 16       | 2             | 45           | 100         | 16             | 3      |
| AUR160303 | 16       | 3             | 45           | 100         | 16             | 3      |
| AUR200053 | 20       | 0.5           | 45           | 100         | 20             | 3      |
| AUR200103 | 20       | 1             | 45           | 100         | 20             | 3      |
| AUR200203 | 20       | 2             | 45           | 100         | 20             | 3      |
| AUR200303 | 20       | 3             | 45           | 100         | 20             | 3      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ★                     |

Unit/單位: mm

# AUE PLUS SERIES

High Feed U-Type Aluminum End Mill For Slotting

## 超高速鋁用開槽立銑刀

With Speed Tiger exclusive TB Tetrabond Diamond Coating. Super High lubrication, super low friction coefficient, and longer tool life.

全系列搭配震虎獨家開發 TB 超硬類鑽塗層，  
超高潤滑性、超低摩擦係數、超長壽命

Special U-Type design: Material removal rate (MRR) and surface finishes are greatly improved due to effective chip removal at high rate.

特殊 U 型設計：流暢的切屑排除效果，  
提高移除率、表面光潔度

Strong tooth with double relief angles: Excellent production rates become 100% possible due to the improvement of tooth hardness.

高強度雙離隙刀刃：  
刀刃強度提升、實現了穩定的高效率加工

Sharp aluminum alloy tooth design applicable for roughing and finishing, dry and cutting. 粗精銑皆適用，乾溼加工皆可

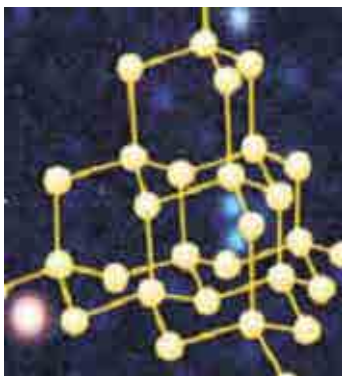


video 切削影片

## TB Coating TB 超硬類鑽膜 系列

DLC coatings are generally deposited by five methods, each having different properties :

DLC 薄膜有 5 種不同的沉積方法，而每一個各有不同的特性：



▲ Molecular Structure 分子結構圖

|                              |  | TB Ta:C     | PVD a:CH    | PVD Me:CH   | CVD        | PaCVD       |
|------------------------------|--|-------------|-------------|-------------|------------|-------------|
| Deposition temp 沉積溫度         |  | under 150 C | under 200 C | under 200 C | over 900 C | under 200 C |
| Range of substrates 基材限制     |  | Broad       | Broad       | Broad       | Limited    | Broad       |
| Oxidation temp 氧化溫度          |  | 500-1000 C  | 350 C       | 300 C       | 700 C      | 300 C       |
| Adhesion 附著力                 |  | Very good   | Good        | Very Good   | Excellent  | Good        |
| Smoothness 平滑度               |  | Good        | Very good   | Good        | Good       | Excellent   |
| Hardness (GPA) 硬度            |  | 60-95       | 25          | 10-15       | 40-90      | 20-40       |
| Coefficient of friction 摩擦係數 |  | <0.1        | <0.1        | 0.15        | <0.4       | <0.1        |
| Hydrogenated 氫化              |  | No          | Yes or No   | Yes         | No         | Yes         |
| Metal content 金屬親和性          |  | No          | Yes         | Yes         | No         | No          |

All DLC coatings are not equal : especially on Hardness and Oxidation 各種類鑽膜都有不同的特性，尤其是硬度和氧化溫度

切削條件表 **P408**  
Cutting Condition

**600** Nano **50°** **TB**

### Specification 規格

| MODE         | Diameter | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|--------------|----------|--------------|------------------|-------------|----------------|--------|
| 型號           | d 刀徑     | L 刀長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| S-AUE0603 TB | 6        | 10           | 15               | 50          | 6              | 3      |
| S-AUE0803 TB | 8        | 13           | 20               | 60          | 8              | 3      |
| S-AUE1003 TB | 10       | 16           | 25               | 75          | 10             | 3      |
| S-AUE1203 TB | 12       | 19           | 30               | 75          | 12             | 3      |

### Extreme Testing 極限測試 - S-AUE1003

| 7th 第 7 次                     |  | 8th 第 8 次  |  | 9th 第 9 次  |                        | 10th 第 10 次                   |                        |  |                        |  |                        |  |
|-------------------------------|--|--|--|--|------------------------|-------------------------------|------------------------|--|------------------------|--|------------------------|--|
| Before Cutting<br>刀具使用前       |  | Before Cutting<br>刀具使用前  |  | Before Cutting<br>刀具使用前  |                        | Before Cutting<br>刀具使用前       |                        |  |                        |  |                        |  |
| Parameter<br>參數               | <p>Cutting Condition 使用參數: Fz:0.36mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:12312mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 180%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.39mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:13338mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 180%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.42mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:14364mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 178%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.45mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:15380mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 174%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | After Cutting<br>刀具使用後 |                               | After Cutting<br>刀具使用後 |  | After Cutting<br>刀具使用後 |  | After Cutting<br>刀具使用後 |  |
| Work Surface<br>工件表面          |  | Work Surface<br>工件表面   |  | Work Surface<br>工件表面   |                        | Work Surface<br>工件表面          |                        |  |                        |  |                        |  |
| Surface Roughness (Ra)<br>粗糙度 |  | Surface Roughness (Ra)<br>粗糙度  |  | Surface Roughness (Ra)<br>粗糙度  |                        | Surface Roughness (Ra)<br>粗糙度 |                        |  |                        |  |                        |  |

| 11th 第 11 次                   |  | 12th 第 12 次  |  | 13th 第 13 次  |                        | 14th 第 14 次                   |                        |  |                        |  |                        |  |
|-------------------------------|--|--|--|--|------------------------|-------------------------------|------------------------|--|------------------------|--|------------------------|--|
| Before Cutting<br>刀具使用前       |  | Before Cutting<br>刀具使用前  |  | Before Cutting<br>刀具使用前  |                        | Before Cutting<br>刀具使用前       |                        |  |                        |  |                        |  |
| Parameter<br>參數               | <p>Cutting Condition 使用參數: Fz:0.49mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:16416mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 174%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.51mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:17442mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 173%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.54mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:18468mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 173%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | <p>Cutting Condition 使用參數: Fz:0.57mm/刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:19494mm/min</p> <p>Machine 使用 CNC 機台: YCM 永進 FV102A</p> <p>Coolant 冷卻方式: Wet Cutting 水冷</p> <p>Work Material 切削素材: AL6061</p> <p>Tool 測試刀款: S-AUE1003</p> <p>Holder 使用刀桿: BT40 Pull Back Holder 後拉式刀桿</p> <p>Tool's Clamping Length 刀具夾持長度: 37mm</p> <p>Cutting Length 切削長度: 0.1m 米</p> <p>Runout of Tool 刀具偏擺: 0.002mm</p> <p>Load of Spindle 主軸負載: 169%</p> <p>Concentration of cutting water 切削水濃度: (°Bx) 10.5°Bx</p> | After Cutting<br>刀具使用後 |                               | After Cutting<br>刀具使用後 |  | After Cutting<br>刀具使用後 |  | After Cutting<br>刀具使用後 |  |
| Work Surface<br>工件表面          |  | Work Surface<br>工件表面   |  | Work Surface<br>工件表面   |                        | Work Surface<br>工件表面          |                        |  |                        |  |                        |  |
| Surface Roughness (Ra)<br>粗糙度 |  | Surface Roughness (Ra)<br>粗糙度  |  | Surface Roughness (Ra)<br>粗糙度  |                        | Surface Roughness (Ra)<br>粗糙度 |                        |  |                        |  |                        |  |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P411**

High Speed Square Type - For Aluminum (Aerospace) - 3 flutes

## ■ 3刃超高速鋁用立銑刀 (航太用)

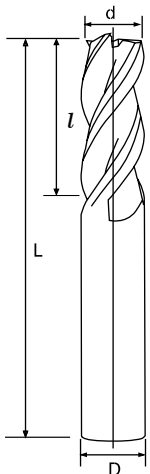
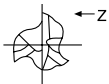
600  
Nano

40°

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AA0203 TB  | 2        | 6            | 50          | 4              | 3      |
| AA0303 TB  | 3        | 8            | 50          | 6              | 3      |
| AA0403 TB  | 4        | 11           | 50          | 6              | 3      |
| AA0503 TB  | 5        | 13           | 60          | 6              | 3      |
| AAS0603 TB | 6        | 13           | 50          | 6              | 3      |
| AA0603 TB  | 6        | 18           | 60          | 6              | 3      |
| AA0703 TB  | 7        | 16           | 75          | 8              | 3      |
| AAS0803 TB | 8        | 19           | 75          | 8              | 3      |
| AA0803 TB  | 8        | 25           | 75          | 8              | 3      |
| AA1003 TB  | 10       | 30           | 75          | 10             | 3      |
| AAS1203 TB | 12       | 26           | 75          | 12             | 3      |
| AA1203 TB  | 12       | 33           | 75          | 12             | 3      |
| AA1603 TB  | 16       | 32           | 100         | 16             | 3      |
| AA2003 TB  | 20       | 38           | 105         | 20             | 3      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ◎                      | ★                     |

Unit/單位: mm

切削條件表 **P412**  
Cutting Condition

Super High Speed Square Type - Long Neck -  
For Aluminum (Aerospace) - 3 flutes

600  
Nano

40°

TB

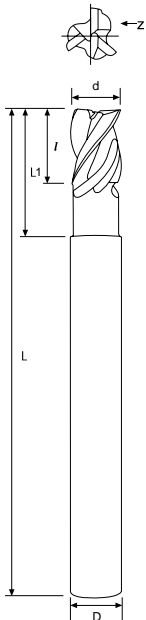
## ■ 3刃超高速鋁用長頸立銑刀 (航太用)

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Efficient Length | Full Length | Shank Diameter | Neck Diameter | Flutes |
|------------|----------|--------------|------------------|-------------|----------------|---------------|--------|
| 型號         | d 刃徑     | Z 刃長         | L1 有效長           | L 全長        | D 柄徑           | 頸徑            | Z 刃數   |
| AAL0206 TB | 2        | 3            | 6                | 50          | 4              | 1.94          | 3      |
| AAL0309 TB | 3        | 4.5          | 9                | 50          | 6              | 2.85          | 3      |
| AAL0412 TB | 4        | 6            | 12               | 50          | 6              | 3.8           | 3      |
| AAL0515 TB | 5        | 7.5          | 15               | 60          | 6              | 4.8           | 3      |
| AAL0618 TB | 6        | 9            | 18               | 60          | 6              | 5.8           | 3      |
| AAL0824 TB | 8        | 12           | 24               | 75          | 8              | 7.8           | 3      |
| AAL1030 TB | 10       | 22           | 30               | 75          | 10             | 9.8           | 3      |
| AAL1236 TB | 12       | 26           | 36               | 75          | 12             | 11.8          | 3      |
| AAL1648 TB | 16       | 32           | 48               | 100         | 16             | 15.8          | 3      |
| AAL2055 TB | 20       | 38           | 55               | 110         | 20             | 19.8          | 3      |



- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表 **P413**  
Cutting Condition

High Speed Corner radius Type - For Aluminum (Aerospace) - 2 flutes

## 2刃鋁用高速圓鼻立銑刀 (航太用)

600 Nano

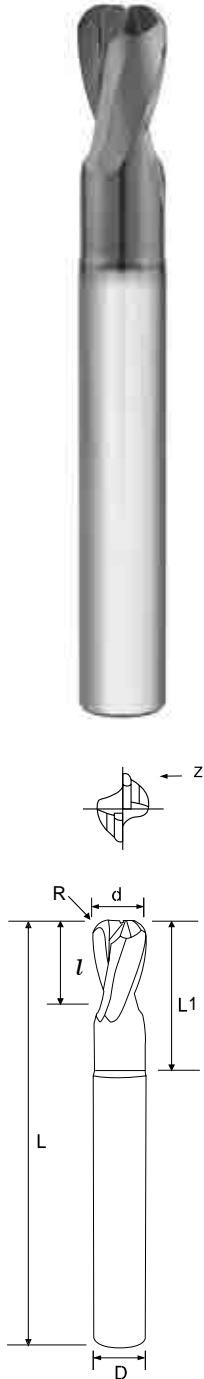
40°

R

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE         | Diameter | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|--------------|----------|---------------|--------------|------------------|-------------|----------------|--------|
| 型號           | d 刀徑     | R 角           | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| CMF020022 TB | 2        | 0.2           | 3            | 6                | 40          | 3              | 2      |
| CMF025022 TB | 2.5      | 0.2           | 3            | 6                | 40          | 3              | 2      |
| CMF030022 TB | 3        | 0.2           | 4            | 8                | 40          | 3              | 2      |
| CMF040022 TB | 4        | 0.2           | 5            | 12               | 50          | 4              | 2      |
| CMF050022 TB | 5        | 0.2           | 8            | 14               | 50          | 5              | 2      |
| CMF060022 TB | 6        | 0.2           | 8            | 18               | 65          | 6              | 2      |
| CMF080022 TB | 8        | 0.2           | 10           | 22               | 70          | 8              | 2      |
| CMF080042 TB | 8        | 0.4           | 10           | 22               | 70          | 8              | 2      |
| CMF080302 TB | 8        | 3             | 10           | 22               | 70          | 8              | 2      |
| CMF100022 TB | 10       | 0.2           | 14           | 28               | 80          | 10             | 2      |
| CMF100042 TB | 10       | 0.4           | 14           | 28               | 80          | 10             | 2      |
| CMF100302 TB | 10       | 3             | 14           | 28               | 80          | 10             | 2      |
| CMF120022 TB | 12       | 0.2           | 16           | 35               | 90          | 12             | 2      |
| CMF120042 TB | 12       | 0.4           | 16           | 35               | 90          | 12             | 2      |
| CMF120252 TB | 12       | 2.5           | 16           | 35               | 90          | 12             | 2      |
| CMF120302 TB | 12       | 3             | 16           | 35               | 90          | 12             | 2      |
| CMF120402 TB | 12       | 4             | 16           | 35               | 90          | 12             | 2      |
| CMF160022 TB | 16       | 0.2           | 20           | 40               | 90          | 16             | 2      |
| CMF160042 TB | 16       | 0.4           | 20           | 40               | 90          | 16             | 2      |
| CMF160252 TB | 16       | 2.5           | 20           | 40               | 90          | 16             | 2      |
| CMF160302 TB | 16       | 3             | 20           | 40               | 90          | 16             | 2      |
| CMF160402 TB | 16       | 4             | 20           | 40               | 90          | 16             | 2      |
| CMF200022 TB | 20       | 0.2           | 25           | 50               | 100         | 20             | 2      |
| CMF200042 TB | 20       | 0.4           | 25           | 50               | 100         | 20             | 2      |
| CMF200252 TB | 20       | 2.5           | 25           | 50               | 100         | 20             | 2      |
| CMF200302 TB | 20       | 3             | 25           | 50               | 100         | 20             | 2      |
| CMF200402 TB | 20       | 4             | 25           | 50               | 100         | 20             | 2      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表 **P414**  
Cutting Condition

High Speed Corner Radius Type - For Aluminum  
(Aerospace) - 3 flutes

## 3刃鋁用高速圓鼻立銑刀 (航太用)

600 Nano

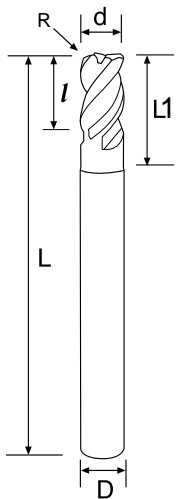
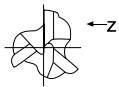
40°

R

TB

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE             | Diameter | R   | Flute Length | Efficient Length | Full Length | Shank Diameter | Neck Diameter | Flutes |
|------------------|----------|-----|--------------|------------------|-------------|----------------|---------------|--------|
| 型號               | d 刃徑     | R 角 | 刀長           | L1 有效長           | L 全長        | D 柄徑           | A 頸徑          | Z 刃數   |
| CA-AA03005009 TB | 3        | 0.5 | 4.5          | 9                | 50          | 6              | 2.7           | 3      |
| CA-AA04005012 TB | 4        | 0.5 | 6            | 12               | 50          | 6              | 3.6           | 3      |
| CA-AA04010012 TB | 4        | 1   | 6            | 12               | 50          | 6              | 3.6           | 3      |
| CA-AA05005015 TB | 5        | 0.5 | 7.5          | 15               | 60          | 6              | 4.5           | 3      |
| CA-AA06003015 TB | 6        | 0.3 | 9            | 15               | 60          | 6              | 5.4           | 3      |
| CA-AA06005015 TB | 6        | 0.5 | 9            | 15               | 60          | 6              | 5.4           | 3      |
| CA-AA06010015 TB | 6        | 1   | 9            | 15               | 60          | 6              | 5.4           | 3      |
| CA-AA08005020 TB | 8        | 0.5 | 12           | 20               | 75          | 8              | 7.2           | 3      |
| CA-AA08010020 TB | 8        | 1   | 12           | 20               | 75          | 8              | 7.2           | 3      |
| CA-AA10005025 TB | 10       | 0.5 | 15           | 25               | 75          | 10             | 9             | 3      |
| CA-AA10010025 TB | 10       | 1   | 15           | 25               | 75          | 10             | 9             | 3      |
| CA-AA12005030 TB | 12       | 0.5 | 18           | 30               | 100         | 12             | 11            | 3      |
| CA-AA12010030 TB | 12       | 1   | 18           | 30               | 100         | 12             | 11            | 3      |
| CA-AA16005040 TB | 16       | 0.5 | 24           | 40               | 105         | 16             | 15            | 3      |
| CA-AA16010040 TB | 16       | 1   | 24           | 40               | 105         | 16             | 15            | 3      |
| CA-AA16030040 TB | 16       | 3   | 24           | 40               | 105         | 16             | 15            | 3      |
| CA-AA20005050 TB | 20       | 0.5 | 30           | 50               | 125         | 20             | 19            | 3      |
| CA-AA20010050 TB | 20       | 1   | 30           | 50               | 125         | 20             | 19            | 3      |
| CA-AA20030050 TB | 20       | 3   | 30           | 50               | 125         | 20             | 19            | 3      |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm



切削條件表  
P415-416  
Cutting Condition

Super High Speed Corner Radius Type - For Aluminum (Aerospace) - 3 flutes

600 Nano

40°

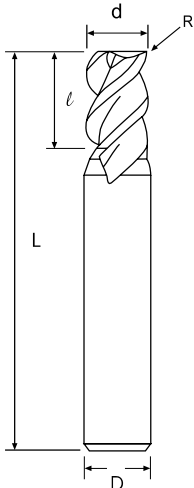
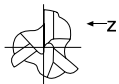
R

TB

## 3刃超高速鋁用圓鼻立銑刀 (航太用)

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE           | Diameter | R    | Flute Length | Full Length | Shank Diameter | Flutes |
|----------------|----------|------|--------------|-------------|----------------|--------|
| 型號             | d 刃徑     | R 角  | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| CR-AA030020 TB | 3        | 0.2  | 8            | 50          | 6              | 3      |
| CR-AA030030 TB | 3        | 0.3  | 8            | 50          | 6              | 3      |
| CR-AA030050 TB | 3        | 0.5  | 8            | 50          | 6              | 3      |
| CR-AA040020 TB | 4        | 0.2  | 11           | 50          | 6              | 3      |
| CR-AA040030 TB | 4        | 0.3  | 11           | 50          | 6              | 3      |
| CR-AA040050 TB | 4        | 0.5  | 11           | 50          | 6              | 3      |
| CR-AA040100 TB | 4        | 1    | 11           | 50          | 6              | 3      |
| CR-AA050020 TB | 5        | 0.2  | 13           | 50          | 6              | 3      |
| CR-AA050050 TB | 5        | 0.5  | 13           | 50          | 6              | 3      |
| CR-AA050100 TB | 5        | 1    | 13           | 50          | 6              | 3      |
| CR-AA060020 TB | 6        | 0.2  | 13           | 50          | 6              | 3      |
| CR-AA060030 TB | 6        | 0.3  | 13           | 50          | 6              | 3      |
| CR-AA060050 TB | 6        | 0.5  | 13           | 50          | 6              | 3      |
| CR-AA060100 TB | 6        | 1    | 13           | 50          | 6              | 3      |
| CR-AA080025 TB | 8        | 0.25 | 19           | 75          | 8              | 3      |
| CR-AA080030 TB | 8        | 0.3  | 19           | 75          | 8              | 3      |
| CR-AA080050 TB | 8        | 0.5  | 19           | 75          | 8              | 3      |
| CR-AA080075 TB | 8        | 0.75 | 19           | 75          | 8              | 3      |
| CR-AA080100 TB | 8        | 1    | 19           | 75          | 8              | 3      |
| CR-AA080120 TB | 8        | 1.2  | 19           | 75          | 8              | 3      |
| CR-AA080150 TB | 8        | 1.5  | 19           | 75          | 8              | 3      |
| CR-AA080200 TB | 8        | 2    | 19           | 75          | 8              | 3      |
| CR-AA100025 TB | 10       | 0.25 | 22           | 75          | 10             | 3      |
| CR-AA100030 TB | 10       | 0.3  | 22           | 75          | 10             | 3      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- (Diagrams of various end mill geometries)

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm

切削條件表  
P415-416  
Cutting Condition

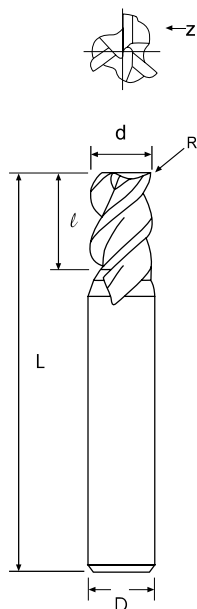
Super High Speed Corner Radius Type - For Aluminum (Aerospace) - 3 flutes



## 3刃超高速鋁用圓鼻立銑刀 (航太用)

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE           | Diameter | R    | Flute Length | Full Length | Shank Diameter | Flutes |
|----------------|----------|------|--------------|-------------|----------------|--------|
| 型號             | d 刃徑     | R 角  | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| CR-AA100040 TB | 10       | 0.4  | 22           | 75          | 10             | 3      |
| CR-AA100050 TB | 10       | 0.5  | 22           | 75          | 10             | 3      |
| CR-AA100075 TB | 10       | 0.75 | 22           | 75          | 10             | 3      |
| CR-AA100080 TB | 10       | 0.8  | 22           | 75          | 10             | 3      |
| CR-AA100100 TB | 10       | 1    | 22           | 75          | 10             | 3      |
| CR-AA100120 TB | 10       | 1.2  | 22           | 75          | 10             | 3      |
| CR-AA100150 TB | 10       | 1.5  | 22           | 75          | 10             | 3      |
| CR-AA100200 TB | 10       | 2    | 22           | 75          | 10             | 3      |
| CR-AA100250 TB | 10       | 2.5  | 22           | 75          | 10             | 3      |
| CR-AA100300 TB | 10       | 3    | 22           | 75          | 10             | 3      |
| CR-AA120050 TB | 12       | 0.5  | 26           | 75          | 12             | 3      |
| CR-AA120100 TB | 12       | 1    | 26           | 75          | 12             | 3      |
| CR-AA120150 TB | 12       | 1.5  | 26           | 75          | 12             | 3      |
| CR-AA120200 TB | 12       | 2    | 26           | 75          | 12             | 3      |
| CR-AA120300 TB | 12       | 3    | 26           | 75          | 12             | 3      |
| CR-AA160100 TB | 16       | 1    | 32           | 100         | 16             | 3      |
| CR-AA160150 TB | 16       | 1.5  | 32           | 100         | 16             | 3      |
| CR-AA160200 TB | 16       | 2    | 32           | 100         | 16             | 3      |
| CR-AA160300 TB | 16       | 3    | 32           | 100         | 16             | 3      |
| CR-AA200100 TB | 20       | 1    | 38           | 105         | 20             | 3      |
| CR-AA200150 TB | 20       | 1.5  | 38           | 105         | 20             | 3      |
| CR-AA200200 TB | 20       | 2    | 38           | 105         | 20             | 3      |
| CR-AA200300 TB | 20       | 3    | 38           | 105         | 20             | 3      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |

Unit/單位: mm



# **Functional** Series

**For**

**Titanium 鈦利晦系列  
Nickel / Inconel Alloy**

**NEW**

**Application**

鈦合金 & 鎳基合金專用刀具



video 切削影片

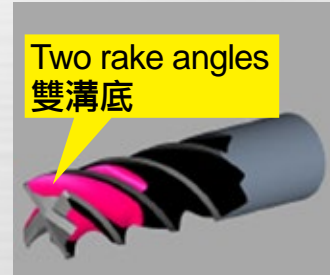
## Anti-Vibration



**Unequal Flute Spacing**  
不等分割



**Unequal Helix Angle**  
不等螺旋

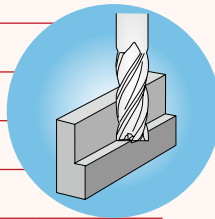


**Special Flute Geometry**  
特殊刃部幾何設計

**壽命更長！震虎鈦合金專用刀壽命可增加 200%!**

Speed Tiger New Series for Titanium Application can prolong too life to 200%

|                          |                                   |                     |                    |
|--------------------------|-----------------------------------|---------------------|--------------------|
| 工具 Tool                  | PVE1T1004                         |                     |                    |
| 工件 Work Material         | Titanium Ti-6Al-4V                |                     |                    |
| 加工方式 Milling Type        | 側銑 Side milling                   |                     |                    |
| 切削速度 Milling Speed       | 79m/min                           |                     |                    |
| 轉速 Rotation Speed (S)    | 2500rpm                           |                     |                    |
| 進給速度 Feed Rate (F)       | 450mm/min                         |                     |                    |
| 每刃進給量 Feed of teeth (fz) | 0.045mm                           |                     |                    |
| 切深 Depth of cut          | ap=20mm<br>ae=3mm                 | 冷卻方式<br>Cooling Way | 水冷<br>watercoolant |
| 使用機台 Machine             | 立式綜合加工機 Vertical Machining Center |                     |                    |



|                       | 切削長度 Milling Length (m) |
|-----------------------|-------------------------|
| PVE1T 1004 (Ø10mm)    | 33 米                    |
| 他牌 Competitor (Ø10mm) | 11 米                    |

**Speed Tiger**  
**3 倍 3 times!!**

Speed Tiger

PVE1T 1004 : 加工 33M 的損耗照片  
PVE1T 1004 : Picture of wear after milling 33m



WIXXX

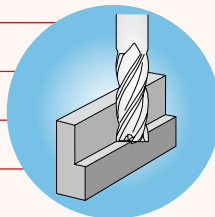
他牌 : 加工 11M 的損耗照片  
Competitor : Picture of wear after milling 11m



**震虎鈦合金專用刀能夠有效減少加工時產生的震顫，銑出良好的加工表面**

Speed Tiger New Series for Titanium Application enable to operate stable without chipping and produce a superb surface finish.

|                          |                                   |                     |                     |
|--------------------------|-----------------------------------|---------------------|---------------------|
| 工具 Tool                  | PVE1T1004                         |                     |                     |
| 工件 Work Material         | Titanium Ti-6Al-4V                |                     |                     |
| 加工方式 Milling Type        | 側銑 Side milling                   |                     |                     |
| 切削速度 Milling Speed       | 79m/min                           |                     |                     |
| 轉速 Rotation Speed (S)    | 2500rpm                           |                     |                     |
| 進給速度 Feed Rate (F)       | 450mm/min                         |                     |                     |
| 每刃進給量 Feed of teeth (fz) | 0.045mm                           |                     |                     |
| 切深 Depth of cut          | ap=20mm<br>ae=3mm                 | 冷卻方式<br>Cooling Way | 水冷<br>water coolant |
| 使用機台 Machine             | 立式綜合加工機 Vertical Machining Center |                     |                     |



PVE1T1004 : 加工表面良好  
Favorable Machined Surface



他牌 : 一般加工表面  
Competitor : General Machined Surface



切 削 條件表 **P417**  
Cutting Condition

## Square Type For Exotic Materials

### ■ 難切削材專用立銑刀

400 PLUS

HRC > 45



ZrN-A



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes | Corner Chamfer Width |
|-----------|----------|--------------|-------------|----------------|--------|----------------------|
| 型號        | d 刃徑     | 刃長           | L全長         | D柄徑            | Z刃數    | C角                   |
| PVE1T0404 | 4        | 8            | 50          | 6              | 4      | 0.2                  |
| PVE1T0504 | 5        | 10           | 50          | 6              | 4      | 0.25                 |
| PVE1T0604 | 6        | 12           | 50          | 6              | 4      | 0.3                  |
| PVE1T0804 | 8        | 19           | 60          | 8              | 4      | 0.4                  |
| PVE1T1004 | 10       | 23           | 75          | 10             | 4      | 0.5                  |
| PVE1T1204 | 12       | 27           | 75          | 12             | 4      | 0.6                  |
| PVE1T1604 | 16       | 32           | 100         | 16             | 4      | 0.8                  |
| PVE1T2004 | 20       | 39           | 100         | 20             | 4      | 1                    |

Unit:mm

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65

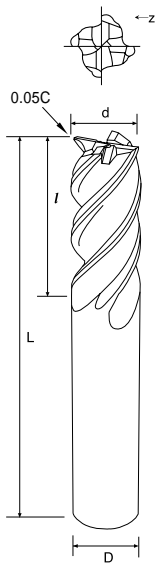


### Long Flute



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes | Corner Chamfer Width |
|------------|----------|--------------|-------------|----------------|--------|----------------------|
| 型號         | d 刃徑     | 刃長           | L全長         | D柄徑            | Z刃數    | C角                   |
| PLVE1T0404 | 4        | 13           | 75          | 6              | 4      | 0.2                  |
| PLVE1T0504 | 5        | 16           | 75          | 6              | 4      | 0.25                 |
| PLVE1T0604 | 6        | 21           | 75          | 6              | 4      | 0.3                  |
| PLVE1T0804 | 8        | 31           | 100         | 8              | 4      | 0.4                  |
| PLVE1T1004 | 10       | 37           | 100         | 10             | 4      | 0.5                  |
| PLVE1T1204 | 12       | 44           | 100         | 12             | 4      | 0.6                  |
| PLVE1T1604 | 16       | 53           | 150         | 16             | 4      | 0.8                  |
| PLVE1T2004 | 20       | 62           | 150         | 20             | 4      | 1                    |

Unit:mm



Application 適用材質：

★ Perfect 最推薦      ◎ Excellent 適合      ○ Good 佳

| <30HRC | 30-40HRC | 40-50HRC | 50-65HRC | Carbon steel, Alloy steel<br>碳素鋼, 合金鋼 | Stainless steel<br>不銹鋼 | Titanium alloy<br>鈦合金 | Nickel/Inconel alloy<br>鎳基合金 | Aluminum alloy<br>鋁合金 | Copper alloy<br>銅合金 |
|--------|----------|----------|----------|---------------------------------------|------------------------|-----------------------|------------------------------|-----------------------|---------------------|
|        | ◎        | ○        |          |                                       |                        | ◎                     | ◎                            |                       |                     |

Unit/單位: mm

切削  
條件表 **P418**  
Cutting Condition

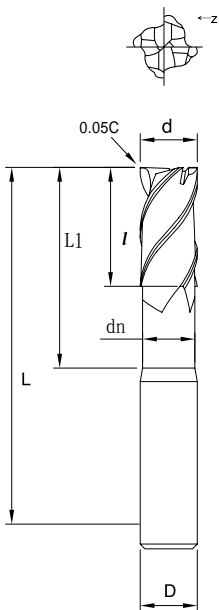
Square Type For Exotic Materials

## ■ 難切削材專用立銑刀



| MODE       | Diameter | Flute Length | Efficient Length | Neck Diameter | Full Length | Shank Diameter | Flutes | Corner Chamfer Width |
|------------|----------|--------------|------------------|---------------|-------------|----------------|--------|----------------------|
| 型號         | d 刃徑     | 刃長           | L1有效長            | dn 頸徑         | L全長         | D柄徑            | Z 刃數   | C 角                  |
| PNVE1T0404 | 4        | 6            | 22               | 3.7           | 75          | 6              | 4      | 0.2                  |
| PNVE1T0504 | 5        | 8            | 24               | 4.6           | 75          | 6              | 4      | 0.25                 |
| PNVE1T0604 | 6        | 9            | 26               | 5.5           | 75          | 6              | 4      | 0.3                  |
| PNVE1T0804 | 8        | 12           | 35               | 7.4           | 100         | 8              | 4      | 0.4                  |
| PNVE1T1004 | 10       | 15           | 43               | 9.2           | 120         | 10             | 4      | 0.5                  |
| PNVE1T1204 | 12       | 18           | 51               | 11            | 120         | 12             | 4      | 0.6                  |
| PNVE1T1604 | 16       | 24           | 59               | 15            | 120         | 16             | 4      | 0.8                  |

Unit:mm



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| <30HRC | 30-40HRC | 40-50HRC | 50-65HRC | Carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Stainless steel<br>不銹鋼 | Titanium alloy<br>鈦合金 | Nickel/Inconel<br>alloy<br>鎳基合金 | Aluminum<br>alloy<br>鋁合金 | Copper alloy<br>銅合金 |
|--------|----------|----------|----------|--|------------------------|-----------------------|---------------------------------|--------------------------|---------------------|
|        | ◎        | ○        |          |  |                        | ◎                     | ◎                               |                          |                     |

Unit/單位: mm

切削條件表 **P418**  
Cutting Condition

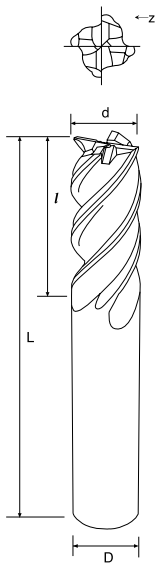
Square Type For Exotic Materials

### ■ 難切削材專用精銑刀



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | 刃長           | L全長         | D柄徑            | Z刃數    |
| PVE1TF0404 | 4        | 8            | 50          | 6              | 4      |
| PVE1TF0504 | 5        | 10           | 50          | 6              | 4      |
| PVE1TF0604 | 6        | 12           | 50          | 6              | 4      |
| PVE1TF0804 | 8        | 19           | 60          | 8              | 4      |
| PVE1TF1004 | 10       | 23           | 75          | 10             | 4      |
| PVE1TF1204 | 12       | 27           | 75          | 12             | 4      |
| PVE1TF1604 | 16       | 32           | 100         | 16             | 4      |
| PVE1TF2004 | 20       | 39           | 100         | 20             | 4      |

Unit:mm



- HRC > 40
- HRC > 45**
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- (Various flute patterns)

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| <30HRC | 30-40HRC | 40-50HRC | 50-65HRC | Carbon steel, Alloy steel<br>碳素鋼, 合金鋼 | Stainless steel<br>不銹鋼 | Titanium alloy<br>鈦合金 | Nickel/Inconel alloy<br>鎳基合金 | Aluminum alloy<br>鋁合金 | Copper alloy<br>銅合金 |
|--------|----------|----------|----------|---------------------------------------|------------------------|-----------------------|------------------------------|-----------------------|---------------------|
|        | ◎        | ○        |          |                                       |                        | ◎                     | ◎                            |                       |                     |

Unit/單位: mm



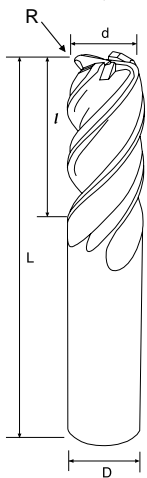
切削  
條件表  
**P418**  
Cutting Condition

Corner Radius Type For Exotic Materials

## ■ 難切削材專用圓鼻立銑刀

400  
PLUS

HRC  
▶ 45



| MODE        | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|---------------|--------------|-------------|----------------|--------|
| 型號          | d 刃徑     | R 角           | 刃長           | L全長         | D柄徑            | Z刃數    |
| PVR1T040054 | 4        | 0.5           | 8            | 50          | 6              | 4      |
| PVR1T050054 | 5        | 0.5           | 10           | 50          | 6              | 4      |
| PVR1T060054 | 6        | 0.5           | 12           | 50          | 6              | 4      |
| PVR1T060104 | 6        | 1             | 12           | 50          | 6              | 4      |
| PVR1T080054 | 8        | 0.5           | 19           | 60          | 8              | 4      |
| PVR1T080104 | 8        | 1             | 19           | 60          | 8              | 4      |
| PVR1T080204 | 8        | 2             | 19           | 60          | 8              | 4      |
| PVR1T100054 | 10       | 0.5           | 23           | 75          | 10             | 4      |
| PVR1T100104 | 10       | 1             | 23           | 75          | 10             | 4      |
| PVR1T100204 | 10       | 2             | 23           | 75          | 10             | 4      |
| PVR1T120054 | 12       | 0.5           | 27           | 75          | 12             | 4      |
| PVR1T120104 | 12       | 1             | 27           | 75          | 12             | 4      |
| PVR1T120204 | 12       | 2             | 27           | 75          | 12             | 4      |
| PVR1T120304 | 12       | 3             | 27           | 75          | 12             | 4      |
| PVR1T160104 | 16       | 1             | 32           | 100         | 16             | 4      |
| PVR1T160204 | 16       | 2             | 32           | 100         | 16             | 4      |
| PVR1T160304 | 16       | 3             | 32           | 100         | 16             | 4      |
| PVR1T160404 | 16       | 4             | 32           | 100         | 16             | 4      |
| PVR1T200104 | 20       | 1             | 39           | 100         | 20             | 4      |
| PVR1T200204 | 20       | 2             | 39           | 100         | 20             | 4      |
| PVR1T200304 | 20       | 3             | 39           | 100         | 20             | 4      |
| PVR1T200404 | 20       | 4             | 39           | 100         | 20             | 4      |

Unit:mm

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| <30HRC | 30-40HRC | 40-50HRC | 50-65HRC | Carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Stainless steel<br>不銹鋼 | Titanium alloy<br>鈦合金 | Nickel/Inconel<br>alloy<br>鎳基合金 | Aluminum<br>alloy<br>鋁合金 | Copper alloy<br>銅合金 |
|--------|----------|----------|----------|--|------------------------|-----------------------|---------------------------------|--------------------------|---------------------|
|        | ◎        | ○        |          |  |                        | ◎                     | ◎                               |                          |                     |

Unit/單位: mm

- 從精切到粗銑 From Finishing and Roughing
- 從乾式到濕式 From Wet and Dry Cutting
- 從不鏽鋼、鈦合金到鑄鐵、模具鋼  
From Stainless Steels, Titanium Alloy, Cast Iron, Mold Steels
- 得簡化 Get Simplification
- 得萬用 Get Universal
- 得效率 Get Efficiency
- 得金錢 Get Reducing Cost



## RS Series

## Details 產品特點

## Technical Data

## 瞭解RS塗層 Feature of RS coating

- 抗熱 Oxidation start temperature : 1,000°C
- 硬度 Hardness: 2,800HV
- 摩擦係數 Coefficient of friction : 0.4
- 薄膜厚度 Thickness ( $\mu$ ) : 3~ 4  $\mu$
- 顏色 Color:銀色 Silver
- 乾、濕式切削，加工軟材為一般AlTiN的2至3倍壽命。  
Dry and Wet Coolant , Cutting performance of soft material improved by 2~3 times than Altin Coating



## CrSiN與CrN差別在何? Difference between CrSiN and CrN

- CrSiN:含Si能夠細化CrN晶粒，甚至可達奈米等級，除具CrN一切優點外更可提高其硬度至30~40GPa，且耐熱溫度可達到1,000度。  
CrSiN Coating can improve the CrN grain to be reached NANO grade. Excepting the all advantage of CrN coating, it drastically improves the hardness to 30~40GPa and Oxidation start temperature:1,000°C
- CrN:含Cr對鐵金屬的親和性相當低，大都不與鐵材產生反應，其真正潤滑性使鍍膜擁有不沾粘之特性且具備低摩擦係數，唯美中不足其硬度僅有17~20GPa且其耐熱溫度僅為700度。  
CrN coating with Cr element has low affinity with Fe material. It exhibits lower friction than that of conventional coating. But the Hardness only 17~20GPa and the Oxidation Start Temperature 700°C.

## Rs塗層應用在哪? Application of RS

- 乾式加工 Dry Cutting
- 濕式加工 Wet Cutting
- 一般加工 General Cutting
- 高速加工 High Speed Cutting
- 鑄鐵、不鏽鋼、鈦合金、炭素鋼、銅、鋁...等幾乎包含所有被加工材  
Cast Iron, Stainless, Titanium Alloy, Carbon Steel, Copper, Aluminum

## Rs塗層優點 Advantage of RS

- 大幅增加刀具、模具之使用壽命 Improve the tooling and mold life
- 增加製造良率 Improve productivity and product quality
- 提高工件表面品質 Better Surface finish
- 增加脫膜性 Mold Release forces
- 提高切削條件 Improved Cutting Condition

切削條件表 **P332**  
Cutting Condition

### Miniature Square Type - 2 flutes

## ■ 2刃微小徑立銑刀

600 Nano

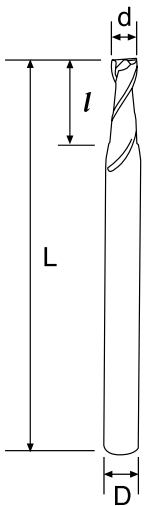
HRC 50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
| 型號         | d 刀徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUMIE 0022 | 0.2      | 0.4          | 50          | 4              | 2      |
| SUMIE 0032 | 0.3      | 0.6          | 50          | 4              | 2      |
| SUMIE 0042 | 0.4      | 0.8          | 50          | 4              | 2      |
| SUMIE 0052 | 0.5      | 1            | 50          | 4              | 2      |
| SUMIE 0062 | 0.6      | 1.2          | 50          | 4              | 2      |
| SUMIE 0072 | 0.7      | 1.4          | 50          | 4              | 2      |
| SUMIE 0082 | 0.8      | 1.6          | 50          | 4              | 2      |
| SUMIE 0092 | 0.9      | 1.8          | 50          | 4              | 2      |
| SUMIE 0102 | 1        | 3            | 50          | 4              | 2      |
| SUMIE 0112 | 1.1      | 3            | 50          | 4              | 2      |
| SUMIE 0122 | 1.2      | 3            | 50          | 4              | 2      |
| SUMIE 0132 | 1.3      | 3            | 50          | 4              | 2      |
| SUMIE 0142 | 1.4      | 3            | 50          | 4              | 2      |
| SUMIE 0152 | 1.5      | 4            | 50          | 4              | 2      |
| SUMIE 0162 | 1.6      | 4            | 50          | 4              | 2      |
| SUMIE 0172 | 1.7      | 4            | 50          | 4              | 2      |
| SUMIE 0182 | 1.8      | 4            | 50          | 4              | 2      |
| SUMIE 0192 | 1.9      | 4            | 50          | 4              | 2      |
| SUMIE 0202 | 2        | 6            | 50          | 4              | 2      |
| SUMIE 0212 | 2.1      | 6            | 50          | 4              | 2      |
| SUMIE 0222 | 2.2      | 6            | 50          | 4              | 2      |
| SUMIE 0232 | 2.3      | 6            | 50          | 4              | 2      |
| SUMIE 0242 | 2.4      | 6            | 50          | 4              | 2      |
| SUMIE 0252 | 2.5      | 8            | 50          | 4              | 2      |
| SUMIE 0262 | 2.6      | 8            | 50          | 4              | 2      |
| SUMIE 0272 | 2.7      | 8            | 50          | 4              | 2      |
| SUMIE 0282 | 2.8      | 8            | 50          | 4              | 2      |
| SUMIE 0292 | 2.9      | 8            | 50          | 4              | 2      |
| SUMIE 0302 | 3        | 8            | 50          | 4              | 2      |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]
- [Symbol]

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ○                     | ○      | ○      | ◎      | ○                      | ○                      |                       |

Unit/單位: mm

切削條件表  
Cutting Condition

**P332**

## Square Type - Helix angle 45° - 2 flutes

### ■ 2刃45° 立銑刀

600  
Nano

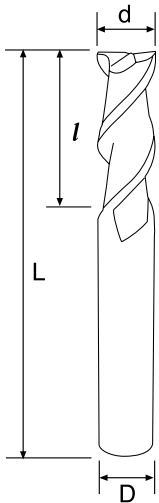
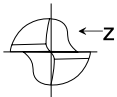
HRC  
50

45°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUPE0102 | 1        | 3            | 50          | 6              | 2      |
| SUPE3102 | 1        | 3            | 50          | 3              | 2      |
| SUPE4102 | 1        | 3            | 50          | 4              | 2      |
| SUPE0152 | 1.5      | 4            | 50          | 6              | 2      |
| SUPE3152 | 1.5      | 4            | 50          | 3              | 2      |
| SUPE4152 | 1.5      | 4            | 50          | 4              | 2      |
| SUPE0202 | 2        | 6            | 50          | 6              | 2      |
| SUPE3202 | 2        | 6            | 50          | 3              | 2      |
| SUPE4202 | 2        | 6            | 50          | 4              | 2      |
| SUPE0252 | 2.5      | 8            | 50          | 6              | 2      |
| SUPE3252 | 2.5      | 8            | 50          | 3              | 2      |
| SUPE4252 | 2.5      | 8            | 50          | 4              | 2      |
| SUPE0302 | 3        | 8            | 50          | 6              | 2      |
| SUPE3302 | 3        | 8            | 50          | 3              | 2      |
| SUPE4302 | 3        | 8            | 50          | 4              | 2      |
| SUPE0352 | 3.5      | 10           | 50          | 6              | 2      |
| SUPE4352 | 3.5      | 10           | 50          | 4              | 2      |
| SUPE0402 | 4        | 11           | 50          | 6              | 2      |
| SUPE4402 | 4        | 11           | 50          | 4              | 2      |
| SUPE0452 | 4.5      | 13           | 50          | 6              | 2      |
| SUPE0502 | 5        | 13           | 50          | 6              | 2      |
| SUPE0552 | 5.5      | 13           | 50          | 6              | 2      |
| SUPE0602 | 6        | 16           | 50          | 6              | 2      |
| SUPE0652 | 6.5      | 16           | 60          | 8              | 2      |
| SUPE0702 | 7        | 16           | 60          | 8              | 2      |
| SUPE0752 | 7.5      | 19           | 60          | 8              | 2      |
| SUPE0802 | 8        | 20           | 60          | 8              | 2      |
| SUPE0852 | 8.5      | 20           | 75          | 10             | 2      |
| SUPE0902 | 9        | 20           | 75          | 10             | 2      |
| SUPE0952 | 9.5      | 25           | 75          | 10             | 2      |
| SUPE1002 | 10       | 25           | 75          | 10             | 2      |
| SUPE1052 | 10.5     | 25           | 75          | 12             | 2      |
| SUPE1102 | 11       | 30           | 75          | 12             | 2      |
| SUPE1152 | 11.5     | 30           | 75          | 12             | 2      |
| SUPE1202 | 12       | 32           | 75          | 12             | 2      |
| SUPE1402 | 14       | 40           | 100         | 16             | 2      |
| SUPE1602 | 16       | 40           | 100         | 16             | 2      |
| SUPE1802 | 18       | 45           | 100         | 20             | 2      |
| SUPE2002 | 20       | 45           | 100         | 20             | 2      |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition

**P419**

## Square Type - Helix Angle 45° - 3 flutes

### ■ 3刃45° 立銑刀

600  
Nano

HRC  
50

45°

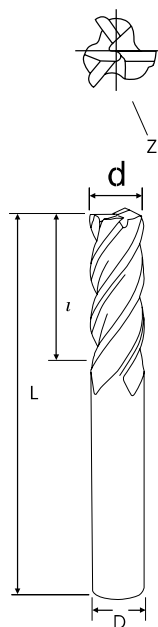
RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUPE0103 | 1        | 3            | 50          | 6              | 3      |
| SUPE4103 | 1        | 3            | 50          | 4              | 3      |
| SUPE0153 | 1.5      | 4            | 50          | 6              | 3      |
| SUPE4153 | 1.5      | 4            | 50          | 4              | 3      |
| SUPE0203 | 2        | 6            | 50          | 6              | 3      |
| SUPE4203 | 2        | 6            | 50          | 4              | 3      |
| SUPE0253 | 2.5      | 8            | 50          | 6              | 3      |
| SUPE4253 | 2.5      | 8            | 50          | 4              | 3      |
| SUPE0303 | 3        | 8            | 50          | 6              | 3      |
| SUPE3303 | 3        | 8            | 50          | 3              | 3      |
| SUPE4303 | 3        | 8            | 50          | 4              | 3      |
| SUPE0353 | 3.5      | 10           | 50          | 6              | 3      |
| SUPE4353 | 3.5      | 10           | 50          | 4              | 3      |
| SUPE0403 | 4        | 11           | 50          | 6              | 3      |
| SUPE4403 | 4        | 11           | 50          | 4              | 3      |
| SUPE0453 | 4.5      | 13           | 50          | 6              | 3      |
| SUPE0503 | 5        | 13           | 50          | 6              | 3      |
| SUPE0553 | 5.5      | 13           | 50          | 6              | 3      |



- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]
- [Icon]

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition

**P419**

## Square Type - Helix Angle 45° - 3 flutes

### ■ 3刃45° 立銑刀

600  
Nano

HRC  
50

45°

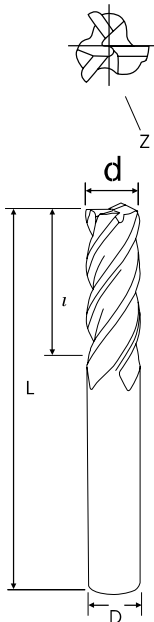
RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | Z 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUPE0603 | 6        | 16           | 50          | 6              | 3      |
| SUPE0653 | 6.5      | 16           | 60          | 8              | 3      |
| SUPE0703 | 7        | 16           | 60          | 8              | 3      |
| SUPE0753 | 7.5      | 19           | 60          | 8              | 3      |
| SUPE0803 | 8        | 20           | 60          | 8              | 3      |
| SUPE0853 | 8.5      | 20           | 75          | 10             | 3      |
| SUPE0903 | 9        | 20           | 75          | 10             | 3      |
| SUPE0953 | 9.5      | 25           | 75          | 10             | 3      |
| SUPE1003 | 10       | 30           | 75          | 10             | 3      |
| SUPE1053 | 10.5     | 30           | 75          | 12             | 3      |
| SUPE1103 | 11       | 30           | 75          | 12             | 3      |
| SUPE1153 | 11.5     | 30           | 75          | 12             | 3      |
| SUPE1203 | 12       | 32           | 75          | 12             | 3      |
| SUPE1403 | 14       | 40           | 100         | 16             | 3      |
| SUPE1603 | 16       | 40           | 100         | 16             | 3      |
| SUPE1803 | 18       | 45           | 100         | 20             | 3      |
| SUPE2003 | 20       | 45           | 100         | 20             | 3      |



HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ○                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
P336-337  
Cutting Condition

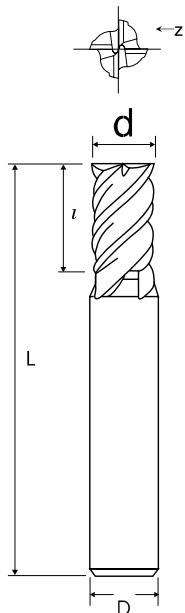
## Square Type - Helix angle 45° - 4 flutes

### 4刃45° 立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刀徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUPE0104 | 1        | 3            | 50          | 6              | 4      |
| SUPE4104 | 1        | 3            | 50          | 4              | 4      |
| SUPE0154 | 1.5      | 4            | 50          | 6              | 4      |
| SUPE4154 | 1.5      | 4            | 50          | 4              | 4      |
| SUPE0204 | 2        | 6            | 50          | 6              | 4      |
| SUPE4204 | 2        | 6            | 50          | 4              | 4      |
| SUPE0254 | 2.5      | 8            | 50          | 6              | 4      |
| SUPE4254 | 2.5      | 8            | 50          | 4              | 4      |
| SUPE0304 | 3        | 8            | 50          | 6              | 4      |
| SUPE3304 | 3        | 8            | 50          | 3              | 4      |
| SUPE4304 | 3        | 8            | 50          | 4              | 4      |
| SUPE0354 | 3.5      | 10           | 50          | 6              | 4      |
| SUPE4354 | 3.5      | 10           | 50          | 4              | 4      |
| SUPE0404 | 4        | 11           | 50          | 6              | 4      |
| SUPE4404 | 4        | 11           | 50          | 4              | 4      |
| SUPE0454 | 4.5      | 13           | 50          | 6              | 4      |
| SUPE0504 | 5        | 13           | 50          | 6              | 4      |
| SUPE0554 | 5.5      | 13           | 50          | 6              | 4      |
| SUPE0604 | 6        | 16           | 50          | 6              | 4      |
| SUPE0654 | 6.5      | 16           | 60          | 8              | 4      |
| SUPE0704 | 7        | 16           | 60          | 8              | 4      |
| SUPE0754 | 7.5      | 19           | 60          | 8              | 4      |
| SUPE0804 | 8        | 20           | 60          | 8              | 4      |
| SUPE0854 | 8.5      | 20           | 75          | 10             | 4      |
| SUPE0904 | 9        | 20           | 75          | 10             | 4      |
| SUPE0954 | 9.5      | 25           | 75          | 10             | 4      |
| SUPE1004 | 10       | 30           | 75          | 10             | 4      |
| SUPE1054 | 10.5     | 30           | 75          | 12             | 4      |
| SUPE1104 | 11       | 30           | 75          | 12             | 4      |
| SUPE1154 | 11.5     | 30           | 75          | 12             | 4      |
| SUPE1204 | 12       | 32           | 75          | 12             | 4      |
| SUPE1404 | 14       | 40           | 100         | 16             | 4      |
| SUPE1604 | 16       | 40           | 100         | 16             | 4      |
| SUPE1804 | 18       | 45           | 100         | 20             | 4      |
| SUPE2004 | 20       | 45           | 100         | 20             | 4      |

- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm



切削條件表  
Cutting Condition

**P420**

Square Type - Long Flute - Helix angle 45° - 4 flutes

## ■ 4刃45° 長刃立銑刀

600  
Nano

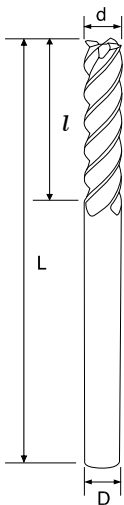
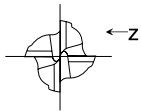
HRC  
▶ 50

45°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刀徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SULPE0104 | 1        | 4            | 60          | 6              | 4      |
| SULPE0154 | 1.5      | 6            | 60          | 6              | 4      |
| SULPE0204 | 2        | 8            | 60          | 6              | 4      |
| SULPE0254 | 2.5      | 10           | 60          | 6              | 4      |
| SULPE0304 | 3        | 12           | 60          | 6              | 4      |
| SULPE0404 | 4        | 16           | 60          | 6              | 4      |
| SULPE0504 | 5        | 21           | 60          | 6              | 4      |
| SULPE0604 | 6        | 26           | 75          | 6              | 4      |
| SULPE0804 | 8        | 31           | 75          | 8              | 4      |
| SULPE1004 | 10       | 35           | 100         | 10             | 4      |
| SULPE1204 | 12       | 40           | 100         | 12             | 4      |
| SULPE1604 | 16       | 61           | 150         | 16             | 4      |
| SULPE2004 | 20       | 76           | 150         | 20             | 4      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P358**

## Square Type - Long Flute - 2 flutes

### ■ 2刃長刃立銑刀

600  
Nano

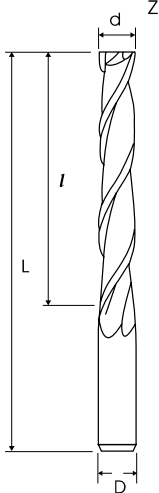
HRC  
50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SULET0102 | 1        | 7            | 50          | 4              | 2      |
| SULET0152 | 1.5      | 9            | 50          | 4              | 2      |
| SULET0202 | 2        | 12           | 50          | 4              | 2      |
| SULET0252 | 2.5      | 12           | 50          | 4              | 2      |
| SULET0302 | 3        | 15           | 60          | 6              | 2      |
| SULET0352 | 3.5      | 15           | 60          | 6              | 2      |
| SULET0402 | 4        | 20           | 75          | 6              | 2      |
| SULET0452 | 4.5      | 20           | 75          | 6              | 2      |
| SULET0502 | 5        | 25           | 75          | 6              | 2      |
| SULET0552 | 5.5      | 25           | 75          | 6              | 2      |
| SULET0602 | 6        | 30           | 75          | 6              | 2      |
| SULET0702 | 7        | 30           | 100         | 8              | 2      |
| SULET0802 | 8        | 40           | 100         | 8              | 2      |
| SULET0902 | 9        | 40           | 100         | 10             | 2      |
| SULET1002 | 10       | 40           | 100         | 10             | 2      |
| SULET1102 | 11       | 40           | 100         | 12             | 2      |
| SULET1202 | 12       | 50           | 100         | 12             | 2      |
| SULET1402 | 14       | 50           | 150         | 16             | 2      |
| SULET1602 | 16       | 60           | 150         | 16             | 2      |
| SULET2002 | 20       | 90           | 200         | 20             | 2      |

- HRC > 40
- HRC > 45
- HRC > 50**
- HRC > 55
- HRC > 60
- HRC > 65
- ☐
- ⊕
- ⊖
- ⊗
- ⊘
- ⊙
- ⊚
- ⊛
- ⊜
- ⊝
- ⊞
- ⊟
- ⊠
- ⊡
- ⊢
- ⊣
- ⊤
- ⊥
- ⊦
- ⊧
- ⊨
- ⊩
- ⊪
- ⊫
- ⊬
- ⊭
- ⊮
- ⊯
- ⊰
- ⊱
- ⊲
- ⊳
- ⊴
- ⊵
- ⊶
- ⊷
- ⊸
- ⊹
- ⊺
- ⊻
- ⊼
- ⊽
- ⊾
- ⊿

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm



切削條件表  
Cutting Condition  
**P406**

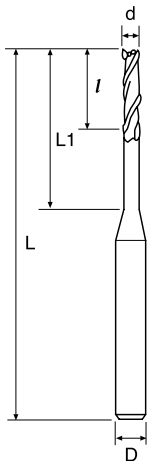
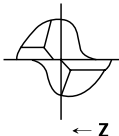
### Square Type - Long Neck - 2 flutes

## 2刃深溝專用長頸立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6µm



| MODE       | Diameter | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|------------------|-------------|----------------|--------|
| 型號         | d 刃徑     | ℓ 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| SULNT05022 | 0.5      | 0.75         | 2                | 50          | 4              | 2      |
| SULNT05042 | 0.5      | 0.75         | 4                | 50          | 4              | 2      |
| SULNT05062 | 0.5      | 0.75         | 6                | 50          | 4              | 2      |
| SULNT06022 | 0.6      | 0.9          | 2                | 50          | 4              | 2      |
| SULNT06042 | 0.6      | 0.9          | 4                | 50          | 4              | 2      |
| SULNT06062 | 0.6      | 0.9          | 6                | 50          | 4              | 2      |
| SULNT07042 | 0.7      | 1.1          | 4                | 50          | 4              | 2      |
| SULNT07062 | 0.7      | 1.1          | 6                | 50          | 4              | 2      |
| SULNT08042 | 0.8      | 1.2          | 4                | 50          | 4              | 2      |
| SULNT08062 | 0.8      | 1.2          | 6                | 50          | 4              | 2      |
| SULNT08082 | 0.8      | 1.2          | 8                | 50          | 4              | 2      |
| SULNT09062 | 0.9      | 1.4          | 6                | 50          | 4              | 2      |
| SULNT09082 | 0.9      | 1.4          | 8                | 50          | 4              | 2      |
| SULNT09102 | 0.9      | 1.4          | 10               | 50          | 4              | 2      |
| SULNT10062 | 1        | 1.5          | 6                | 50          | 4              | 2      |
| SULNT10082 | 1        | 1.5          | 8                | 50          | 4              | 2      |
| SULNT10102 | 1        | 1.5          | 10               | 50          | 4              | 2      |
| SULNT10122 | 1        | 1.5          | 12               | 50          | 4              | 2      |
| SULNT10162 | 1        | 1.5          | 16               | 50          | 4              | 2      |
| SULNT12062 | 1.2      | 1.8          | 6                | 50          | 4              | 2      |
| SULNT12082 | 1.2      | 1.8          | 8                | 50          | 4              | 2      |
| SULNT12102 | 1.2      | 1.8          | 10               | 50          | 4              | 2      |
| SULNT12122 | 1.2      | 1.8          | 12               | 50          | 4              | 2      |
| SULNT14062 | 1.4      | 2.1          | 6                | 50          | 4              | 2      |
| SULNT14102 | 1.4      | 2.1          | 10               | 50          | 4              | 2      |
| SULNT14162 | 1.4      | 2.1          | 16               | 50          | 4              | 2      |
| SULNT15062 | 1.5      | 2.3          | 6                | 50          | 4              | 2      |
| SULNT15082 | 1.5      | 2.3          | 8                | 50          | 4              | 2      |
| SULNT15102 | 1.5      | 2.3          | 10               | 50          | 4              | 2      |
| SULNT15122 | 1.5      | 2.3          | 12               | 50          | 4              | 2      |
| SULNT15142 | 1.5      | 2.3          | 14               | 50          | 4              | 2      |
| SULNT15162 | 1.5      | 2.3          | 16               | 50          | 4              | 2      |
| SULNT15182 | 1.5      | 2.3          | 18               | 50          | 4              | 2      |
| SULNT15202 | 1.5      | 2.3          | 20               | 50          | 4              | 2      |
| SULNT16062 | 1.6      | 2.4          | 6                | 50          | 4              | 2      |
| SULNT16082 | 1.6      | 2.4          | 8                | 50          | 4              | 2      |
| SULNT16102 | 1.6      | 2.4          | 10               | 50          | 4              | 2      |
| SULNT16122 | 1.6      | 2.4          | 12               | 50          | 4              | 2      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
**P406**  
Cutting Condition

### Square Type - Long Neck - 2 flutes

## ■ 2刃深溝專用長頸立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|------------------|-------------|----------------|--------|
| 型號         | d 刃徑     | ℓ 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| SULNT16142 | 1.6      | 2.4          | 14               | 50          | 4              | 2      |
| SULNT16162 | 1.6      | 2.4          | 16               | 50          | 4              | 2      |
| SULNT16182 | 1.6      | 2.4          | 18               | 50          | 4              | 2      |
| SULNT18082 | 1.8      | 2.7          | 8                | 50          | 4              | 2      |
| SULNT18142 | 1.8      | 2.7          | 14               | 50          | 4              | 2      |
| SULNT18202 | 1.8      | 2.7          | 20               | 50          | 4              | 2      |
| SULNT20062 | 2        | 3            | 6                | 50          | 4              | 2      |
| SULNT20082 | 2        | 3            | 8                | 50          | 4              | 2      |
| SULNT20102 | 2        | 3            | 10               | 50          | 4              | 2      |
| SULNT20122 | 2        | 3            | 12               | 50          | 4              | 2      |
| SULNT20142 | 2        | 3            | 14               | 50          | 4              | 2      |
| SULNT20162 | 2        | 3            | 16               | 50          | 4              | 2      |
| SULNT20182 | 2        | 3            | 18               | 50          | 4              | 2      |
| SULNT20202 | 2        | 3            | 20               | 50          | 4              | 2      |
| SULNT25082 | 2.5      | 4            | 8                | 50          | 4              | 2      |
| SULNT25102 | 2.5      | 4            | 10               | 50          | 4              | 2      |
| SULNT25122 | 2.5      | 4            | 12               | 50          | 4              | 2      |
| SULNT25142 | 2.5      | 4            | 14               | 50          | 4              | 2      |
| SULNT25162 | 2.5      | 4            | 16               | 50          | 4              | 2      |
| SULNT25202 | 2.5      | 4            | 20               | 50          | 4              | 2      |
| SULNT30082 | 3        | 4.5          | 8                | 50          | 6              | 2      |
| SULNT30102 | 3        | 4.5          | 10               | 50          | 6              | 2      |
| SULNT30122 | 3        | 4.5          | 12               | 50          | 6              | 2      |
| SULNT30162 | 3        | 4.5          | 16               | 60          | 6              | 2      |
| SULNT30202 | 3        | 4.5          | 20               | 60          | 6              | 2      |
| SULNT30252 | 3        | 4.5          | 25               | 75          | 6              | 2      |
| SULNT35122 | 3.5      | 6            | 12               | 50          | 6              | 2      |
| SULNT35162 | 3.5      | 6            | 16               | 60          | 6              | 2      |
| SULNT35202 | 3.5      | 6            | 20               | 75          | 6              | 2      |
| SULNT35252 | 3.5      | 6            | 25               | 75          | 6              | 2      |
| SULNT35302 | 3.5      | 6            | 30               | 75          | 6              | 2      |
| SULNT40122 | 4        | 6            | 12               | 50          | 6              | 2      |
| SULNT40162 | 4        | 6            | 16               | 60          | 6              | 2      |
| SULNT40202 | 4        | 6            | 20               | 75          | 6              | 2      |
| SULNT40252 | 4        | 6            | 25               | 75          | 6              | 2      |
| SULNT40302 | 4        | 6            | 30               | 75          | 6              | 2      |
| SULNT40352 | 4        | 6            | 35               | 75          | 6              | 2      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P342**

### Fine Pitch Roughing Type - 3 flutes

## 3刃粗精銑刀

600  
Nano

HRC  
50

40°

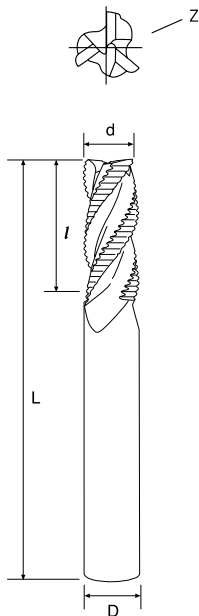
RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刀徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUNTA0403 | 4        | 8            | 50          | 6              | 3      |
| SUNTA0503 | 5        | 13           | 50          | 6              | 3      |
| SUNTA0603 | 6        | 16           | 50          | 6              | 3      |
| SUNTA0703 | 7        | 16           | 60          | 8              | 3      |
| SUNTA0803 | 8        | 19           | 60          | 8              | 3      |
| SUNTA0903 | 9        | 25           | 75          | 10             | 3      |
| SUNTA1003 | 10       | 25           | 75          | 10             | 3      |
| SUNTA1103 | 11       | 30           | 75          | 12             | 3      |
| SUNTA1203 | 12       | 30           | 75          | 12             | 3      |
| SUNTA1603 | 16       | 35           | 100         | 16             | 3      |
| SUNTA2003 | 20       | 45           | 100         | 20             | 3      |



- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50**
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ○                     |        | ○      |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P343**

## Fine Pitch & Roughing Type - 4 flutes

### 4刃粗精銑刀

600  
Nano

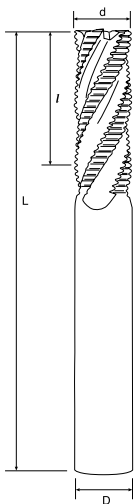
HRC  
50

40°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刀徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUNTA0504 | 5        | 13           | 50          | 6              | 4      |
| SUNTA0604 | 6        | 16           | 50          | 6              | 4      |
| SUNTA0704 | 7        | 16           | 60          | 8              | 4      |
| SUNTA0804 | 8        | 19           | 60          | 8              | 4      |
| SUNTA0904 | 9        | 25           | 75          | 10             | 4      |
| SUNTA1004 | 10       | 25           | 75          | 10             | 4      |
| SUNTA1104 | 11       | 30           | 75          | 12             | 4      |
| SUNTA1204 | 12       | 30           | 75          | 12             | 4      |
| SUNTA1404 | 14       | 35           | 100         | 16             | 4      |
| SUNTA1504 | 15       | 35           | 100         | 16             | 4      |
| SUNTA1604 | 16       | 35           | 100         | 16             | 4      |
| SUNTA2004 | 20       | 45           | 100         | 20             | 4      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表 **P344**  
Cutting Condition

## Roughing Type - 3 flutes

### 3刃粗銑刀

600  
Nano

HRC  
50

25°

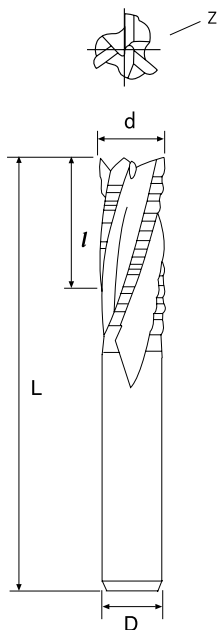
RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUXTA0403 | 4        | 8            | 50          | 6              | 3      |
| SUXTA0503 | 5        | 13           | 50          | 6              | 3      |
| SUXTA0603 | 6        | 16           | 50          | 6              | 3      |
| SUXTA0703 | 7        | 16           | 60          | 8              | 3      |
| SUXTA0803 | 8        | 19           | 60          | 8              | 3      |
| SUXTA0903 | 9        | 25           | 75          | 10             | 3      |
| SUXTA1003 | 10       | 25           | 75          | 10             | 3      |
| SUXTA1103 | 11       | 30           | 75          | 12             | 3      |
| SUXTA1203 | 12       | 30           | 75          | 12             | 3      |
| SUXTA1603 | 16       | 35           | 100         | 16             | 3      |
| SUXTA2003 | 20       | 45           | 100         | 20             | 3      |



- HRC > 40
- HRC > 45
- HRC > 50**
- HRC > 55
- HRC > 60
- HRC > 65
- Icon 1
- Icon 2
- Icon 3
- Icon 4
- Icon 5
- Icon 6
- Icon 7
- Icon 8
- Icon 9
- Icon 10

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC |                        |                        |                       |
| ◎  | ◎                         | ○                     |        | ○      | ◎                      | ○                      | ○                     |

Unit/單位: mm



切削  
條件表  
Cutting Condition

**P345**

## Roughing Type - 4 flutes

### ■ 4刃粗銑刀

600  
Nano

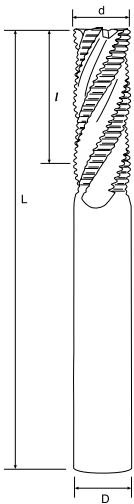
HRC  
50

25°

RS

Micro Grain Carbide

WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | ℓ 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUXTA0504 | 5        | 13           | 50          | 6              | 4      |
| SUXTA0604 | 6        | 16           | 50          | 6              | 4      |
| SUXTA0704 | 7        | 16           | 60          | 8              | 4      |
| SUXTA0804 | 8        | 19           | 60          | 8              | 4      |
| SUXTA0904 | 9        | 25           | 75          | 10             | 4      |
| SUXTA1004 | 10       | 25           | 75          | 10             | 4      |
| SUXTA1104 | 11       | 30           | 75          | 12             | 4      |
| SUXTA1204 | 12       | 30           | 75          | 12             | 4      |
| SUXTA1604 | 16       | 35           | 100         | 16             | 4      |
| SUXTA2004 | 20       | 45           | 100         | 20             | 4      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
P347-348  
Cutting Condition

### Miniature Ball Nose Type - 2 flutes

## 2刃微小徑球型立銑刀

600  
Nano

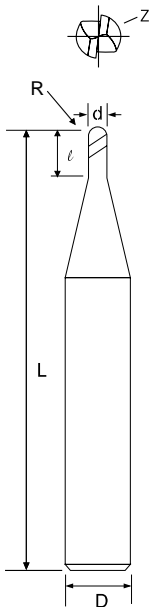
HRC  
50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE      | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------|----------|--------|--------------|-------------|----------------|--------|
| 型號        | d 刃徑     | R 值    | 刃長           | L 全長        | D 柄徑           | Z 刃數   |
| SUMIB0032 | 0.3      | 0.15   | 0.6          | 50          | 4              | 2      |
| SUMIB0042 | 0.4      | 0.2    | 0.7          | 50          | 4              | 2      |
| SUMIB0052 | 0.5      | 0.25   | 0.8          | 50          | 4              | 2      |
| SUMIB0062 | 0.6      | 0.3    | 0.9          | 50          | 4              | 2      |
| SUMIB0072 | 0.7      | 0.35   | 1.4          | 50          | 4              | 2      |
| SUMIB0082 | 0.8      | 0.4    | 1.6          | 50          | 4              | 2      |
| SUMIB0092 | 0.9      | 0.45   | 1.8          | 50          | 4              | 2      |
| SUMIB0102 | 1.0      | 0.5    | 2            | 50          | 4              | 2      |
| SUMIB0112 | 1.1      | 0.55   | 2.2          | 50          | 4              | 2      |
| SUMIB0122 | 1.2      | 0.6    | 2.4          | 50          | 4              | 2      |
| SUMIB0132 | 1.3      | 0.65   | 2.6          | 50          | 4              | 2      |
| SUMIB0142 | 1.4      | 0.7    | 2.8          | 50          | 4              | 2      |
| SUMIB0152 | 1.5      | 0.75   | 3            | 50          | 4              | 2      |
| SUMIB0162 | 1.6      | 0.8    | 3.2          | 50          | 4              | 2      |
| SUMIB0172 | 1.7      | 0.85   | 3.4          | 50          | 4              | 2      |
| SUMIB0182 | 1.8      | 0.9    | 3.6          | 50          | 4              | 2      |
| SUMIB0192 | 1.9      | 0.95   | 3.8          | 50          | 4              | 2      |
| SUMIB0202 | 2.0      | 1      | 4            | 50          | 4              | 2      |
| SUMIB0212 | 2.1      | 1.05   | 4.2          | 50          | 4              | 2      |
| SUMIB0222 | 2.2      | 1.1    | 4.4          | 50          | 4              | 2      |
| SUMIB0232 | 2.3      | 1.15   | 4.6          | 50          | 4              | 2      |
| SUMIB0242 | 2.4      | 1.2    | 4.8          | 50          | 4              | 2      |
| SUMIB0252 | 2.5      | 1.25   | 5            | 50          | 4              | 2      |
| SUMIB0262 | 2.6      | 1.3    | 5.2          | 50          | 4              | 2      |
| SUMIB0272 | 2.7      | 1.35   | 5.4          | 50          | 4              | 2      |
| SUMIB0282 | 2.8      | 1.4    | 5.6          | 50          | 4              | 2      |
| SUMIB0292 | 2.9      | 1.45   | 5.8          | 50          | 4              | 2      |
| SUMIB0302 | 3.0      | 1.5    | 6            | 50          | 4              | 2      |

- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
P347-348  
Cutting Condition

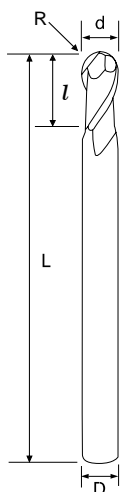
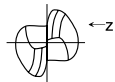
## Ball Nose Type - 2 flutes

### 2刃球型立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUBT0102 | 1        | 0.5    | 2            | 50          | 6              | 2      |
| SUBT3102 | 1        | 0.5    | 2            | 50          | 3              | 2      |
| SUBT4102 | 1        | 0.5    | 2            | 50          | 4              | 2      |
| SUBT0152 | 1.5      | 0.75   | 3            | 50          | 6              | 2      |
| SUBT3152 | 1.5      | 0.75   | 3            | 50          | 3              | 2      |
| SUBT4152 | 1.5      | 0.75   | 3            | 50          | 4              | 2      |
| SUBT0202 | 2        | 1      | 4            | 50          | 6              | 2      |
| SUBT3202 | 2        | 1      | 4            | 50          | 3              | 2      |
| SUBT4202 | 2        | 1      | 4            | 50          | 4              | 2      |
| SUBT0252 | 2.5      | 1.25   | 5            | 50          | 6              | 2      |
| SUBT3252 | 2.5      | 1.25   | 5            | 50          | 3              | 2      |
| SUBT4252 | 2.5      | 1.25   | 5            | 50          | 4              | 2      |
| SUBT0302 | 3        | 1.5    | 6            | 50          | 6              | 2      |
| SUBT3302 | 3        | 1.5    | 6            | 50          | 3              | 2      |
| SUBT4302 | 3        | 1.5    | 6            | 50          | 4              | 2      |
| SUBT0352 | 3.5      | 1.75   | 7            | 50          | 6              | 2      |
| SUBT4352 | 3.5      | 1.75   | 7            | 50          | 4              | 2      |
| SUBT0402 | 4        | 2      | 8            | 50          | 6              | 2      |
| SUBT4402 | 4        | 2      | 8            | 50          | 4              | 2      |
| SUBT0452 | 4.5      | 2.25   | 9            | 50          | 6              | 2      |
| SUBT0502 | 5        | 2.5    | 10           | 50          | 6              | 2      |
| SUBT0552 | 5.5      | 2.75   | 11           | 50          | 6              | 2      |
| SUBT0602 | 6        | 3      | 12           | 50          | 6              | 2      |
| SUBT0702 | 7        | 3.5    | 14           | 60          | 8              | 2      |
| SUBT0802 | 8        | 4      | 16           | 60          | 8              | 2      |
| SUBT0902 | 9        | 4.5    | 18           | 75          | 10             | 2      |
| SUBT1002 | 10       | 5      | 20           | 75          | 10             | 2      |
| SUBT1102 | 11       | 5.5    | 22           | 75          | 12             | 2      |
| SUBT1202 | 12       | 6      | 24           | 75          | 12             | 2      |
| SUBT1402 | 14       | 7      | 28           | 100         | 16             | 2      |
| SUBT1602 | 16       | 8      | 32           | 100         | 16             | 2      |
| SUBT1802 | 18       | 9      | 36           | 100         | 20             | 2      |
| SUBT2002 | 20       | 10     | 40           | 100         | 20             | 2      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P421**

## Ball Nose Type - 4 flutes

### 4刃球型立銑刀

600  
Nano

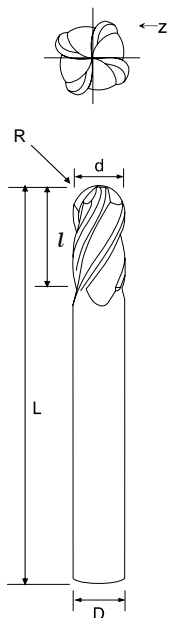
HRC  
50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE     | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------|--------------|-------------|----------------|--------|
| 型號       | d 刃徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUBT0104 | 1        | 0.5    | 2            | 50          | 6              | 4      |
| SUBT4104 | 1        | 0.5    | 2            | 50          | 4              | 4      |
| SUBT0154 | 1.5      | 0.75   | 3            | 50          | 6              | 4      |
| SUBT4154 | 1.5      | 0.75   | 3            | 50          | 4              | 4      |
| SUBT0204 | 2        | 1      | 4            | 50          | 6              | 4      |
| SUBT4204 | 2        | 1      | 4            | 50          | 4              | 4      |
| SUBT0254 | 2.5      | 1.25   | 5            | 50          | 6              | 4      |
| SUBT4254 | 2.5      | 1.25   | 5            | 50          | 4              | 4      |
| SUBT0304 | 3        | 1.5    | 6            | 50          | 6              | 4      |
| SUBT3304 | 3        | 1.5    | 6            | 50          | 3              | 4      |
| SUBT4304 | 3        | 1.5    | 6            | 50          | 4              | 4      |
| SUBT0354 | 3.5      | 1.75   | 7            | 50          | 6              | 4      |
| SUBT4354 | 3.5      | 1.75   | 7            | 50          | 4              | 4      |
| SUBT0404 | 4        | 2      | 8            | 50          | 6              | 4      |
| SUBT4404 | 4        | 2      | 8            | 50          | 4              | 4      |
| SUBT0454 | 4.5      | 2.25   | 9            | 50          | 6              | 4      |
| SUBT0504 | 5        | 2.5    | 10           | 50          | 6              | 4      |
| SUBT0554 | 5.5      | 2.75   | 11           | 50          | 6              | 4      |
| SUBT0604 | 6        | 3      | 12           | 50          | 6              | 4      |
| SUBT0704 | 7        | 3.5    | 14           | 60          | 8              | 4      |
| SUBT0804 | 8        | 4      | 16           | 60          | 8              | 4      |
| SUBT0904 | 9        | 4.5    | 18           | 75          | 10             | 4      |
| SUBT1004 | 10       | 5      | 20           | 75          | 10             | 4      |
| SUBT1104 | 11       | 5.5    | 22           | 75          | 12             | 4      |
| SUBT1204 | 12       | 6      | 24           | 75          | 12             | 4      |
| SUBT1404 | 14       | 7      | 28           | 100         | 16             | 4      |
| SUBT1604 | 16       | 8      | 32           | 100         | 16             | 4      |
| SUBT1804 | 18       | 9      | 36           | 100         | 20             | 4      |
| SUBT2004 | 20       | 10     | 40           | 100         | 20             | 4      |

- HRC > 40
- HRC > 45
- HRC > 50**
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
**P347-348**  
 Cutting Condition

## Ball Nose Type - Long Shank - 2 flutes

### 2刃長柄球型立銑刀

600  
Nano

HRC  
50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------|--------------|-------------|----------------|--------|
| 型號         | d 刃徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SULBTS0102 | 1        | 0.5    | 2            | 75          | 6              | 2      |
| SULBTM0102 | 1        | 0.5    | 2            | 100         | 6              | 2      |
| SULBTS0152 | 1.5      | 0.75   | 3            | 75          | 6              | 2      |
| SULBTM0152 | 1.5      | 0.75   | 3            | 100         | 6              | 2      |
| SULBTS0202 | 2        | 1      | 4            | 75          | 6              | 2      |
| SULBTM0202 | 2        | 1      | 4            | 100         | 6              | 2      |
| SULBTS0252 | 2.5      | 1.25   | 5            | 75          | 6              | 2      |
| SULBTM0252 | 2.5      | 1.25   | 5            | 100         | 6              | 2      |
| SULBTS0302 | 3        | 1.5    | 6            | 75          | 6              | 2      |
| SULBTM0302 | 3        | 1.5    | 6            | 100         | 6              | 2      |
| SULBTS0352 | 3.5      | 1.75   | 7            | 100         | 6              | 2      |
| SULBTS0402 | 4        | 2      | 8            | 75          | 6              | 2      |
| SULBTM0402 | 4        | 2      | 8            | 100         | 6              | 2      |
| SULBTS0502 | 5        | 2.5    | 10           | 75          | 6              | 2      |
| SULBTM0502 | 5        | 2.5    | 10           | 100         | 6              | 2      |
| SULBTS0602 | 6        | 3      | 12           | 75          | 6              | 2      |
| SULBTM0602 | 6        | 3      | 12           | 100         | 6              | 2      |
| SULBTL0602 | 6        | 3      | 12           | 150         | 6              | 2      |
| SULBTS0802 | 8        | 4      | 16           | 75          | 8              | 2      |
| SULBTM0802 | 8        | 4      | 16           | 100         | 8              | 2      |
| SULBTL0802 | 8        | 4      | 16           | 150         | 8              | 2      |
| SULBTL1002 | 10       | 5      | 20           | 150         | 10             | 2      |
| SULBTL1002 | 10       | 5      | 20           | 200         | 10             | 2      |
| SULBTM1202 | 12       | 6      | 24           | 100         | 12             | 2      |
| SULBTL1202 | 12       | 6      | 24           | 150         | 12             | 2      |
| SULBTM1202 | 12       | 6      | 24           | 200         | 12             | 2      |
| SULBTL1602 | 16       | 8      | 32           | 150         | 16             | 2      |
| SULBTM1602 | 16       | 8      | 32           | 200         | 16             | 2      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P407**

## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀

600 Nano

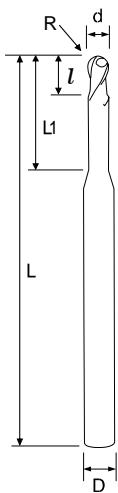
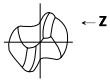
HRC > 50

35°

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|--------|--------------|------------------|-------------|----------------|--------|
| 型號          | d 刃徑     | R 值    | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| SULNBT05022 | 0.5      | 0.25   | 0.75         | 2                | 50          | 4              | 2      |
| SULNBT05042 | 0.5      | 0.25   | 0.75         | 4                | 50          | 4              | 2      |
| SULNBT05062 | 0.5      | 0.25   | 0.75         | 6                | 50          | 4              | 2      |
| SULNBT06022 | 0.6      | 0.3    | 0.9          | 2                | 50          | 4              | 2      |
| SULNBT06042 | 0.6      | 0.3    | 0.9          | 4                | 50          | 4              | 2      |
| SULNBT06062 | 0.6      | 0.3    | 0.9          | 6                | 50          | 4              | 2      |
| SULNBT08042 | 0.8      | 0.4    | 1.2          | 4                | 50          | 4              | 2      |
| SULNBT08062 | 0.8      | 0.4    | 1.2          | 6                | 50          | 4              | 2      |
| SULNBT08082 | 0.8      | 0.4    | 1.2          | 8                | 50          | 4              | 2      |
| SULNBT10062 | 1        | 0.5    | 1.5          | 6                | 50          | 4              | 2      |
| SULNBT10082 | 1        | 0.5    | 1.5          | 8                | 50          | 4              | 2      |
| SULNBT10102 | 1        | 0.5    | 1.5          | 10               | 50          | 4              | 2      |
| SULNBT10122 | 1        | 0.5    | 1.5          | 12               | 50          | 4              | 2      |
| SULNBT12062 | 1.2      | 0.6    | 1.8          | 6                | 50          | 4              | 2      |
| SULNBT12082 | 1.2      | 0.6    | 1.8          | 8                | 50          | 4              | 2      |
| SULNBT12102 | 1.2      | 0.6    | 1.8          | 10               | 50          | 4              | 2      |
| SULNBT12122 | 1.2      | 0.6    | 1.8          | 12               | 50          | 4              | 2      |
| SULNBT14062 | 1.4      | 0.7    | 2.1          | 6                | 50          | 4              | 2      |
| SULNBT14102 | 1.4      | 0.7    | 2.1          | 10               | 50          | 4              | 2      |
| SULNBT14162 | 1.4      | 0.7    | 2.1          | 16               | 50          | 4              | 2      |
| SULNBT15062 | 1.5      | 0.75   | 2.3          | 6                | 50          | 4              | 2      |
| SULNBT15082 | 1.5      | 0.75   | 2.3          | 8                | 50          | 4              | 2      |
| SULNBT15102 | 1.5      | 0.75   | 2.3          | 10               | 50          | 4              | 2      |
| SULNBT15122 | 1.5      | 0.75   | 2.3          | 12               | 50          | 4              | 2      |
| SULNBT15142 | 1.5      | 0.75   | 2.3          | 14               | 50          | 4              | 2      |
| SULNBT15162 | 1.5      | 0.75   | 2.3          | 16               | 50          | 4              | 2      |
| SULNBT15182 | 1.5      | 0.75   | 2.3          | 18               | 50          | 4              | 2      |
| SULNBT15202 | 1.5      | 0.75   | 2.3          | 20               | 50          | 4              | 2      |
| SULNBT16062 | 1.6      | 0.8    | 2.4          | 6                | 50          | 4              | 2      |
| SULNBT16082 | 1.6      | 0.8    | 2.4          | 8                | 50          | 4              | 2      |

- HRC > 40
- HRC > 45
- HRC > 50**
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P407**

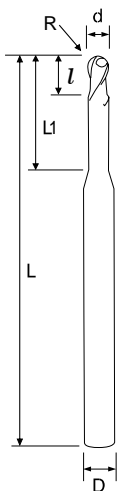
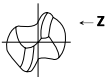
## Ball Nose Type - Long Neck - 2 flutes

### 2刃深溝長頸球型立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|-------------|----------|--------|--------------|------------------|-------------|----------------|--------|
| 型號          | d 刃徑     | R 值    | l 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| SULNBT16102 | 1.6      | 0.8    | 2.4          | 10               | 50          | 4              | 2      |
| SULNBT16122 | 1.6      | 0.8    | 2.4          | 12               | 50          | 4              | 2      |
| SULNBT16142 | 1.6      | 0.8    | 2.4          | 14               | 50          | 4              | 2      |
| SULNBT16162 | 1.6      | 0.8    | 2.4          | 16               | 50          | 4              | 2      |
| SULNBT16182 | 1.6      | 0.8    | 2.4          | 18               | 50          | 4              | 2      |
| SULNBT16202 | 1.6      | 0.8    | 2.4          | 20               | 50          | 4              | 2      |
| SULNBT18082 | 1.8      | 0.9    | 2.7          | 8                | 50          | 4              | 2      |
| SULNBT18142 | 1.8      | 0.9    | 2.7          | 14               | 50          | 4              | 2      |
| SULNBT18202 | 1.8      | 0.9    | 2.7          | 20               | 50          | 4              | 2      |
| SULNBT20082 | 2        | 1      | 3            | 8                | 50          | 4              | 2      |
| SULNBT20102 | 2        | 1      | 3            | 10               | 50          | 4              | 2      |
| SULNBT20122 | 2        | 1      | 3            | 12               | 50          | 4              | 2      |
| SULNBT20142 | 2        | 1      | 3            | 14               | 50          | 4              | 2      |
| SULNBT20162 | 2        | 1      | 3            | 16               | 50          | 4              | 2      |
| SULNBT20182 | 2        | 1      | 3            | 18               | 50          | 4              | 2      |
| SULNBT20202 | 2        | 1      | 3            | 20               | 50          | 4              | 2      |
| SULNBT25082 | 2.5      | 1.25   | 4            | 8                | 50          | 4              | 2      |
| SULNBT25122 | 2.5      | 1.25   | 4            | 12               | 50          | 4              | 2      |
| SULNBT25162 | 2.5      | 1.25   | 4            | 16               | 50          | 4              | 2      |
| SULNBT25202 | 2.5      | 1.25   | 4            | 20               | 50          | 4              | 2      |
| SULNBT30102 | 3        | 1.5    | 4.5          | 10               | 50          | 6              | 2      |
| SULNBT30122 | 3        | 1.5    | 4.5          | 12               | 50          | 6              | 2      |
| SULNBT30162 | 3        | 1.5    | 4.5          | 16               | 60          | 6              | 2      |
| SULNBT30202 | 3        | 1.5    | 4.5          | 20               | 60          | 6              | 2      |
| SULNBT30252 | 3        | 1.5    | 4.5          | 25               | 75          | 6              | 2      |
| SULNBT40122 | 4        | 2      | 6            | 12               | 50          | 6              | 2      |
| SULNBT40162 | 4        | 2      | 6            | 16               | 60          | 6              | 2      |
| SULNBT40202 | 4        | 2      | 6            | 20               | 75          | 6              | 2      |
| SULNBT40252 | 4        | 2      | 6            | 25               | 75          | 6              | 2      |
| SULNBT40302 | 4        | 2      | 6            | 30               | 75          | 6              | 2      |



Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------|-----------------------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎      | ○                     |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P422**

## Corner Radius Type - 3 flutes

### 3刃圓鼻立銑刀

600 Nano

HRC > 50

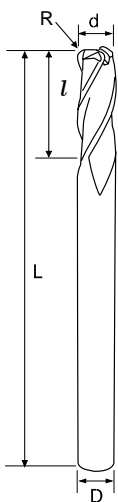
30°

R

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE         | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|--------------|----------|---------------|--------------|-------------|----------------|--------|
| 型號           | d 刀徑     | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SURTA0200203 | 2        | 0.2           | 6            | 50          | 4              | 3      |
| SURTA0200253 | 2        | 0.25          | 6            | 50          | 4              | 3      |
| SURTA0200303 | 2        | 0.3           | 6            | 50          | 4              | 3      |
| SURTA0200503 | 2        | 0.5           | 6            | 50          | 4              | 3      |
| SURTA0300203 | 3        | 0.2           | 10           | 50          | 3              | 3      |
| SURTA0300303 | 3        | 0.3           | 10           | 50          | 3              | 3      |
| SURTA0300503 | 3        | 0.5           | 10           | 50          | 3              | 3      |
| SURTA0301003 | 3        | 1             | 10           | 50          | 3              | 3      |
| SURTA4300203 | 3        | 0.2           | 10           | 50          | 4              | 3      |
| SURTA4300253 | 3        | 0.25          | 10           | 50          | 4              | 3      |
| SURTA4300303 | 3        | 0.3           | 10           | 50          | 4              | 3      |
| SURTA4300503 | 3        | 0.5           | 10           | 50          | 4              | 3      |
| SURTA4300753 | 3        | 0.75          | 10           | 50          | 4              | 3      |
| SURTA4301003 | 3        | 1             | 10           | 50          | 4              | 3      |
| SURTA0400203 | 4        | 0.2           | 13           | 60          | 4              | 3      |
| SURTA0400253 | 4        | 0.25          | 13           | 60          | 4              | 3      |
| SURTA0400303 | 4        | 0.3           | 13           | 60          | 4              | 3      |
| SURTA0400503 | 4        | 0.5           | 13           | 60          | 4              | 3      |
| SURTA0400753 | 4        | 0.75          | 13           | 60          | 4              | 3      |
| SURTA0401003 | 4        | 1             | 13           | 60          | 4              | 3      |
| SURTA0500203 | 5        | 0.2           | 15           | 60          | 5              | 3      |
| SURTA0500253 | 5        | 0.25          | 15           | 60          | 5              | 3      |
| SURTA0500303 | 5        | 0.3           | 15           | 60          | 5              | 3      |
| SURTA0500503 | 5        | 0.5           | 15           | 60          | 5              | 3      |
| SURTA0500753 | 5        | 0.75          | 15           | 60          | 5              | 3      |
| SURTA0501003 | 5        | 1             | 15           | 60          | 5              | 3      |
| SURTA0600203 | 6        | 0.2           | 16           | 70          | 6              | 3      |
| SURTA0600253 | 6        | 0.25          | 16           | 70          | 6              | 3      |
| SURTA0600303 | 6        | 0.3           | 16           | 70          | 6              | 3      |

- HRC > 40
- HRC > 45
- HRC > 50**
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm



切削條件表  
Cutting Condition  
**P422**

## Corner Radius Type - 3 flutes

### 3刃圓鼻立銑刀

600 Nano

HRC > 50

30°

R

RS

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE         | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|--------------|----------|---------------|--------------|-------------|----------------|--------|
| 型號           | d 刀徑     | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SURTA0600503 | 6        | 0.5           | 16           | 70          | 6              | 3      |
| SURTA0600753 | 6        | 0.75          | 16           | 70          | 6              | 3      |
| SURTA0601003 | 6        | 1             | 16           | 70          | 6              | 3      |
| SURTA0601253 | 6        | 1.25          | 16           | 70          | 6              | 3      |
| SURTA0601503 | 6        | 1.5           | 16           | 70          | 6              | 3      |
| SURTA0800253 | 8        | 0.25          | 23           | 70          | 8              | 3      |
| SURTA0800303 | 8        | 0.3           | 23           | 70          | 8              | 3      |
| SURTA0800503 | 8        | 0.5           | 23           | 70          | 8              | 3      |
| SURTA0800753 | 8        | 0.75          | 23           | 70          | 8              | 3      |
| SURTA0801003 | 8        | 1             | 23           | 70          | 8              | 3      |
| SURTA0801253 | 8        | 1.25          | 23           | 70          | 8              | 3      |
| SURTA0801503 | 8        | 1.5           | 23           | 70          | 8              | 3      |
| SURTA0802003 | 8        | 2             | 23           | 70          | 8              | 3      |
| SURTA1000253 | 10       | 0.25          | 25           | 80          | 10             | 3      |
| SURTA1000303 | 10       | 0.3           | 25           | 80          | 10             | 3      |
| SURTA1000503 | 10       | 0.5           | 25           | 80          | 10             | 3      |
| SURTA1000753 | 10       | 0.75          | 25           | 80          | 10             | 3      |
| SURTA1001003 | 10       | 1             | 25           | 80          | 10             | 3      |
| SURTA1001253 | 10       | 1.25          | 25           | 80          | 10             | 3      |
| SURTA1001503 | 10       | 1.5           | 25           | 80          | 10             | 3      |
| SURTA1002003 | 10       | 2             | 25           | 80          | 10             | 3      |
| SURTA1002503 | 10       | 2.5           | 25           | 80          | 10             | 3      |
| SURTA1200303 | 12       | 0.3           | 30           | 80          | 12             | 3      |
| SURTA1200503 | 12       | 0.5           | 30           | 80          | 12             | 3      |
| SURTA1201003 | 12       | 1             | 30           | 80          | 12             | 3      |
| SURTA1201253 | 12       | 1.25          | 30           | 80          | 12             | 3      |
| SURTA1201503 | 12       | 1.5           | 30           | 80          | 12             | 3      |
| SURTA1202003 | 12       | 2             | 30           | 80          | 12             | 3      |
| SURTA1202503 | 12       | 2.5           | 30           | 80          | 12             | 3      |
| SURTA1203003 | 12       | 3             | 30           | 80          | 12             | 3      |

HRC > 40

HRC > 45

HRC > 50

HRC > 55

HRC > 60

HRC > 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ◎                      | ○                      | ○                     |

Unit/單位: mm



**UMG-FHPS**  
**UMG-FHP**  
**UMG-FHPM**  
**UMG-FHPL**  
**UMG-CR-FHP**

**FULGURITE AND  
HIGH SPEED MILLING AND  
POEWRFUL**

# FULGURITE AND HIGH SPEED MILLING AND POWERFUL

- I UMG-FHPS
- I UMG-FHP
- I UMG-CR-FHP

刀徑容許公差 0 ~ -0.02mm

Tool diameter tolerance 0 ~ -0.02mm for all size

奈米超硬底材、驚異高抗損性、優異耐磨耗性

Superior wear and chipping resistance due to optimally matched coating and carbide material

刀刃平順光滑

Smooth radiul relief

## 多機能

高速溝加工及超高速側面加工  
高精度加工一次完成

## 優異的切削排出性

切削排出性高  
特殊溝形狀採用  
四枚刀溝重切削實現

## 高剛性

獨自的溝形狀應用  
大幅度的高剛性設計  
抗折損強度大幅提昇



長壽命

Long tool life

高效能

High efficient

高精度

High accuracy

優異新刃形採用

A new geomatry is adopted to ensure rigidity

**Upgrade**

Anti-Vibration Design  
升級款-抗震刀型



Unequal Helix Angle  
不等螺旋



Unequal Flute Spacing  
不等分割

切削條件表 **P423-424**  
Cutting Condition

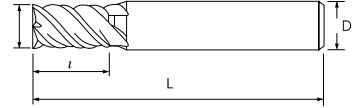
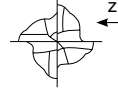
## FHP Type - Short Flute - 4 flutes

### ■ 4刃重切削立銑刀

**400** Nano **HRC** ▶ 60 **ALTiBN**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : FHP5020.A  
 採購代碼

#### UMG - FHPS

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 2            | 3            | 50          | 6              | 4      | FHPS020            | FHPS020.A                  |
| 2.1          | 3.2          | 50          | 6              | 4      | FHPS021            | FHPS021.A                  |
| 2.2          | 3.3          | 50          | 6              | 4      | FHPS022            | FHPS022.A                  |
| 2.3          | 3.5          | 50          | 6              | 4      | FHPS023            | FHPS023.A                  |
| 2.4          | 3.6          | 50          | 6              | 4      | FHPS024            | FHPS024.A                  |
| 2.5          | 3.8          | 50          | 6              | 4      | FHPS025            | FHPS025.A                  |
| 2.6          | 3.9          | 50          | 6              | 4      | FHPS026            | FHPS026.A                  |
| 2.7          | 4.1          | 50          | 6              | 4      | FHPS027            | FHPS027.A                  |
| 2.8          | 4.2          | 50          | 6              | 4      | FHPS028            | FHPS028.A                  |
| 2.9          | 4.4          | 50          | 6              | 4      | FHPS029            | FHPS029.A                  |
| 3            | 4.5          | 50          | 6              | 4      | FHPS030            | FHPS030.A                  |
| 3.1          | 4.7          | 50          | 6              | 4      | FHPS031            | FHPS031.A                  |
| 3.2          | 4.8          | 50          | 6              | 4      | FHPS032            | FHPS032.A                  |
| 3.3          | 5            | 50          | 6              | 4      | FHPS033            | FHPS033.A                  |
| 3.4          | 5.1          | 50          | 6              | 4      | FHPS034            | FHPS034.A                  |
| 3.5          | 5.3          | 50          | 6              | 4      | FHPS035            | FHPS035.A                  |
| 3.6          | 5.4          | 50          | 6              | 4      | FHPS036            | FHPS036.A                  |
| 3.7          | 5.6          | 50          | 6              | 4      | FHPS037            | FHPS037.A                  |
| 3.8          | 5.7          | 50          | 6              | 4      | FHPS038            | FHPS038.A                  |
| 3.9          | 5.9          | 50          | 6              | 4      | FHPS039            | FHPS039.A                  |
| 4            | 6            | 50          | 6              | 4      | FHPS040            | FHPS040.A                  |
| 4.1          | 6.2          | 50          | 6              | 4      | FHPS041            | FHPS041.A                  |
| 4.2          | 6.3          | 50          | 6              | 4      | FHPS042            | FHPS042.A                  |
| 4.3          | 6.5          | 50          | 6              | 4      | FHPS043            | FHPS043.A                  |
| 4.4          | 6.6          | 50          | 6              | 4      | FHPS044            | FHPS044.A                  |
| 4.5          | 6.8          | 50          | 6              | 4      | FHPS045            | FHPS045.A                  |
| 4.6          | 6.9          | 50          | 6              | 4      | FHPS046            | FHPS046.A                  |
| 4.7          | 7.1          | 50          | 6              | 4      | FHPS047            | FHPS047.A                  |
| 4.8          | 7.2          | 50          | 6              | 4      | FHPS048            | FHPS048.A                  |
| 4.9          | 7.4          | 50          | 6              | 4      | FHPS049            | FHPS049.A                  |
| 5            | 7.5          | 50          | 6              | 4      | FHPS050            | FHPS050.A                  |
| 5.1          | 7.7          | 50          | 6              | 4      | FHPS051            | FHPS051.A                  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm

切削條件表 **P423-424**  
Cutting Condition

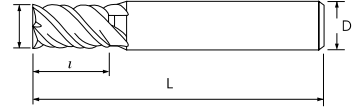
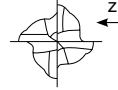
## FHP Type - Short Flute - 4 flutes

### 4刃短刃重切削立銑刀

**400** Nano **HRC** ▶ 60 **ALTIBN**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : FHP052.A  
 採購代碼

| UMG - FHPS   |              |             |                |        | Purchase Code 採購代碼         |           |
|--------------|--------------|-------------|----------------|--------|----------------------------|-----------|
| Dimension 規格 |              |             |                |        | Standard Type 標準刀型         |           |
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Anti-Vibration Design 抗震刀型 |           |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                            |           |
| 5.2          | 7.8          | 50          | 6              | 4      | FHPS052                    | FHPS052.A |
| 5.3          | 8            | 50          | 6              | 4      | FHPS053                    | FHPS053.A |
| 5.4          | 8.1          | 50          | 6              | 4      | FHPS054                    | FHPS054.A |
| 5.5          | 8.3          | 50          | 6              | 4      | FHPS055                    | FHPS055.A |
| 5.6          | 8.4          | 50          | 6              | 4      | FHPS056                    | FHPS056.A |
| 5.7          | 8.6          | 50          | 6              | 4      | FHPS057                    | FHPS057.A |
| 5.8          | 8.7          | 50          | 6              | 4      | FHPS058                    | FHPS058.A |
| 5.9          | 8.9          | 50          | 6              | 4      | FHPS059                    | FHPS059.A |
| 6            | 9            | 50          | 6              | 4      | FHPS060                    | FHPS060.A |
| 6.1          | 9.2          | 60          | 8              | 4      | FHPS061                    | FHPS061.A |
| 6.2          | 9.3          | 60          | 8              | 4      | FHPS062                    | FHPS062.A |
| 6.3          | 9.5          | 60          | 8              | 4      | FHPS063                    | FHPS063.A |
| 6.4          | 9.6          | 60          | 8              | 4      | FHPS064                    | FHPS064.A |
| 6.5          | 9.8          | 60          | 8              | 4      | FHPS065                    | FHPS065.A |
| 6.6          | 9.9          | 60          | 8              | 4      | FHPS066                    | FHPS066.A |
| 6.7          | 10.1         | 60          | 8              | 4      | FHPS067                    | FHPS067.A |
| 6.8          | 10.2         | 60          | 8              | 4      | FHPS068                    | FHPS068.A |
| 6.9          | 10.4         | 60          | 8              | 4      | FHPS069                    | FHPS069.A |
| 7            | 10.5         | 60          | 8              | 4      | FHPS070                    | FHPS070.A |
| 7.1          | 10.7         | 60          | 8              | 4      | FHPS071                    | FHPS071.A |
| 7.2          | 10.8         | 60          | 8              | 4      | FHPS072                    | FHPS072.A |
| 7.3          | 11           | 60          | 8              | 4      | FHPS073                    | FHPS073.A |
| 7.4          | 11.1         | 60          | 8              | 4      | FHPS074                    | FHPS074.A |
| 7.5          | 11.3         | 60          | 8              | 4      | FHPS075                    | FHPS075.A |
| 7.6          | 11.4         | 60          | 8              | 4      | FHPS076                    | FHPS076.A |
| 7.7          | 11.6         | 60          | 8              | 4      | FHPS077                    | FHPS077.A |
| 7.8          | 11.7         | 60          | 8              | 4      | FHPS078                    | FHPS078.A |
| 7.9          | 11.9         | 60          | 8              | 4      | FHPS079                    | FHPS079.A |
| 8            | 12           | 60          | 8              | 4      | FHPS080                    | FHPS080.A |
| 8.1          | 12.2         | 75          | 10             | 4      | FHPS081                    | FHPS081.A |
| 8.2          | 12.3         | 75          | 10             | 4      | FHPS082                    | FHPS082.A |
| 8.3          | 12.5         | 75          | 10             | 4      | FHPS083                    | FHPS083.A |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|---------------------|--------------------|
|                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                     |                    |
| ◎                                  | ◎                      | ◎                  | ○      | ○      |        |                     |                     |                    |

Unit/單位: mm

切削條件表 **P423-424**  
Cutting Condition

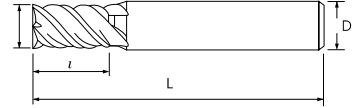
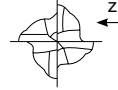
## FHP Type - Short Flute - 4 flutes

### 4刃短刃重切削立銑刀

**400** Nano **HRC** ▶ 60 **ALTiBN**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : FHP5020.A  
 採購代碼

#### UMG - FHPS

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 8.4          | 12.6         | 75          | 10             | 4      | FHPS084            | FHPS084.A                  |
| 8.5          | 12.8         | 75          | 10             | 4      | FHPS085            | FHPS085.A                  |
| 8.6          | 12.9         | 75          | 10             | 4      | FHPS086            | FHPS086.A                  |
| 8.7          | 13.1         | 75          | 10             | 4      | FHPS087            | FHPS087.A                  |
| 8.8          | 13.2         | 75          | 10             | 4      | FHPS088            | FHPS088.A                  |
| 8.9          | 13.4         | 75          | 10             | 4      | FHPS089            | FHPS089.A                  |
| 9            | 13.5         | 75          | 10             | 4      | FHPS090            | FHPS090.A                  |
| 9.1          | 13.7         | 75          | 10             | 4      | FHPS091            | FHPS091.A                  |
| 9.2          | 13.8         | 75          | 10             | 4      | FHPS092            | FHPS092.A                  |
| 9.3          | 14           | 75          | 10             | 4      | FHPS093            | FHPS093.A                  |
| 9.4          | 14.1         | 75          | 10             | 4      | FHPS094            | FHPS094.A                  |
| 9.5          | 14.3         | 75          | 10             | 4      | FHPS095            | FHPS095.A                  |
| 9.6          | 14.4         | 75          | 10             | 4      | FHPS096            | FHPS096.A                  |
| 9.7          | 14.6         | 75          | 10             | 4      | FHPS097            | FHPS097.A                  |
| 9.8          | 14.7         | 75          | 10             | 4      | FHPS098            | FHPS098.A                  |
| 9.9          | 14.9         | 75          | 10             | 4      | FHPS099            | FHPS099.A                  |
| 10           | 15           | 75          | 10             | 4      | FHPS100            | FHPS100.A                  |
| 10.5         | 15.8         | 100         | 12             | 4      | FHPS105            | FHPS105.A                  |
| 11           | 16.5         | 100         | 12             | 4      | FHPS110            | FHPS110.A                  |
| 11.5         | 17.3         | 100         | 12             | 4      | FHPS115            | FHPS115.A                  |
| 12           | 18           | 100         | 12             | 4      | FHPS120            | FHPS120.A                  |
| 12.5         | 18.8         | 100         | 14             | 4      | FHPS125            | FHPS125.A                  |
| 13           | 19.5         | 100         | 14             | 4      | FHPS130            | FHPS130.A                  |
| 13.5         | 20.3         | 100         | 14             | 4      | FHPS135            | FHPS135.A                  |
| 14           | 21           | 100         | 14             | 4      | FHPS140            | FHPS140.A                  |
| 14.5         | 21.8         | 100         | 16             | 4      | FHPS145            | FHPS145.A                  |
| 15           | 22.5         | 100         | 16             | 4      | FHPS150            | FHPS150.A                  |
| 15.5         | 23.3         | 100         | 16             | 4      | FHPS155            | FHPS155.A                  |
| 16           | 24           | 100         | 16             | 4      | FHPS160            | FHPS160.A                  |
| 17           | 25.5         | 100         | 20             | 4      | FHPS170            | FHPS170.A                  |
| 18           | 27           | 100         | 20             | 4      | FHPS180            | FHPS180.A                  |
| 19           | 28.5         | 100         | 20             | 4      | FHPS190            | FHPS190.A                  |
| 20           | 30           | 100         | 20             | 4      | FHPS200            | FHPS200.A                  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm

切削條件表 **P423-424**  
Cutting Condition

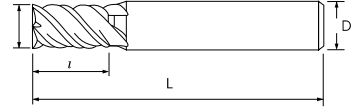
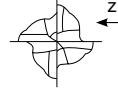
## FHP Type - Short Flute - 4 flutes

### 4刃短刃重切削立銑刀

**400** Nano **HRC** ▶ 60 **ALTIBN**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code 採購代碼 : FHP030.A

| UMG - FHP    |              |             |                |        | Purchase Code 採購代碼         |          |
|--------------|--------------|-------------|----------------|--------|----------------------------|----------|
| Dimension 規格 |              |             |                |        | Standard Type 標準刀型         |          |
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Anti-Vibration Design 抗震刀型 |          |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                            |          |
| 3            | 8            | 60          | 6              | 4      | FHP030                     | FHP030.A |
| 4            | 11           | 60          | 6              | 4      | FHP040                     | FHP040.A |
| 5            | 13           | 60          | 6              | 4      | FHP050                     | FHP050.A |
| 6            | 13           | 60          | 6              | 4      | FHP060                     | FHP060.A |
| 8            | 19           | 60          | 8              | 4      | FHP080                     | FHP080.A |
| 10           | 22           | 75          | 10             | 4      | FHP100                     | FHP100.A |
| 12           | 26           | 100         | 12             | 4      | FHP120                     | FHP120.A |
| 16           | 35           | 100         | 16             | 4      | FHP160                     | FHP160.A |
| 20           | 40           | 100         | 20             | 4      | FHP200                     | FHP200.A |

- 
- 
- 
- 
- 
- 
- 

Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm

切削條件表 **P423-424**  
Cutting Condition

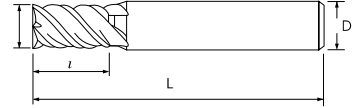
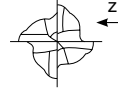
## FHP Type - Medium / Long Flute - 4 flutes

### 4刃長刃重切削立銑刀

**400** Nano **HRC** ▶ 60 **ALTIBN**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : FHPM030.A  
 採購代碼

#### UMG - FHPM

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 3            | 12           | 60          | 6              | 4      | FHPM030            | FHPM030.A                  |
| 4            | 16           | 60          | 6              | 4      | FHPM040            | FHPM040.A                  |
| 5            | 18           | 60          | 6              | 4      | FHPM050            | FHPM050.A                  |
| 6            | 20           | 60          | 6              | 4      | FHPM060            | FHPM060.A                  |
| 8            | 25           | 75          | 8              | 4      | FHPM080            | FHPM080.A                  |
| 10           | 30           | 80          | 10             | 4      | FHPM100            | FHPM100.A                  |
| 12           | 35           | 100         | 12             | 4      | FHPM120            | FHPM120.A                  |
| 16           | 45           | 110         | 16             | 4      | FHPM160            | FHPM160.A                  |
| 20           | 50           | 125         | 20             | 4      | FHPM200            | FHPM200.A                  |

#### UMG - FHPL

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 3            | 15           | 60          | 6              | 4      | FHPL030            | FHPL030.A                  |
| 4            | 20           | 60          | 6              | 4      | FHPL040            | FHPL040.A                  |
| 5            | 22           | 60          | 6              | 4      | FHPL050            | FHPL050.A                  |
| 6            | 25           | 75          | 6              | 4      | FHPL060            | FHPL060.A                  |
| 8            | 30           | 75          | 8              | 4      | FHPL080            | FHPL080.A                  |
| 10           | 35           | 80          | 10             | 4      | FHPL100            | FHPL100.A                  |
| 12           | 40           | 100         | 12             | 4      | FHPL120            | FHPL120.A                  |
| 16           | 55           | 110         | 16             | 4      | FHPL160            | FHPL160.A                  |
| 20           | 60           | 125         | 20             | 4      | FHPL200            | FHPL200.A                  |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm



切削條件表  
**P423-424**  
 Cutting Condition

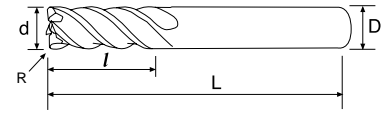
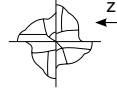
### FHP Type - Corner Radius - 4 flutes

## 4刃重切削圓鼻刀立銑刀



● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : CRFHP0302.A  
 採購代碼

| UMG - CR - FHP |               |              |             |                |        | Purchase Code 採購代碼    |                               |
|----------------|---------------|--------------|-------------|----------------|--------|-----------------------|-------------------------------|
| Dimension 規格   |               |              |             |                |        | Purchase Code 採購代碼    |                               |
| Diameter       | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type<br>標準刀型 | Anti-Vibration Design<br>抗震刀型 |
| d 直徑           | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                       |                               |
| 3              | 0.2           | 8            | 60          | 6              | 4      | CRFHP0302             | CRFHP0302.A                   |
| 3              | 0.5           | 8            | 60          | 6              | 4      | CRFHP0305             | CRFHP0305.A                   |
| 4              | 0.2           | 11           | 60          | 6              | 4      | CRFHP0402             | CRFHP0402.A                   |
| 4              | 0.5           | 11           | 60          | 6              | 4      | CRFHP0405             | CRFHP0405.A                   |
| 4              | 1             | 11           | 60          | 6              | 4      | CRFHP0410             | CRFHP0410.A                   |
| 5              | 0.2           | 13           | 60          | 6              | 4      | CRFHP0502             | CRFHP0502.A                   |
| 5              | 0.5           | 13           | 60          | 6              | 4      | CRFHP0505             | CRFHP0505.A                   |
| 5              | 1             | 13           | 60          | 6              | 4      | CRFHP0510             | CRFHP0510.A                   |
| 6              | 0.3           | 13           | 60          | 6              | 4      | CRFHP0603             | CRFHP0603.A                   |
| 6              | 0.5           | 13           | 60          | 6              | 4      | CRFHP0605             | CRFHP0605.A                   |
| 6              | 1             | 13           | 60          | 6              | 4      | CRFHP0610             | CRFHP0610.A                   |
| 8              | 0.3           | 19           | 60          | 8              | 4      | CRFHP0803             | CRFHP0803.A                   |
| 8              | 0.5           | 19           | 60          | 8              | 4      | CRFHP0805             | CRFHP0805.A                   |
| 8              | 1             | 19           | 60          | 8              | 4      | CRFHP0810             | CRFHP0810.A                   |
| 8              | 1.5           | 19           | 60          | 8              | 4      | CRFHP0815             | CRFHP0815.A                   |
| 8              | 2             | 19           | 60          | 8              | 4      | CRFHP0820             | CRFHP0820.A                   |
| 10             | 0.3           | 22           | 75          | 10             | 4      | CRFHP1003             | CRFHP1003.A                   |
| 10             | 0.5           | 22           | 75          | 10             | 4      | CRFHP1005             | CRFHP1005.A                   |
| 10             | 1             | 22           | 75          | 10             | 4      | CRFHP1010             | CRFHP1010.A                   |
| 10             | 1.5           | 22           | 75          | 10             | 4      | CRFHP1015             | CRFHP1015.A                   |
| 10             | 2             | 22           | 75          | 10             | 4      | CRFHP1020             | CRFHP1020.A                   |
| 10             | 3             | 22           | 75          | 10             | 4      | CRFHP1030             | CRFHP1030.A                   |
| 12             | 0.5           | 26           | 100         | 12             | 4      | CRFHP1205             | CRFHP1205.A                   |
| 12             | 1             | 26           | 100         | 12             | 4      | CRFHP1210             | CRFHP1210.A                   |
| 12             | 1.5           | 26           | 100         | 12             | 4      | CRFHP1215             | CRFHP1215.A                   |
| 12             | 2             | 26           | 100         | 12             | 4      | CRFHP1220             | CRFHP1220.A                   |
| 12             | 3             | 26           | 100         | 12             | 4      | CRFHP1230             | CRFHP1230.A                   |
| 16             | 1             | 35           | 100         | 16             | 4      | CRFHP1610             | CRFHP1610.A                   |
| 16             | 1.5           | 35           | 100         | 16             | 4      | CRFHP1615             | CRFHP1615.A                   |
| 16             | 2             | 35           | 100         | 16             | 4      | CRFHP1620             | CRFHP1620.A                   |
| 16             | 3             | 35           | 100         | 16             | 4      | CRFHP1630             | CRFHP1630.A                   |
| 20             | 1             | 40           | 100         | 20             | 4      | CRFHP2010             | CRFHP2010.A                   |
| 20             | 1.5           | 40           | 100         | 20             | 4      | CRFHP2015             | CRFHP2015.A                   |
| 20             | 2             | 40           | 100         | 20             | 4      | CRFHP2020             | CRFHP2020.A                   |
| 20             | 3             | 40           | 100         | 20             | 4      | CRFHP2030             | CRFHP2030.A                   |

Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm



# FHP+

series

### 創新 Innovation :

結合粗銑精銑的優點，金屬去除率高且快，並獲得光滑的表面質量。

Combine the advantage of roughing and finishing milling ,remove chip efficiently and smooth surface quality.

### 環保 Environment Protection :

AlCrSiN(nACro) 奈米氮化鉻鋁鈣塗層乾式切削技術，節省冷卻潤滑設備投資、降低加工成本、減少資源消耗、防止切削液污染環境、實現綠色加工。

- Excellent AlCrSiN(nACro)coating for dry machining
- Reduction of coolant oil
- Reduction of production cost
- Reduction of Energy Consumption
- Reduction of cleaning Effort
- Economical Environmentally manufacturing

Patent of Japan No: Nr.3145277  
本產品已獲日本專利 字號：Nr.3145277

Patent of Germany No: Nr.20 2007 008 896.5  
本產品已獲德國專利 字號：Nr.20 2007 008 896.5



Patent of China No: ZL 2007 2 0154039.4  
獲中國專利 字號：ZL 2007 2 0154039.4

Patent of Italy No: N. 0000268164  
獲義大利專利 字號：N. 0000268164

Patent of Taiwan No: M 328331  
獲台灣專利 字號：新型第 M 328331



創新 · 環保 · 專利

Innovation · Environmental Protection · Patent

## Details 產品特點



**UMG-FHPC**  
**UMG-FHPMC**  
**UMG-FHPLC**  
**UMG-CR-FHPC**



- The FHP<sup>+</sup> endmill features 4 flutes with a 45° helix, four serrated flutes and four continuous flutes.
- The tool is fully effective and enables running at rough machining parameters, resulting in finish surface quality.
- The unique tool design reduces vibration at high load applications.
- The tool produces short and long chips simultaneously. This chip mixture is evacuated more easily than each individual chip type an excellent solution in slotting and cavity milling applications.
- One tool change and setup time can be eliminated.
- A single tool replaces the roughing and finishing endmills, dramatically reducing cycle time and increasing productivity.
- Extra tool position is gained on the machine.
- Eliminates the need to keep a large amount of stock.
- 4 flutes : 4 serrated plus 4 continuous flutes.
- Excellent performance and tool life.
- Suitable for all types of steel.
- Excellent performance in machining titanium, Inconel, stainless steel and high temperature alloys.
- FHP+立銑刀，45° 螺旋角，4螺旋刃，4螺旋刃帶鋸齒，4光滑螺旋刃
- 高效刀具，粗加工的切削參數，精加工的表面質量
- 獨特設計減小了高負荷下刀具的振顫;有不等斷削槽設計
- 短小切屑及長切屑同時產生，長短混合的切屑比單一類型的切屑更易於排出，是槽銑加工及型腔銑削的出色解決方案
- 僅一把刀具，無調試時間
- 僅一把銑刀就完成了粗銑及精銑加工，出色地減少了加工週期及提高了生產率
- 刀庫中多了一個安裝其他刀具的刀位
- 當銑刀規格繁多時，會很明顯地為您減少庫存量
- 最頂尖的AlCrSiN奈米金屬三元素薄膜
- 4個螺旋刃，4螺旋刃帶鋸齒，4光滑螺旋刃
- 表現卓越，刀具壽命長
- 加工鈦合金，鎳鉻鐵合金 (inconel)，不鏽鋼及高溫合金時，表現不凡

**Upgrade**

Anti-Vibration Design  
升級款-抗震刀型



Unequal Helix Angle  
不等螺旋



Unequal Flute Spacing  
不等分割

FHPC video 切削影片



切削條件表 **P425**  
Cutting Condition

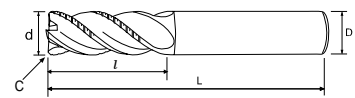
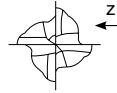
## FHP Plus Heavy duty - Square Type - 4 flutes

### ■ 加強版4刃重切削立銑刀



● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : FHPC060.A  
 採購代碼

#### UMG-FHPC ( 4 Flutes . Short )

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 6            | 13           | 60          | 6              | 4      | FHPC060            | FHPC060.A                  |
| 8            | 19           | 60          | 8              | 4      | FHPC080            | FHPC080.A                  |
| 10           | 22           | 75          | 10             | 4      | FHPC100            | FHPC100.A                  |
| 12           | 26           | 100         | 12             | 4      | FHPC120            | FHPC120.A                  |
| 16           | 35           | 100         | 16             | 4      | FHPC160            | FHPC160.A                  |
| 20           | 40           | 100         | 20             | 4      | FHPC200            | FHPC200.A                  |
| 25           | 50           | 110         | 25             | 4      | FHPC250            | FHPC250.A                  |

#### UMG-FHPMC ( 4 Flutes . Medium )

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 6            | 20           | 60          | 6              | 4      | FHPMC060           | FHPMC060.A                 |
| 8            | 25           | 75          | 8              | 4      | FHPMC080           | FHPMC080.A                 |
| 10           | 30           | 80          | 10             | 4      | FHPMC100           | FHPMC100.A                 |
| 12           | 35           | 100         | 12             | 4      | FHPMC120           | FHPMC120.A                 |
| 16           | 45           | 110         | 16             | 4      | FHPMC160           | FHPMC160.A                 |
| 20           | 50           | 125         | 20             | 4      | FHPMC200           | FHPMC200.A                 |
| 25           | 60           | 125         | 25             | 4      | FHPMC250           | FHPMC250.A                 |

#### UMG-FHPLC ( 4 Flutes . Long )

| Dimension 規格 |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 6            | 25           | 75          | 6              | 4      | FHPLC060           | FHPLC060.A                 |
| 8            | 30           | 75          | 8              | 4      | FHPLC080           | FHPLC080.A                 |
| 10           | 35           | 80          | 10             | 4      | FHPLC100           | FHPLC100.A                 |
| 12           | 40           | 100         | 12             | 4      | FHPLC120           | FHPLC120.A                 |
| 16           | 55           | 110         | 16             | 4      | FHPLC160           | FHPLC160.A                 |
| 20           | 60           | 125         | 20             | 4      | FHPLC200           | FHPLC200.A                 |
| 25           | 80           | 160         | 25             | 4      | FHPLC250           | FHPLC250.A                 |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                    | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      | ○      |        | ○                      | ○                      |                       |

Unit/單位: mm

切削條件表 **P425**  
Cutting Condition

### FHP Plus Heavy duty - Corner Radius Type - 4 flutes

## ■ 加強版4刃重切削圓鼻刀

400 Nano

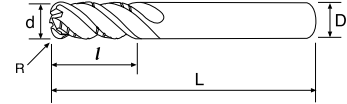
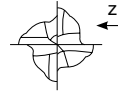
HRC ▶ 60

nACRo

R

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code 採購代碼 : CRFHPC0603.A

#### UMG-CR-FHPC ( 4 Flutes . Short with Corner Radius )

| Dimension 規格 |               |              |             |                |        | Purchase Code 採購代碼 |                            |
|--------------|---------------|--------------|-------------|----------------|--------|--------------------|----------------------------|
| Diameter     | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type 標準刀型 | Anti-Vibration Design 抗震刀型 |
| d 直徑         | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                            |
| 6            | 0.3           | 13           | 60          | 6              | 4      | CRFHPC0603         | CRFHPC0603.A               |
| 6            | 0.5           | 13           | 60          | 6              | 4      | CRFHPC0605         | CRFHPC0605.A               |
| 6            | 1             | 13           | 60          | 6              | 4      | CRFHPC0610         | CRFHPC0610.A               |
| 8            | 0.3           | 19           | 60          | 8              | 4      | CRFHPC0803         | CRFHPC0803.A               |
| 8            | 0.5           | 19           | 60          | 8              | 4      | CRFHPC0805         | CRFHPC0805.A               |
| 8            | 1             | 19           | 60          | 8              | 4      | CRFHPC0810         | CRFHPC0810.A               |
| 8            | 1.5           | 19           | 60          | 8              | 4      | CRFHPC0815         | CRFHPC0815.A               |
| 8            | 2             | 19           | 60          | 8              | 4      | CRFHPC0820         | CRFHPC0820.A               |
| 10           | 0.3           | 22           | 75          | 10             | 4      | CRFHPC1003         | CRFHPC1003.A               |
| 10           | 0.5           | 22           | 75          | 10             | 4      | CRFHPC1005         | CRFHPC1005.A               |
| 10           | 1             | 22           | 75          | 10             | 4      | CRFHPC1010         | CRFHPC1010.A               |
| 10           | 1.5           | 22           | 75          | 10             | 4      | CRFHPC1015         | CRFHPC1015.A               |
| 10           | 2             | 22           | 75          | 10             | 4      | CRFHPC1020         | CRFHPC1020.A               |
| 10           | 3             | 22           | 75          | 10             | 4      | CRFHPC1030         | CRFHPC1030.A               |
| 12           | 0.5           | 26           | 100         | 12             | 4      | CRFHPC1205         | CRFHPC1205.A               |
| 12           | 1             | 26           | 100         | 12             | 4      | CRFHPC1210         | CRFHPC1210.A               |
| 12           | 1.5           | 26           | 100         | 12             | 4      | CRFHPC1215         | CRFHPC1215.A               |
| 12           | 2             | 26           | 100         | 12             | 4      | CRFHPC1220         | CRFHPC1220.A               |
| 12           | 3             | 26           | 100         | 12             | 4      | CRFHPC1230         | CRFHPC1230.A               |
| 16           | 1             | 35           | 100         | 16             | 4      | CRFHPC1610         | CRFHPC1610.A               |
| 16           | 1.5           | 35           | 100         | 16             | 4      | CRFHPC1615         | CRFHPC1615.A               |
| 16           | 2             | 35           | 100         | 16             | 4      | CRFHPC1620         | CRFHPC1620.A               |
| 16           | 3             | 35           | 100         | 16             | 4      | CRFHPC1630         | CRFHPC1630.A               |
| 20           | 1             | 40           | 100         | 20             | 4      | CRFHPC2010         | CRFHPC2010.A               |
| 20           | 1.5           | 40           | 100         | 20             | 4      | CRFHPC2015         | CRFHPC2015.A               |
| 20           | 2             | 40           | 100         | 20             | 4      | CRFHPC2020         | CRFHPC2020.A               |
| 20           | 3             | 40           | 100         | 20             | 4      | CRFHPC2030         | CRFHPC2030.A               |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

#### Type of machining Process 多樣加工型態例



Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel, Alloy steel 炭素鋼, 合金鋼 | Pre-hardened steel 預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel 不鏽鋼 | Copper alloy 銅合金, 銅 | Aluminum alloy 鋁合金 |
|------------------------------------|------------------------|--------------------|--------|--------|--------|---------------------|---------------------|--------------------|
|                                    | ~45HRC                 | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                     |                     |                    |
| ◎                                  | ◎                      | ◎                  | ○      | ○      |        | ○                   | ○                   |                    |

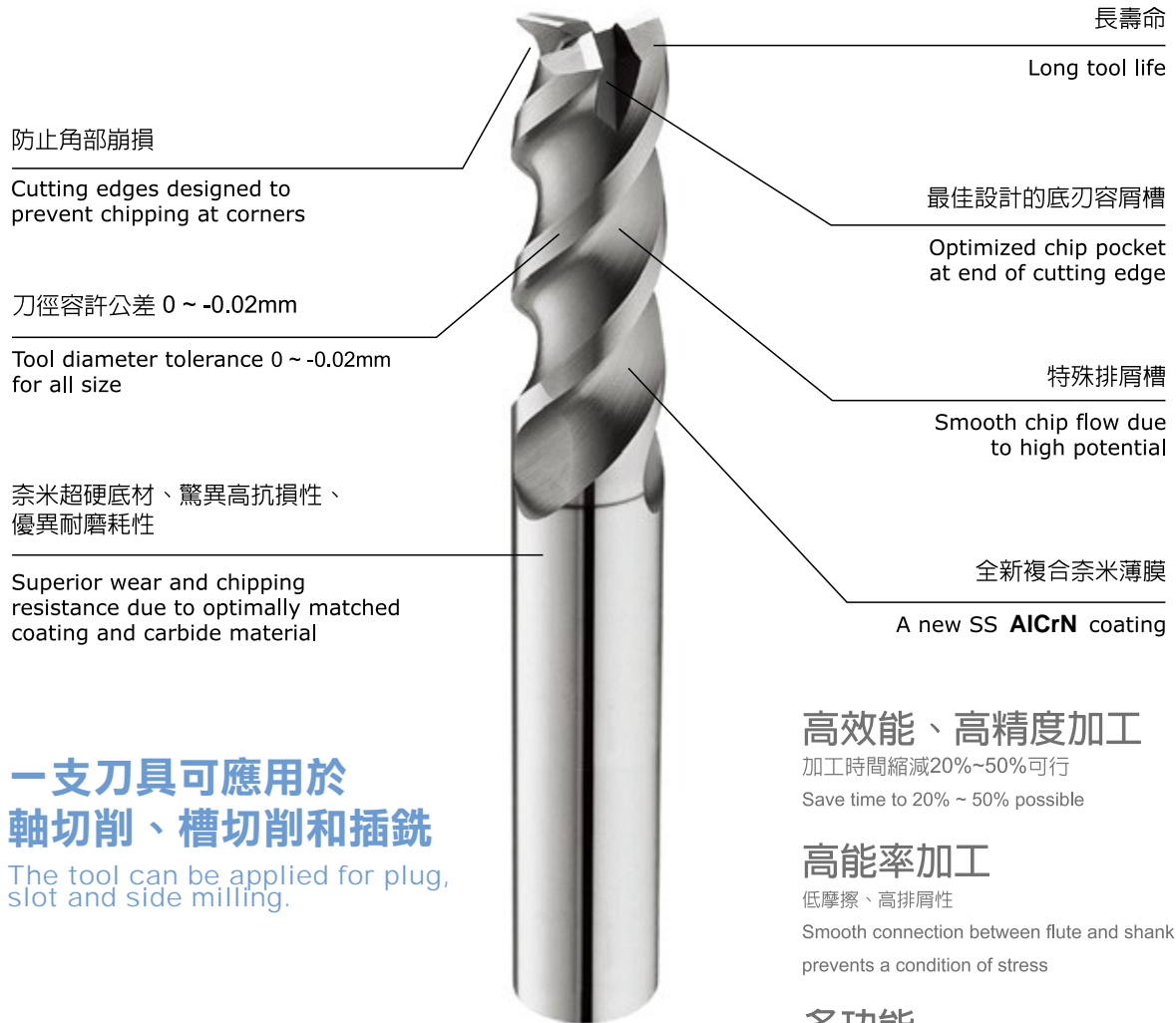
Unit/單位: mm



# HPSS

High Speed Plugging  
High Speed Slotting  
High Speed Side milling

# HPSS



## 一支刀具可應用於 軸切削、槽切削和插銑

The tool can be applied for plug, slot and side milling.

## 高效能、高精度加工

加工時間縮減20%~50%可行  
Save time to 20% ~ 50% possible

## 高能率加工

低摩擦、高排屑性  
Smooth connection between flute and shank prevents a condition of stress

## 多功能

插銑、側銑、溝加工一次完成，產能速增

### Upgrade

Anti-Vibration Design  
升級款-抗震刀型



Unequal Helix Angle  
不等螺旋



Unequal Flute Spacing  
不等分割

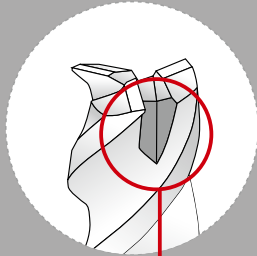


HPSS video  
切削影片

## 特點一

### 進化的3枚刀刃形狀

HPSS

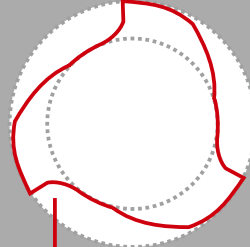


插銑時底刃排屑性能大幅提升  
Improve chip removing during the slotting

old design  
舊式形狀

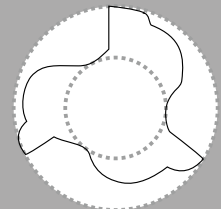


HPSS



增強側銑時剛性、提高排屑性能  
Advanced tool design. Improve tools life.

old design  
舊式形狀

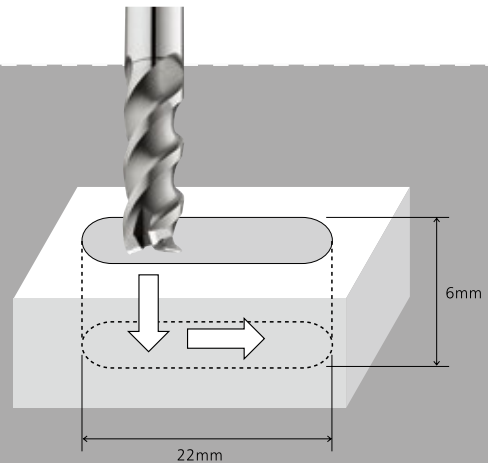
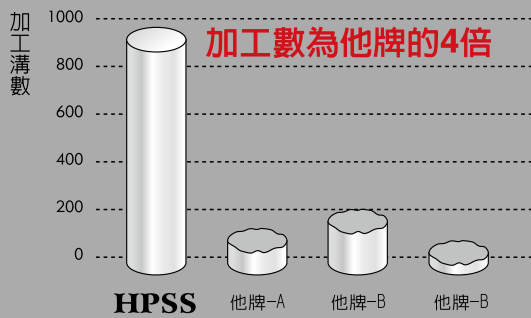


## 特點二

本銑刀同時具有鑽頭、插銑、溝加工、側面加工等多功能

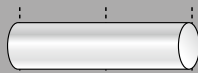
This multi-function endmill can be applied to plung, slot and side working.

### 溝加工範例一



### 溝加工範例二

HPSS



舊式2刃刀



加工時間大幅縮短為1/3

0 40秒 1分 2分



切削條件表 **P426**  
Cutting Condition

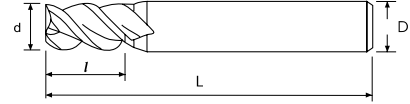
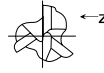
plugging+Slotting+Side milling

## ■ 插銑/溝銑/側銑三合一

**400 Nano** **HRC ▶ 45** **SS**

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



Purchase Code : HPSS0200.A  
採購代碼

| HPSS         |              |             |                |        | Purchase Code 採購代碼 |                       |
|--------------|--------------|-------------|----------------|--------|--------------------|-----------------------|
| Dimension 規格 |              |             |                |        | Standard Type 標準刀型 |                       |
| Diameter     | Flute Length | Full Length | Shank Diameter | Flutes | Standard Type      | Anti-Vibration Design |
| d 直徑         | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |                    |                       |
| 2            | 4            | 50          | 6              | 3      | HPSS0200           | HPSS0200.A            |
| 2.5          | 5            | 50          | 6              | 3      | HPSS0250           | HPSS0250.A            |
| 3            | 6            | 50          | 6              | 3      | HPSS0300           | HPSS0300.A            |
| 3.5          | 8            | 50          | 6              | 3      | HPSS0350           | HPSS0350.A            |
| 4            | 8            | 50          | 6              | 3      | HPSS0400           | HPSS0400.A            |
| 4.5          | 10           | 50          | 6              | 3      | HPSS0450           | HPSS0450.A            |
| 5            | 10           | 50          | 6              | 3      | HPSS0500           | HPSS0500.A            |
| 5.5          | 13           | 50          | 6              | 3      | HPSS0550           | HPSS0550.A            |
| 6            | 13           | 60          | 6              | 3      | HPSS0600           | HPSS0600.A            |
| 6.5          | 16           | 60          | 8              | 3      | HPSS0650           | HPSS0650.A            |
| 7            | 16           | 60          | 8              | 3      | HPSS0700           | HPSS0700.A            |
| 7.5          | 16           | 60          | 8              | 3      | HPSS0750           | HPSS0750.A            |
| 8            | 19           | 60          | 8              | 3      | HPSS0800           | HPSS0800.A            |
| 8.5          | 19           | 75          | 10             | 3      | HPSS0850           | HPSS0850.A            |
| 9            | 19           | 75          | 10             | 3      | HPSS0900           | HPSS0900.A            |
| 9.5          | 19           | 75          | 10             | 3      | HPSS0950           | HPSS0950.A            |
| 10           | 22           | 75          | 10             | 3      | HPSS1000           | HPSS1000.A            |
| 11           | 22           | 75          | 12             | 3      | HPSS1100           | HPSS1100.A            |
| 12           | 26           | 100         | 12             | 3      | HPSS1200           | HPSS1200.A            |
| 13           | 26           | 100         | 14             | 3      | HPSS1300           | HPSS1300.A            |
| 14           | 26           | 100         | 14             | 3      | HPSS1400           | HPSS1400.A            |
| 15           | 26           | 100         | 16             | 3      | HPSS1500           | HPSS1500.A            |
| 16           | 30           | 100         | 16             | 3      | HPSS1600           | HPSS1600.A            |
| 20           | 32           | 100         | 20             | 3      | HPSS2000           | HPSS2000.A            |

Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                     |        |        |        |                        |                        |                       |

Unit/單位: mm



# KK Series



獲德國專利 字號：Nr.20 2006 014 089.1  
Patent of Germany No:Nr.20 2006 014 089.1  
多國專利申請中  
Apply in the multinational patent.



獲日本專利 字號：Nr.3145278  
Patent of Japan No:Nr.3145278  
多國專利申請中  
Apply in the multinational patent.



獲中國專利 字號：ZL 2006 2 0124295.4  
Patent of China No:ZL 2006 2 0124295.4  
多國專利申請中  
Apply in the multinational patent.



獲台灣專利 字號：新型第 M 303075 號  
Patent of Taiwan No:M 303075  
多國專利申請中  
Apply in the multinational patent.

## Features 產品特點



Two flutes with four teeth, Four flutes with eight teeth, High performance, High efficient, double tooling life, saving time and cost.

Adding second cutting teeth near the major cutting teeth will improve the cutting performance greatly. The meaning of this new development is like the second razor blade innovating the shaving experience. KK is developed according to the innovation of razor. The characteristic of KK endmill is 2 flutes with 4, 3 flutes with 6 teeth, 4 flutes with 8 teeth, 5 flutes with 10 teeth. Geometric appearance of endmill creates longer tooling life, low vibration, high feed rate, and smooth surface. The reason of longer tooling life is when the major tooth wear, the second tooth is still shape. Longer tooling life also benefit to reduce the horizontal vibration. Close distance between two teeth make the cutting edge produce irregular touch with working material and reduce harmful resonance. It contributes to control vibration that changes of helix angle between every group tooth

Reduction of cutting load of per teeth, 2 teeth enable increase feed rate (for each group tooth, the cutting load of second tooth is less than first tooth so the cutting area of econd is smaller than first ones)

Low vibration and cutting flute sharpness with more lasting edge make a contribution to improvement of surface accuracy.

Stocked item: Dia 6mm~25mm  
Coating: KKH nACo  
KKM Si  
KKF、KKR nACro

二槽四刃、四槽八刃、多刃成精、效率加倍、壽命加倍、省時省力如果在這種傳統的刀具上離原來那個切削刃距離較近的地方加上第二個切削刃，將會極大地改善此類端銑刀的性能。這個發明帶來的意義正像剃鬚刀的第二塊刀片革新了剃須的體驗樣。根據這個發明生產出來的端銑刀如附圖所示。

這種“KK系列”端銑刀特徵是二槽四刃、三槽六刃、四槽八刃或五槽十刃。這種幾何表面為端銑刀提供了更長的刀具壽命、更低的振動、更高的進給量、更高的表面光潔度。刀具壽命的延長，是由於主刃磨損時，第二刃依然保持相對的鋒利。刀具壽命的延長同樣也受益於切削過程中振動水平的降低。兩齒間比較近的距離，使得齒與加工件間產生無規律接觸，從而極大地減少產生有害振動的諧波。每組切削刃之間變化的螺旋角也有助於控制振動。

因為每一切削刃切屑量減少，刃刃的加倍能使進給量成比例地增長。  
(對每一副切削刃而言，第二刃的切屑量確實比第一齒要少。當然，第二刃產生的切屑尺寸也相對較小)。低振動及切削刃更持久的鋒利度為表面加工精度的提高做出了貢獻。這種端銑刀目前可提供直徑6mm到25mm的規格。  
在最後完成工序時會塗上一層塗層。

| First Diameter (Roughing)<br>第一外徑 (粗胚) |   | Scenod Diameter (Finishing)<br>第二外徑 (精銑) |
|--|---|--|
| Diameter<br>刃 徑                        | Tolerance (Unit : mm )<br>公差 (單位 : mm ) | Tolerance (Unit : mm )<br>公差 (單位 : mm )  |
| 6mm                                    | -0.08~-0.10                             | +0.00~-0.02                              |
| 8mm                                    | -0.10~-0.12                             | +0.00~-0.02                              |
| 10mm                                   | -0.12~-0.15                             | +0.00~-0.02                              |
| 12mm                                   | -0.15~-0.18                             | +0.00~-0.02                              |
| 16mm                                   | -0.20~-0.24                             | +0.00~-0.02                              |
| 20mm                                   | -0.24~-0.30                             | +0.00~-0.02                              |

切削條件表 **P427**  
Cutting Condition

## KKH Multi Flutes High Efficiency

### ■ 多刃高效立銑刀

200 PLUS

HRC 65

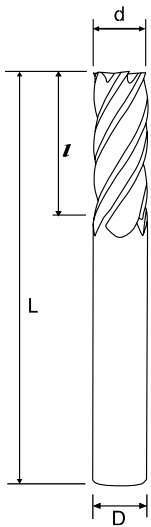
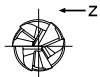
A D  
B C  
AFB#CFD

L3 L4  
L1 L2 L3 L4

P-nACo

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



#### KKH ( 2 Flutes - 2刃 )

| Mode          | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------------|-------------|----------------|--------|
| 型號            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKH0602P-nACo | 6        | 16           | 50          | 6              | 2      |
| KKH0802P-nACo | 8        | 19           | 60          | 8              | 2      |
| KKH1002P-nACo | 10       | 22           | 75          | 10             | 2      |
| KKH1202P-nACo | 12       | 26           | 75          | 12             | 2      |
| KKH1602P-nACo | 16       | 35           | 110         | 16             | 2      |
| KKH2002P-nACo | 20       | 40           | 110         | 20             | 2      |
| KKH2502P-nACo | 25       | 45           | 110         | 25             | 2      |

#### KKH ( 3 Flutes - 3刃 )

| Mode          | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------------|-------------|----------------|--------|
| 型號            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKH0603P-nACo | 6        | 16           | 50          | 6              | 3      |
| KKH0803P-nACo | 8        | 19           | 60          | 8              | 3      |
| KKH1003P-nACo | 10       | 25           | 75          | 10             | 3      |
| KKH1203P-nACo | 12       | 30           | 75          | 12             | 3      |
| KKH1603P-nACo | 16       | 40           | 110         | 16             | 3      |
| KKH2003P-nACo | 20       | 45           | 110         | 20             | 3      |
| KKH2503P-nACo | 25       | 50           | 110         | 25             | 3      |

#### KKH ( 4 Flutes - 4刃 )

| Mode          | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------------|-------------|----------------|--------|
| 型號            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKH1004P-nACo | 10       | 25           | 75          | 10             | 4      |
| KKH1204P-nACo | 12       | 30           | 75          | 12             | 4      |
| KKH1604P-nACo | 16       | 40           | 110         | 16             | 4      |
| KKH2004P-nACo | 20       | 45           | 110         | 20             | 4      |
| KKH2504P-nACo | 25       | 50           | 110         | 25             | 4      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                         | ◎                     | ◎      | ◎      | ◎      |                        |                        |                       |

切削條件表 **P428**  
Cutting Condition

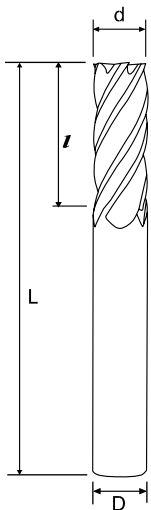
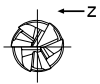
### KKM Multi Flutes High Efficiency

## 多刃高效立銑刀



● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



#### KKM ( 2 Flutes - 2刃 )

| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKM0602 | 6        | 16           | 50          | 6              | 2      |
| KKM0802 | 8        | 19           | 60          | 8              | 2      |
| KKM1002 | 10       | 22           | 75          | 10             | 2      |
| KKM1202 | 12       | 26           | 75          | 12             | 2      |
| KKM1602 | 16       | 35           | 110         | 16             | 2      |
| KKM2002 | 20       | 40           | 110         | 20             | 2      |
| KKM2502 | 25       | 45           | 110         | 25             | 2      |

#### KKM ( 3 Flutes - 3刃 )

| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKM0603 | 6        | 16           | 50          | 6              | 3      |
| KKM0803 | 8        | 19           | 60          | 8              | 3      |
| KKM1003 | 10       | 25           | 75          | 10             | 3      |
| KKM1203 | 12       | 30           | 75          | 12             | 3      |
| KKM1603 | 16       | 40           | 110         | 16             | 3      |
| KKM2003 | 20       | 45           | 110         | 20             | 3      |
| KKM2503 | 25       | 50           | 110         | 25             | 3      |

#### KKM ( 4 Flutes - 4刃 )

| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|---------|----------|--------------|-------------|----------------|--------|
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKM1004 | 10       | 25           | 75          | 10             | 4      |
| KKM1204 | 12       | 30           | 75          | 12             | 4      |
| KKM1604 | 16       | 40           | 110         | 16             | 4      |
| KKM2004 | 20       | 45           | 110         | 20             | 4      |
| KKM2504 | 25       | 50           | 110         | 25             | 4      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                         | ◎                     | ◎      |        |        |                        |                        |                       |

Unit/單位: mm

切削條件表  
**P429**  
Cutting Condition

## KKF Multi Flutes High Efficiency

### 多刃高效立銑刀

400  
Nano

HRC  
45

35°

nACRo

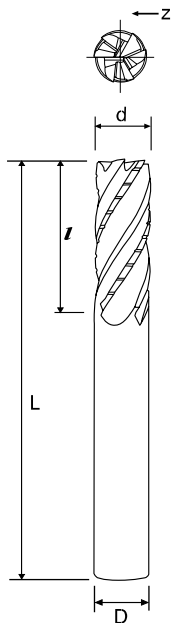
● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| KKF     |          |              |             |                |        |
|---------|----------|--------------|-------------|----------------|--------|
| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKF0602 | 6        | 16           | 50          | 6              | 2      |
| KKF0802 | 8        | 19           | 60          | 8              | 2      |
| KKF1002 | 10       | 25           | 75          | 10             | 2      |
| KKF1202 | 12       | 30           | 75          | 12             | 2      |
| KKF1602 | 16       | 35           | 110         | 16             | 2      |
| KKF2002 | 20       | 45           | 110         | 20             | 2      |

| KKF     |          |              |             |                |        |
|---------|----------|--------------|-------------|----------------|--------|
| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKF0603 | 6        | 16           | 50          | 6              | 3      |
| KKF0803 | 8        | 19           | 60          | 8              | 3      |
| KKF1003 | 10       | 25           | 75          | 10             | 3      |
| KKF1203 | 12       | 30           | 75          | 12             | 3      |
| KKF1603 | 16       | 35           | 110         | 16             | 3      |
| KKF2003 | 20       | 45           | 110         | 20             | 3      |



- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ◎                       | ○                     | ○      |        |        |                        |                        |                       |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P430**

## KKR Multi Flutes High Efficiency

### 多刃高效立銑刀

400  
Nano

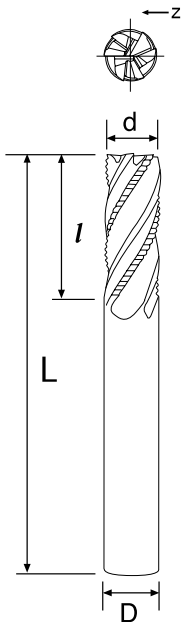
HRC  
▶ 45

35°

nACRo

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| KKR     |          |              |             |                |        |
|---------|----------|--------------|-------------|----------------|--------|
| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKR0602 | 6        | 16           | 50          | 6              | 2      |
| KKR0802 | 8        | 19           | 60          | 8              | 2      |
| KKR1002 | 10       | 25           | 75          | 10             | 2      |
| KKR1202 | 12       | 30           | 75          | 12             | 2      |
| KKR1602 | 16       | 35           | 110         | 16             | 2      |
| KKR2002 | 20       | 45           | 110         | 20             | 2      |
| KKR2502 | 25       | 50           | 110         | 25             | 2      |

| KKR     |          |              |             |                |        |
|---------|----------|--------------|-------------|----------------|--------|
| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KKR0603 | 6        | 16           | 50          | 6              | 3      |
| KKR0803 | 8        | 19           | 60          | 8              | 3      |
| KKR1003 | 10       | 25           | 75          | 10             | 3      |
| KKR1203 | 12       | 30           | 75          | 12             | 3      |
| KKR1603 | 16       | 35           | 110         | 16             | 3      |
| KKR2003 | 20       | 45           | 110         | 20             | 3      |
| KKR2503 | 25       | 50           | 110         | 25             | 3      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ◎                       | ○                     | ○      |        |        |                        |                        |                       |

Unit/單位: mm

SH

**Super High Hardness  
& Super High Speed Cutting**

End Mill Series For High Hardness Steeles

KCR video  
切削影片

高硬度鋼加工超長壽命  
 超高表面硬度 · 超高速加工  
 超高附著薄膜 · 超高硬度薄膜  
 震虎與 **Ion Bond** 技術合作開發

Long life for high hardness steel

Super high hardness, super high speed cutting

Super high adhesion coating & super high hardness coating

 Super Coating SH

- 奈米複合塗層採用奈米晶格靶材，大幅改善附著效果，並且維持更亮的耐摩耗性。
- 非常出色地應用在塑膠模，尤其是在NAK鋼加工效率在2倍以上，並且在合金鋼NAK、碳鋼形成超長刀具壽命和高品質加工。
- 摩擦係數大幅改善，形成較低的切削溫度，所以乾式切削可行，超高速切削亦可行。
- Nano-composite coating which is improved the adhesion property without making the abrassive property lower by new coating mterial of nano-crystal.
- Excellent cutting is reached in machining plastic moulds, especially in NAK steels with over two times in machining efficiency. Long tool life and precision machining in carbon steels, alloy steels, NAK55 etc.
- Dry cutting applicable, because of less cutting heat by improving friction property very much and high speed cutting applicable.

Swiss & SPEED TIGER  
Technological Cooperation



## SH Super High Hardness & Super High Speed Cutting

End Mill Series For High Performance roughing

Super Hardness Steel Coating "SH" - SH Power Radius

### 產品特點 Features

採用先進奈米晶格SH塗層，擁有高附著性和高硬度  
Developed NaNo SH Coating of high adhesion and high hardness is adopted.

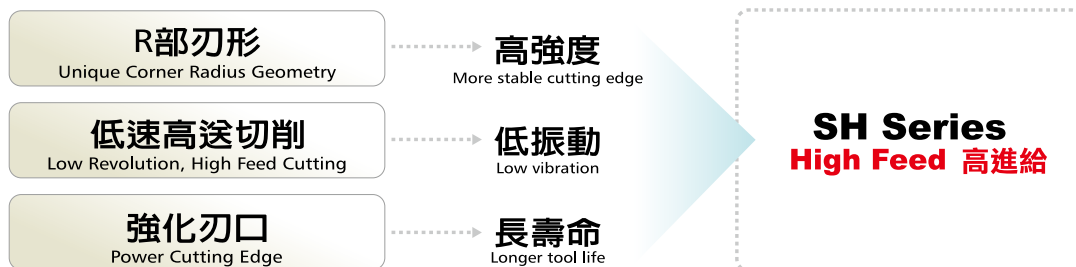
**長壽命** Long Tool Life • **工具壽命大大提昇** The tool life has drastically been improved  
**高精度** High Accuracy • **尺寸變化極少，精加工最適合** Less dimensional change, It's suitable for finishing

最新幾何刃刃形狀，擁有最高剛性Rx1保證，高精度R值  
A new geometry is adopted to ensure rigidity and excellent R accuracy & specially cutting edge.

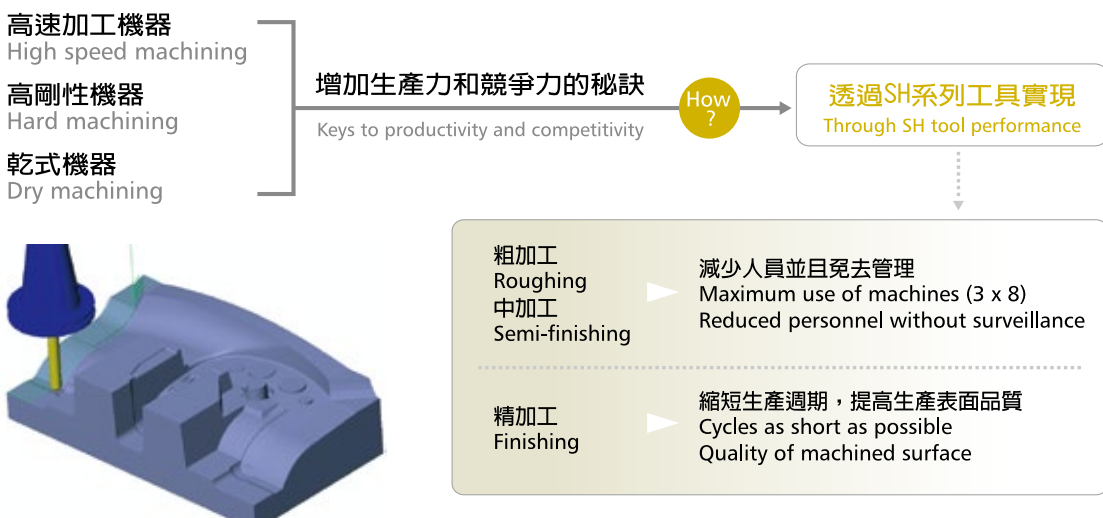
**高能率** High Efficient • **強力重切削粗加工可行** A powerful roughing is available  
**高精度** High Accuracy • **高精度超精密加工** Highly accurate finish cutting is possible

- SH 系列強而有力的表現在形形色色的材質加工，從預熱鋼HRC45°到高硬度鋼HRC65°
- 特別應用在模具銑削 SH系列表現出無與倫比的超高速精度粗加工(超過一般圓鼻刀 3倍以上效率)
- R精度±0.01mm以下，尺寸磨耗小，高精密度精加工可行
- The tool exhibits its power to various materials from pre-hardened steel(45 HRC class to high hardness 65 HRC class)
- Especially for tp make possible the high performance roughing process on molds milling (3 times or more efficient than of a general radius endmill)
- R tolerance: ±0.01mm. Highly accurate finish cutting is possible

### 超高速進給、高能率切削三要素 Ultra high Feed cutting



### 工具和模具製造業 Tool and mould manufacturing



切削條件表 **P431**  
Cutting Condition

## SH KTG Super High Hardness & Super High Speed Cutting Ball Nose Type



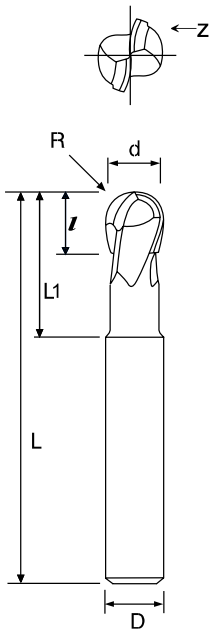
### ■ 超高硬度 / 超高速加工球刀

● Ultra Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| SH KTG    |          |        |              |                  |          |             |                |
|-----------|----------|--------|--------------|------------------|----------|-------------|----------------|
| Mode      | Diameter | Radius | Flute Length | Efficient Length | Neck Dia | Full Length | Shank Diameter |
| 型號        | d 直徑     | R 角    | l 刃長         | L1 有效長           | 頸徑       | L 全長        | D 柄徑           |
| KTG0102SH | 1        | 0.5    | 1            | 2.5              | 0.96     | 50          | 6              |
| KTG0152SH | 1.5      | 0.75   | 1.5          | 4                | 1.46     | 50          | 6              |
| KTG0202SH | 2        | 1      | 2            | 6                | 1.96     | 50          | 6              |
| KTG0252SH | 2.5      | 1.25   | 2.5          | 7                | 2.46     | 50          | 6              |
| KTG0302SH | 3        | 1.5    | 3            | 8                | 2.96     | 50          | 6              |
| KTG4402SH | 4        | 2      | 4            | 8                | 3.96     | 50          | 4              |
| KTG0402SH | 4        | 2      | 4            | 8                | 3.96     | 50          | 6              |
| KTG0502SH | 5        | 2.5    | 5            | 12               | 4.96     | 50          | 6              |
| KTG0602SH | 6        | 3      | 6            | 13               | 5.96     | 50          | 6              |
| KTG0802SH | 8        | 4      | 8            | 16               | 7.9      | 60          | 8              |
| KTG1002SH | 10       | 5      | 10           | 20               | 9.9      | 75          | 10             |
| KTG1202SH | 12       | 6      | 12           | 24               | 11.9     | 75          | 12             |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                  | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ○  | ○                       | ◎                     | ◎      | ◎      | ★      |                        |                        |                       |

Unit/單位: mm

切削條件表  
Cutting Condition  
**P432**

SH Super High Speed / High Hardness

## ■ 超高硬度 / 超高速加工圓鼻刀

200  
Nano

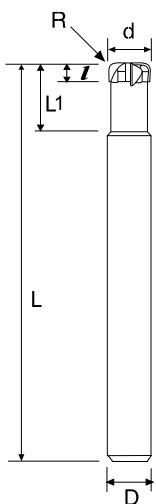
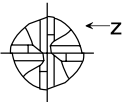
HRC  
65

5°

SH

● Ultra Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm<sup>2</sup> Grain Size=0.2μm



| SH KCR  |          |               |              |                  |          |             |                |        |
|---------|----------|---------------|--------------|------------------|----------|-------------|----------------|--------|
| Mode    | Diameter | Corner Radius | Flute Length | Efficient Length | Neck Dia | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | R 角           | l 刃長         | L1 有效長           | 頸徑       | L 全長        | D 柄徑           | Z 刃數   |
| KCR0203 | 2        | 0.3           | 0.8          | 5                | 1.8      | 60          | 6              | 4      |
| KCR0205 | 2        | 0.5           | 0.8          | 5                | 1.8      | 60          | 6              | 4      |
| KCR0307 | 3        | 0.75          | 1.2          | 7.5              | 2.7      | 60          | 6              | 4      |
| KCR0310 | 3        | 1             | 1.2          | 7.5              | 2.7      | 60          | 6              | 4      |
| KCR0405 | 4        | 0.5           | 1.6          | 10               | 3.6      | 75          | 6              | 4      |
| KCR0410 | 4        | 1             | 1.6          | 10               | 3.6      | 75          | 6              | 4      |
| KCR0510 | 5        | 1             | 2            | 12               | 4.5      | 75          | 6              | 4      |
| KCR0512 | 5        | 1.2           | 2            | 12               | 4.5      | 75          | 6              | 4      |
| KCR0610 | 6        | 1             | 2.5          | 13               | 5.4      | 100         | 6              | 4      |
| KCR0615 | 6        | 1.5           | 2.5          | 13               | 5.4      | 100         | 6              | 4      |
| KCR0810 | 8        | 1             | 3.5          | 16               | 7.2      | 100         | 8              | 4      |
| KCR0820 | 8        | 2             | 3.5          | 16               | 7.2      | 100         | 8              | 4      |
| KCR0920 | 9        | 2             | 4            | 18               | 8.2      | 100         | 10             | 4      |
| KCR1010 | 10       | 1             | 4            | 20               | 9        | 100         | 10             | 4      |
| KCR1020 | 10       | 2             | 4            | 20               | 9        | 100         | 10             | 4      |
| KCR1210 | 12       | 1             | 5            | 24               | 11       | 100         | 12             | 4      |
| KCR1220 | 12       | 2             | 5            | 24               | 11       | 100         | 12             | 4      |
| KCR1230 | 12       | 3             | 5            | 24               | 11       | 100         | 12             | 4      |

- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55
- HRC ▶ 60
- HRC ▶ 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                       | ◎                     | ◎      | ◎      | ★      |                        |                        |                       |

Unit/單位: mm



SAVE TIME

# **ST** SPEED TIGER **BIG FOOT** **RADIUS** **ENDMILL**



100%

↓ BALLNOSE ENDMILL



50%





長壽命  
Long tool life

高效能  
High efficient

高精度  
High accuracy

全新氮化鋁鈦  
A new SH Al/Tin coating

刀刃平順光滑  
Smooth radiul relief

刀徑容許公差 0 ~ -0.02mm  
Tool diameter tolerance 0 ~ -0.02mm for all size

奈米超硬底材、驚異高抗損性、優異耐磨耗性  
Superior wear and chipping resistance due to optimally matched coating and carbide material

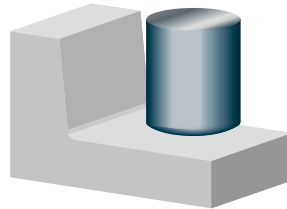
**高效能、高精度加工**  
加工時間縮減20%~50%可行

**高能率加工**  
橢圓形狀，切削接觸面積增大  
加工時間縮減20%~50%可行

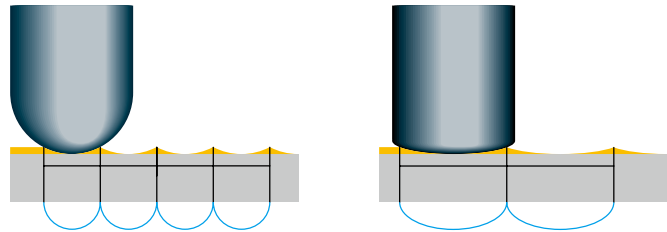
**長壽命**  
橢圓形狀同球型銑刀加工場合  
走行距離大幅縮短  
形成長壽命

## 加工資訊 CUTTING DATA

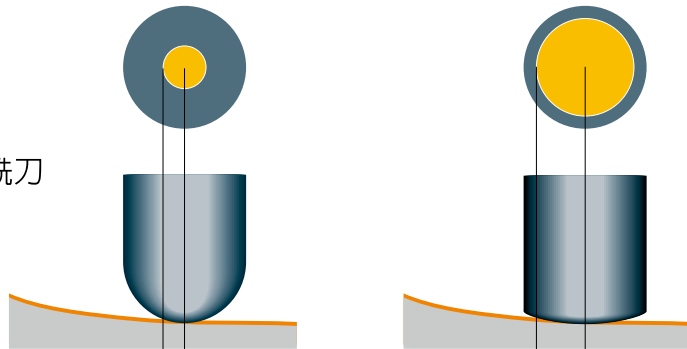
加工法-1：  
加工面工具選擇效率良加工  
Super smooth finished surface



加工法-2：  
走行距離(加工時間)縮短  
High efficiency milling by oval nose  
instead of ball end mill



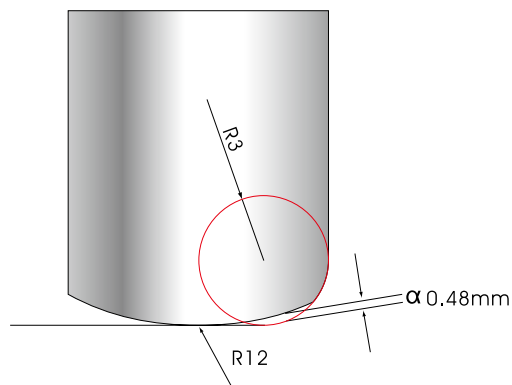
加工法-3：  
高效率、低成本替代同R值球型銑刀  
The efficiency is equal to  
one size larger ball



### 如何定義刀具形狀

大面積粗加工時程式輸入圓鼻刀，  
取接近R值但勿超出R值，  
殘料如右圖：

By inputting radius mill approximate corner R,  
insert R cutting remains processing as shown  
right is possible for roughing procedures.



切削  
條件表  
Cutting Condition

**P433**

## BIG FOOT Super Remover

### ■ BIG FOOT 高移除率球刀

400  
Nano

HRC  
▶ 60

30°

SH

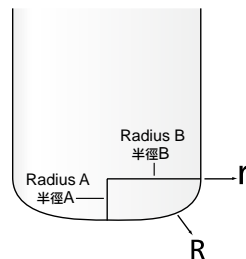
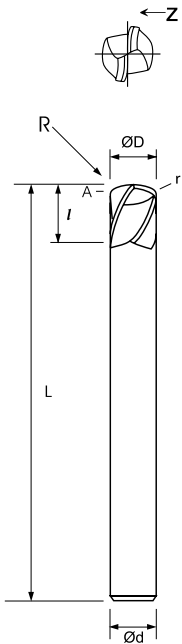
R  
±0.01

● Ultra Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



| BIG FOOT |          |               |          |          |        |              |             |                |
|----------|----------|---------------|----------|----------|--------|--------------|-------------|----------------|
| Mode     | Diameter | Corner Radius | Radius A | Radius B | Corner | Flute Length | Full Length | Shank Diameter |
| 型號       | d 直徑     | R 角           | A 半徑     | B 半徑     | r      | l 刃長         | L 全長        | D 柄徑           |
| BFR06050 | 6        | 5             | 0.66     | 3        | 2      | 7            | 60          | 6              |
| BFR06051 | 6        | 5             | 0.66     | 3        | 2      | 7            | 100         | 6              |
| BFR06060 | 6        | 6             | 0.66     | 3        | 1.5    | 7            | 60          | 6              |
| BFR06061 | 6        | 6             | 0.66     | 3        | 1.5    | 7            | 100         | 6              |
| BFR08080 | 8        | 8             | 0.88     | 4        | 2      | 9            | 60          | 8              |
| BFR08081 | 8        | 8             | 0.88     | 4        | 2      | 9            | 100         | 8              |
| BFR10100 | 10       | 10            | 0.9      | 5        | 3      | 11           | 75          | 10             |
| BFR10101 | 10       | 10            | 0.9      | 5        | 3      | 11           | 100         | 10             |
| BFR12120 | 12       | 12            | 1.6      | 6        | 3      | 13           | 75          | 12             |
| BFR12121 | 12       | 12            | 1.6      | 6        | 3      | 13           | 100         | 12             |
| BFR12150 | 12       | 15            | 0.91     | 6        | 3      | 15           | 75          | 12             |
| BFR12151 | 12       | 15            | 0.91     | 6        | 3      | 15           | 100         | 12             |
| BFR16160 | 16       | 16            | 1.77     | 8        | 4      | 18           | 150         | 16             |
| BFR16200 | 16       | 20            | 1.5      | 8        | 3      | 22           | 150         | 16             |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                  | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ○  | ○                       | ◎                     | ◎      | ◎      | ★      |                        |                        |                       |

Unit/單位: mm

SUS

Unceasing transcend self  
Appear perfect limit

結合材料、研磨、塗層三要素而成的SUS系列銑刀提供了絕佳的耐磨性，可以說不局限於不銹鋼在一般加工也可得到長壽命。因為SSA薄膜提供了高氧化溫度、高硬度及抗沾粘特性，SUS系列銑刀在銑削不銹鋼加工上是不銹鋼加工上特有的損傷能力強，可得到穩定的長壽命新刀具，使用這款新刀具肯定可以為刀具壽命短且不穩定而煩惱的眾多不銹鋼加工用戶解決困難，以及在難切削材料加工中追求高速高效用戶降低成本。

Tip  
尖角

Power cutting edge, and the SSA coating can improve the hardness to HV4,000 for the surface of cutter.

SUS系列銑刀刃口皆做強化處理不易崩損，再加上SSA塗層提昇刀具表面硬度達HV4,000

SUS series end mill use SSA (AlCr<sub>2</sub>O<sub>3</sub>) coating, can reach the anti-oxidation to 1,100 degree.

SUS系列銑刀皆採用SSA(AlCr<sub>2</sub>O<sub>3</sub>)塗層，其最大特性可耐氧化溫度到1,100°C

SSA coating passed through the NANO level, can increase the hardness and wear-resisting, also effective segregate the stick between the work piece and cutting tool.

SSA塗層通過奈米化可提高硬度及耐磨性，SSA(AlCr<sub>2</sub>O<sub>3</sub>)膜並可以有效隔離工件材料和刀具材料粘著





## SUS Stainless Steel Expert

### ■ 不鏽鋼專用立銑刀



● Ultra Micro Grain Carbide

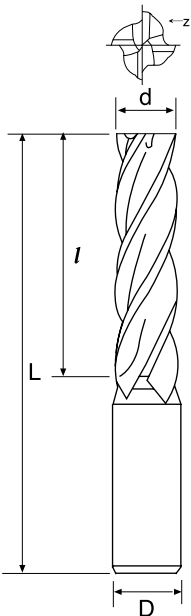
● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



切削條件表 **P336-337**

Cutting Condition

| SUS     |          |              |             |                |        |
|---------|----------|--------------|-------------|----------------|--------|
| Mode    | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號      | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUS0104 | 1        | 3            | 50          | 4              | 4      |
| SUS0154 | 1.5      | 4            | 50          | 4              | 4      |
| SUS0204 | 2        | 6            | 50          | 4              | 4      |
| SUS0254 | 2.5      | 8            | 50          | 4              | 4      |
| SUS0304 | 3        | 9            | 50          | 4              | 4      |
| SUS6304 | 3        | 9            | 50          | 6              | 4      |
| SUS0404 | 4        | 11           | 50          | 4              | 4      |
| SUS6404 | 4        | 11           | 50          | 6              | 4      |
| SUS0504 | 5        | 13           | 50          | 6              | 4      |
| SUS0604 | 6        | 16           | 50          | 6              | 4      |
| SUS0804 | 8        | 20           | 60          | 8              | 4      |
| SUS1004 | 10       | 30           | 75          | 10             | 4      |
| SUS1204 | 12       | 32           | 75          | 12             | 4      |



切削條件表 **P359**

Cutting Condition

| SUSL     |          |              |             |                |        |
|----------|----------|--------------|-------------|----------------|--------|
| Mode     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
| 型號       | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SUSL0104 | 1        | 4            | 50          | 4              | 4      |
| SUSL0154 | 1.5      | 6            | 50          | 4              | 4      |
| SUSL0204 | 2        | 8            | 50          | 4              | 4      |
| SUSL0254 | 2.5      | 10           | 50          | 4              | 4      |
| SUSL6304 | 3        | 12           | 50          | 6              | 4      |
| SUSL6404 | 4        | 16           | 50          | 6              | 4      |
| SUSL0504 | 5        | 20           | 60          | 6              | 4      |
| SUSL0604 | 6        | 24           | 60          | 6              | 4      |
| SUSL0804 | 8        | 35           | 75          | 8              | 4      |
| SUSL1004 | 10       | 45           | 100         | 10             | 4      |
| SUSL1204 | 12       | 45           | 100         | 12             | 4      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                       |                       |        |        |        | ◎                      |                        |                       |

Unit/單位: mm

切削  
條件表 **P434**  
Cutting Condition

## Multi - Function type - 2 flutes

### 2刃多功能立銑刀

600  
Nano

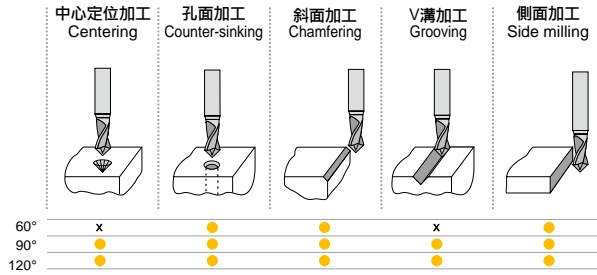
HRC  
50

35°

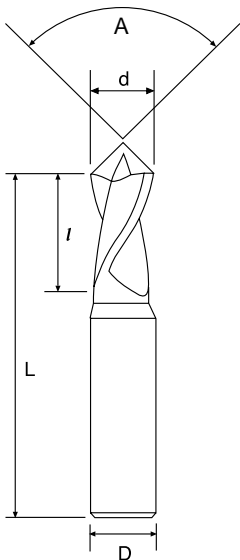
ALTIBN

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE             | Diameter | Flute Length | Full Length | Shank Diameter | Tip Angle | Flutes |
|------------------|----------|--------------|-------------|----------------|-----------|--------|
| 型號               | d 刀徑     | ℓ 刃長         | L 全長        | D 柄徑           | A 前端角     | Z 刃數   |
| CDM060030 ALTIBN | 3        | 6            | 50          | 4              | 60°       | 2      |
| CDM090030 ALTIBN | 3        | 6            | 50          | 4              | 90°       | 2      |
| CDM120030 ALTIBN | 3        | 6            | 50          | 4              | 120°      | 2      |
| CDM060040 ALTIBN | 4        | 8            | 50          | 6              | 60°       | 2      |
| CDM090040 ALTIBN | 4        | 8            | 50          | 6              | 90°       | 2      |
| CDM120040 ALTIBN | 4        | 8            | 50          | 6              | 120°      | 2      |
| CDM060050 ALTIBN | 5        | 10           | 50          | 6              | 60°       | 2      |
| CDM090050 ALTIBN | 5        | 10           | 50          | 6              | 90°       | 2      |
| CDM120050 ALTIBN | 5        | 10           | 50          | 6              | 120°      | 2      |
| CDM060060 ALTIBN | 6        | 12           | 60          | 8              | 60°       | 2      |
| CDM090060 ALTIBN | 6        | 12           | 60          | 8              | 90°       | 2      |
| CDM120060 ALTIBN | 6        | 12           | 60          | 8              | 120°      | 2      |
| CDM060080 ALTIBN | 8        | 16           | 75          | 10             | 60°       | 2      |
| CDM090080 ALTIBN | 8        | 16           | 75          | 10             | 90°       | 2      |
| CDM120080 ALTIBN | 8        | 16           | 75          | 10             | 120°      | 2      |
| CDM060100 ALTIBN | 10       | 20           | 75          | 12             | 60°       | 2      |
| CDM090100 ALTIBN | 10       | 20           | 75          | 12             | 90°       | 2      |
| CDM120100 ALTIBN | 10       | 20           | 75          | 12             | 120°      | 2      |
| CDM060120 ALTIBN | 12       | 25           | 75          | 12             | 60°       | 2      |
| CDM090120 ALTIBN | 12       | 25           | 75          | 12             | 90°       | 2      |
| CDM120120 ALTIBN | 12       | 25           | 75          | 12             | 120°      | 2      |
| CDM060140 ALTIBN | 14       | 28           | 80          | 14             | 60°       | 2      |
| CDM090140 ALTIBN | 14       | 28           | 80          | 14             | 90°       | 2      |
| CDM120140 ALTIBN | 14       | 28           | 80          | 14             | 120°      | 2      |
| CDM060160 ALTIBN | 16       | 32           | 100         | 16             | 60°       | 2      |
| CDM090160 ALTIBN | 16       | 32           | 100         | 16             | 90°       | 2      |
| CDM120160 ALTIBN | 16       | 32           | 100         | 16             | 120°      | 2      |
| CDM060200 ALTIBN | 20       | 35           | 100         | 20             | 60°       | 2      |
| CDM090200 ALTIBN | 20       | 35           | 100         | 20             | 90°       | 2      |
| CDM120200 ALTIBN | 20       | 35           | 100         | 20             | 120°      | 2      |



Application 適用材質：

◎ Recommend 最適合 ○ Suitable 適合 X Not Recommend 不建議

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                    | -50HRC                | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ○  | ◎                         | ◎                     | ○      |        |        | ○                      |                        |                       |

Available at  
**amazon**

**FRACTIONAL 英制**

**HIGH PERFORMANCE FOR EXOTIC MATERIALS  
GENERAL APPLICATION**



Cutting Condition  
**P435-440**

## Square Type - 2 flutes

### ■ 2刃立銑刀

**600**  
Nano

**HRC**  
▶ 55

**35°**

**ALTIBN**

● Micro Grain Carbide

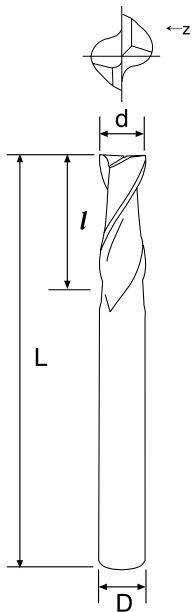
● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm

### FRACTIONAL 英制



| MODE<br>型號 | Diameter | Flute<br>Length | Full<br>Length | Shank<br>Diameter | Flutes |
|------------|----------|-----------------|----------------|-------------------|--------|
|            | d 直徑     | l 刃長            | L 全長           | D 柄徑              | Z 刃數   |
| ISE1/16"2T | 1/16     | 3/16            | 1-1/2          | 1/8               | 2      |
| ISE5/64"2T | 5/64     | 3/16            | 1-1/2          | 1/8               | 2      |
| ISE3/32"2T | 3/32     | 9/32            | 1-1/2          | 1/8               | 2      |
| ISE7/64"2T | 7/64     | 3/8             | 1-1/2          | 1/8               | 2      |
| ISE1/8"2T  | 1/8      | 3/8             | 1-1/2          | 1/8               | 2      |
| ISE3/16"2T | 3/16     | 5/8             | 2              | 3/16              | 2      |
| ISE1/4"2T  | 1/4      | 3/4             | 2-1/2          | 1/4               | 2      |
| ISE5/16"2T | 5/16     | 13/16           | 2-1/2          | 5/16              | 2      |
| ISE3/8"2T  | 3/8      | 1               | 2-1/2          | 3/8               | 2      |
| ISE1/2"2T  | 1/2      | 1               | 3              | 1/2               | 2      |
| ISE5/8"2T  | 5/8      | 1-1/4           | 3-1/2          | 5/8               | 2      |

Unit:inch



- HRC ▶ 40
- HRC ▶ 45
- HRC ▶ 50
- HRC ▶ 55**
- HRC ▶ 60
- HRC ▶ 65
- ☉
- ☉
- ☉
- ☉
- ☉
- ☉
- ☉
- ☉
- ☉
- ☉

Application 適用材質：

★ Perfect 最推薦    ☉ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼,合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金,銅 | Aluminum alloy<br>鋁合金 |
|---|-------------------------|-----------------------|--------|--------|------------------------|-----------------------|-----------------------|
|   | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC |                        |                       |                       |
| ☉                                       | ☉                       | ☉                     | ○      |        | ○                      |                       |                       |

Cutting Condition  
**P435-440**

## Square Type - 4 flutes

### ■ 4刃立銑刀

**600**  
Nano

**HRC**  
▶ 55

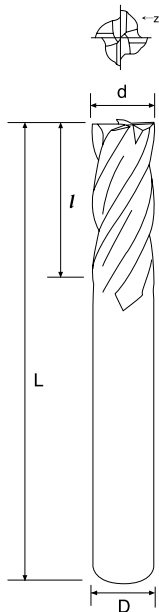
**35°**

**ALTIBN**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm

#### FRACTIONAL 英制



| MODE<br>型號 | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
|            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ISE1/16"4T | 1/16     | 3/16         | 1-1/2       | 1/8            | 4      |
| ISE5/64"4T | 5/64     | 3/16         | 1-1/2       | 1/8            | 4      |
| ISE3/32"4T | 3/32     | 9/32         | 1-1/2       | 1/8            | 4      |
| ISE7/64"4T | 7/64     | 3/8          | 1-1/2       | 1/8            | 4      |
| ISE1/8"4T  | 1/8      | 3/8          | 1-1/2       | 1/8            | 4      |
| ISE3/16"4T | 3/16     | 5/8          | 2           | 3/16           | 4      |
| ISE1/4"4T  | 1/4      | 3/4          | 2-1/2       | 1/4            | 4      |
| ISE5/16"4T | 5/16     | 13/16        | 2-1/2       | 5/16           | 4      |
| ISE3/8"4T  | 3/8      | 1            | 2-1/2       | 3/8            | 4      |
| ISE1/2"4T  | 1/2      | 1            | 3           | 1/2            | 4      |
| ISE5/8"4T  | 5/8      | 1-1/4        | 3-1/2       | 5/8            | 4      |

Unit:inch

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

**HRC**  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                     | ○      |        |        | ○                      |                        |                       |

Cutting Condition  
**P435-440**

## Ball Nose Type - 2 flutes

### ■ 2刃球型立銑刀

600  
Nano

HRC  
55

35°

ALTiBN

● Micro Grain Carbide

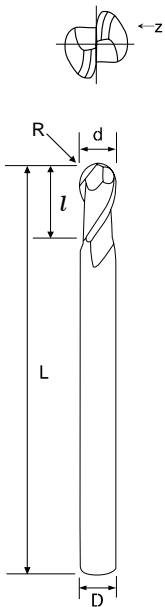
● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm

#### FRACTIONAL 英制



| MODE<br>型號 | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
|            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| ISB1/16"2T | 1/16     | 3/16         | 1-1/2       | 1/8            | 2      |
| ISB5/64"2T | 5/64     | 3/16         | 1-1/2       | 1/8            | 2      |
| ISB3/32"2T | 3/32     | 9/32         | 1-1/2       | 1/8            | 2      |
| ISB7/64"2T | 7/64     | 3/8          | 1-1/2       | 1/8            | 2      |
| ISB1/8"2T  | 1/8      | 3/8          | 1-1/2       | 1/8            | 2      |
| ISB3/16"2T | 3/16     | 5/8          | 2           | 3/16           | 2      |
| ISB1/4"2T  | 1/4      | 3/4          | 2-1/2       | 1/4            | 2      |
| ISB5/16"2T | 5/16     | 13/16        | 2-1/2       | 5/16           | 2      |
| ISB3/8"2T  | 3/8      | 1            | 2-1/2       | 3/8            | 2      |
| ISB1/2"2T  | 1/2      | 1            | 3           | 1/2            | 2      |
| ISB5/8"2T  | 5/8      | 1-1/4        | 3-1/2       | 5/8            | 2      |

Unit:inch



- HRC > 40
- HRC > 45
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- (Circular icons representing different flute patterns)

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼,合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金,銅 | Aluminum alloy<br>鋁合金 |
|---|-------------------------|-----------------------|--------|--------|--------|------------------------|-----------------------|-----------------------|
|   | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                       |                       |
| ◎                                       | ◎                       | ◎                     | ○      |        |        | ○                      |                       |                       |

Cutting Condition  
**P441**

## Square function type- For Aluminum - 2 flutes

### ■ 2刃鋁合金專用立銑刀



● Micro Grain Carbide

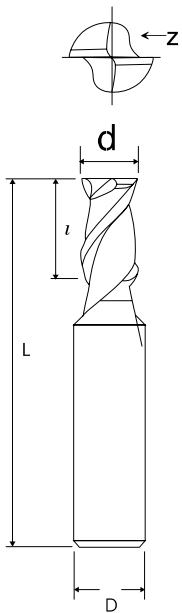
● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm

#### FRACTIONAL 英制



| MODE<br>型號      | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|-----------------|----------|--------------|-------------|----------------|--------|
|                 | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| IAE5 1/4"2 ZrN  | 1/4      | 3/4          | 2           | 1/4            | 2      |
| IAE5 5/16"2 ZrN | 5/16     | 5/8          | 2-1/2       | 5/16           | 2      |
| IAE5 3/8"2 ZrN  | 3/8      | 1-1/4        | 2-1/2       | 3/8            | 2      |
| IAE5 1/2"2 ZrN  | 1/2      | 1-1/4        | 3           | 1/2            | 2      |
| IAE5 5/8"2 ZrN  | 5/8      | 1-5/8        | 3-1/2       | 5/8            | 2      |

Unit: inch



Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                           |                       |        |        |        |                        | ○                      | ◎                     |



Cutting Condition  
**P441**

## High Feed U-Type For Aluminum

### ■ 3刃超高速鋁用立銑刀



● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



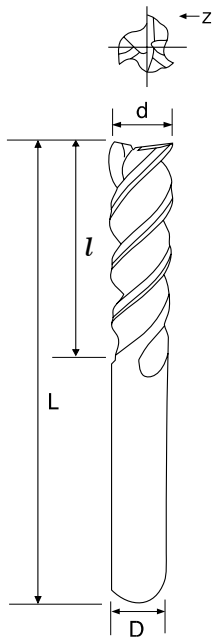
#### FRACTIONAL 英制

| MODE<br>型號 | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
|            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| IAUE1/8"3  | 1/8      | 3/8          | 1-1/2       | 1/8            | 3      |
| IAUE3/16"3 | 3/16     | 9/16         | 2           | 3/16           | 3      |
| IAUE1/4"3  | 1/4      | 3/4          | 2           | 1/4            | 3      |
| IAUE5/16"3 | 5/16     | 5/8          | 2-1/2       | 5/16           | 3      |
| IAUE3/8"3  | 3/8      | 1-1/4        | 2-1/2       | 3/8            | 3      |
| IAUE1/2"3  | 1/2      | 1-1/4        | 3           | 1/2            | 3      |
| IAUE5/8"3  | 5/8      | 1-5/8        | 3-1/2       | 5/8            | 3      |

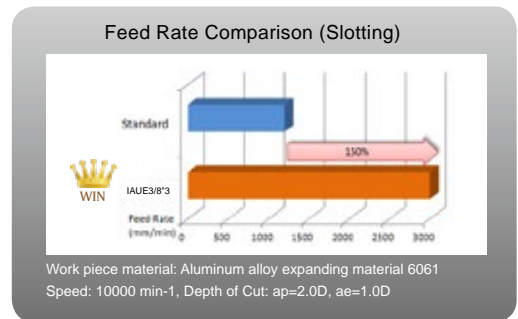
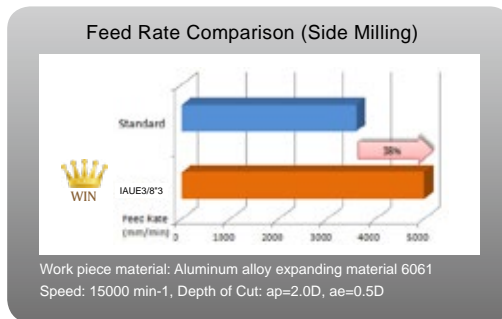
Unit:inch



IAUE video 切削影片



- ※ Special U-Type design:  
Material removal rate (MRR) and surface finishes are greatly improved due to effective chip removal at high rate.
- ※ Strong tooth with double relief angles:  
Excellent production rates become 100% possible due to the improvement of tooth hardness.
- ※ Sharp aluminum alloy tooth design. Applicable for roughing and finishing.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼,合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金,銅 | Aluminum alloy<br>鋁合金 |
|---|---------------------------|-----------------------|--------|--------|------------------------|-----------------------|-----------------------|
|   | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC |                        |                       |                       |
|   |                           |                       |        |        |                        | ◎                     | ★                     |



Cutting Condition  
**P442-447**

Unequal Flute Spacing & Helix Design 抗震系列-不等分割、不等螺旋刀型設計

Square type - 4 flutes

### ■ 4刃不等立銑刀

400  
PLUS

HRC  
55



ALTIBN

● Ultra Fine Micro Grain Carbide

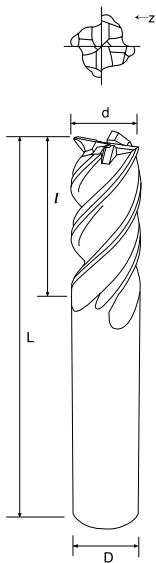
● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



#### FRACTIONAL 英制

| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|------------|----------|--------------|-------------|----------------|--------|
|            | d 直徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| IPVE1/4"4  | 1/4      | 1/2          | 2-1/2       | 1/4            | 4      |
| IPVE5/16"4 | 5/16     | 13/16        | 2-1/2       | 5/16           | 4      |
| IPVE3/8"4  | 3/8      | 7/8          | 2-1/2       | 3/8            | 4      |
| IPVE1/2"4  | 1/2      | 1            | 3           | 1/2            | 4      |
| IPVE5/8"4  | 5/8      | 1-1/4        | 3-1/2       | 5/8            | 4      |

Unit:inch



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                     | ◎      |        |        | ○                      |                        |                       |



Cutting Condition  
**P448**

Unequal Flute Spacing & Helix Design High Performance for Exotic Materials

難切削材高效刀具系列 - 不等分割、不等螺旋刀型設計

corner radius type - 4 flutes

### ■ 4刃不等圓鼻立銑刀



● Ultra Fine Micro Grain Carbide

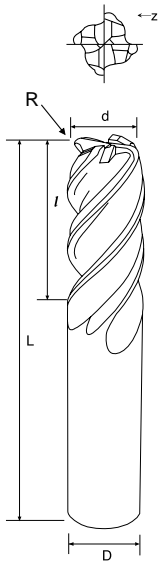
● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm<sup>2</sup> Grain Size=0.4μm



#### FRACTIONAL 英制

| MODE<br>型號         | Diameter | Corner<br>Radius | Flute Length | Full Length | Shank<br>Diameter | Flutes |
|--------------------|----------|------------------|--------------|-------------|-------------------|--------|
|                    | d        | R 角              | $\angle$     | L           | D                 | Z      |
| IPVR1T1/4"0.015"4  | 1/4      | R.015            | 9/16         | 2-1/2       | 1/4               | 4      |
| IPVR1T1/4"0.03"4   | 1/4      | R.030            | 9/16         | 2-1/2       | 1/4               | 4      |
| IPVR1T1/4"0.06"4   | 1/4      | R.060            | 9/16         | 2-1/2       | 1/4               | 4      |
| IPVR1T5/16"0.015"4 | 5/16     | R.015            | 11/16        | 2-1/2       | 5/16              | 4      |
| IPVR1T5/16"0.03"4  | 5/16     | R.030            | 11/16        | 2-1/2       | 5/16              | 4      |
| IPVR1T5/16"0.06"4  | 5/16     | R.060            | 11/16        | 2-1/2       | 5/16              | 4      |
| IPVR1T3/8"0.02"4   | 3/8      | R.020            | 13/16        | 2-1/2       | 3/8               | 4      |
| IPVR1T3/8"0.03"4   | 3/8      | R.030            | 13/16        | 2-1/2       | 3/8               | 4      |
| IPVR1T3/8"0.06"4   | 3/8      | R.060            | 13/16        | 2-1/2       | 3/8               | 4      |
| IPVR1T3/8"0.09"4   | 3/8      | R.090            | 13/16        | 2-1/2       | 3/8               | 4      |
| IPVR1T1/2"0.02"4   | 1/2      | R.020            | 1            | 3           | 1/2               | 4      |
| IPVR1T1/2"0.03"4   | 1/2      | R.030            | 1            | 3           | 1/2               | 4      |
| IPVR1T1/2"0.06"4   | 1/2      | R.060            | 1            | 3           | 1/2               | 4      |
| IPVR1T1/2"0.09"4   | 1/2      | R.090            | 1            | 3           | 1/2               | 4      |
| IPVR1T1/2"0.125"4  | 1/2      | R.125            | 1            | 3           | 1/2               | 4      |
| IPVR1T5/8"0.03"4   | 5/8      | R.030            | 1-1/4        | 3-1/2       | 5/8               | 4      |
| IPVR1T5/8"0.06"4   | 5/8      | R.060            | 1-1/4        | 3-1/2       | 5/8               | 4      |
| IPVR1T5/8"0.09"4   | 5/8      | R.090            | 1-1/4        | 3-1/2       | 5/8               | 4      |
| IPVR1T5/8"0.125"4  | 5/8      | R.125            | 1-1/4        | 3-1/2       | 5/8               | 4      |

Unit:inch



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 |        | High-hardened<br>高硬度鋼 |        |        | Stainless steel<br>不銹鋼 | Titanium alloy<br>鈦合金 | Nickel/Inconel alloy<br>鎳基合金 |
|--|---------------------------|--------|-----------------------|--------|--------|------------------------|-----------------------|------------------------------|
|  | ~45HRC                    | ~50HRC | ~55HRC                | ~60HRC | ~65HRC |                        |                       |                              |
| ◎  | ◎                         | ◎      | ◎                     |        |        | ○                      | ◎                     | ○                            |





# High Efficient Cutting System



# ST-3500

**3.5KW Induction Machine and  
Water Cooling Station**

**3.5KW 電磁感應加熱水冷機組**

**100%**  
MADE & DESIGNED  
BY SPEED TIGER

## 3.5KW Induction Machine and Water Cooling Station

### 3.5KW 電磁感應加熱水冷機組



ST-3500



ST-3500 eco

## Features 產品特點

1. Generate an alternating electromagnetic field by using 3.5KW high-frequency thermal coil. Refer to the heating time sheet, it's easy to load and unload tools just need to set the diameter and heating seconds.
2. Prolong holder life by using low-powered heating and water cooling.
3. By water-cooling with coolant, it can clean most of carbon deposits and prevent the chuck become rusty.
4. Use with Speed Tiger Shrink Fit Chucks and Power Tips Series, will show the maximum performance and economic benefits of shrink system.
5. Combine 2 functions in 1 machine: Operate heating and cooling process at one machine, i.e. no need to remove the base. Operating time within 1 minute and use friendly.

1. 採用3.5KW功率進行中週波調變，產生交流磁場，進行感應加熱。可使用內建參數表或自訂秒數進行加熱。
2. 低功率加熱，可延長刀桿壽命。更可直接淋浴式水冷。
3. 利用水冷卻方式，搭配專用冷卻劑，進而清除大部分積碳，更有效抑制刀桿生鏽。
4. 本設備搭配使用震虎燒結刀桿與斬露頭角系列產品，更可展現出燒結系統最大效益。
5. 本機採用一體式設計，燒結冷卻同一機上作業，操作方便可在一分鐘內完成作業。

| Specifications 機台規格                         | ST-3500                 | ST-3500 eco             |
|---|-------------------------|-------------------------|
| Power 功率                                    | 3.5KW                   |                         |
| Voltage 電壓                                  | 1ø220V 15A              |                         |
| Tools 適用刀具                                  | Solid Carbide 鎢鋼        |                         |
| Tool diameter 適用刀具直徑                        | 3~32mm                  |                         |
| Maximum length of shrink fit chuck 最大熱縮刀柄長度 | 300mm                   |                         |
| Dimensions 機器尺寸                             | (W)600x(L)480x(H)777 mm | (W)410x(L)480x(H)777 mm |
| Weight 機器重量                                 | 80Kg                    | 40Kg                    |

## 3.5KW Induction Machine and Water Cooling Station 3.5KW 電磁感應加熱水冷機組

### Standard Equipment 標準配件

#### Induction Unit Toolholder Base / 刀桿基座

| CODE 型號  | W 重量 (KG) | (QTY) 內含數量 | ST3500 | ST3500 eco |
|--|-----------|------------|--------|------------|
| EZ BASE NO40(FIT BT40, SK40 & CAT40)<br>(適合 BT40, SK40 & CAT40 刀桿) | 1.00      | 1PC/ 1 個   | V      | V          |

Standard Equipment include ONE piece "Toolholder base". We provide various spec. for choosing. If no specified, it will be included tool holder base fit BT40.  
標準配備內含一個刀桿基座，多種規格任您挑選。  
若無特別註明，則搭配 BT40 刀桿基座。



#### Heat Resist Gloves / 耐熱手套

| CODE 型號                 | W 重量 (KG) | (QTY) 內含數量 | ST3500 | ST3500 eco |
|-------------------------|-----------|------------|--------|------------|
| HEAT RESIST GLOVES 耐熱手套 | 0.08      | 1PC/ 1 個   | V      |            |



#### Round Tray / 熱膨脹燒結刀桿用刀具圓形放置盤

| CODE 型號                          | W 重量 (KG) | (QTY) 內含數量 | ST3500 | ST3500 eco |
|----------------------------------|-----------|------------|--------|------------|
| EZ ROUND TRAY<br>熱膨脹燒結刀桿用刀具圓形放置盤 | 0.50      | 1PC/ 1 個   | V      |            |

Suitable for EZ BASE Sxx 適用任何規格之刀桿基座



#### Shower House / 冷卻雨淋上蓋

| CODE 型號  | W 重量 (KG) | (QTY) 內含數量 | ST3500 | ST3500 eco |
|--|-----------|------------|--------|------------|
| EZ3W SHOWER HOUSE (A)<br>EZ3W 冷卻雨淋上蓋 (A)           | 1.40      | 1PC/ 1 個   | V      |            |
| EZ3W SHOWER HOUSE EXTENSION (B)<br>EZ3W 冷卻雨淋上蓋 (B) | 0.40      | 1PC/ 1 個   | V      |            |



(A) (B)  
Has been installed on ST3500  
已裝在機上

#### Coolant Liquid / 冷卻劑

| CODE 型號                                 | W 重量 (KG) | (QTY) 內含數量 | ST3500 | ST3500 eco |
|---|-----------|------------|--------|------------|
| EZ3W COOLANT LIQUID 600ML<br>冷卻劑 600 毫升 | 0.60      | 1PC/1 個    | V      |            |

EZ3W COOLANT LIQUID 600ML is for the whole tank of shower station. Use coolant liquid same as grinding machine. Recommend coolant liquid Castrol Syntilo 9930, and replace coolant liquid for all tank at every 6-12 months.  
冷卻劑 600 毫升剛好供冷卻水槽使用，EZ3W 冷卻液使用水溶性切削研磨液。  
建議使用 Castrol Syntilo 9930 水溶性切削研磨液，並每 6-12 月更換水槽冷卻液。



#### Tool Set / 工具組 0.4KG / SET

| CODE 型號                             | (QTY) 內含數量 | ST3500 | ST3500 eco |
|-------------------------------------|------------|--------|------------|
| A. Power Plug Adapter 轉換插頭          | 1PC/1 個    | V      | V          |
| B. Heating Sleeve 導熱套筒              | 1PC/1 個    | V      |            |
| C. Filter 濾網                        | 1PC/1 個    | V      |            |
| D. Stainless Steel Ruler 150mm 不鏽鋼尺 | 1PC/1 個    | V      |            |
| E. Long Nose Plier 尖嘴鉗              | 1PC/1 個    | V      |            |
| F. Slip Joint Plier 鯉魚鉗             | 1PC/1 個    | V      |            |
| G. Hex Wrench SET 六角扳手組             | 1SET/ 1 組  | V      |            |



B Heating Sleeve 導熱套筒

## 3.5KW Induction Machine and Water Cooling Station 3.5KW 電磁感應加熱水冷機組

### Optional Equipment 選擇配件

#### Toolholder Base / 刀桿基座

| STOCK 庫存 | CODE 型號                                   | W 重量 (KG) |
|----------|---|-----------|
| ◎        | EZ BASE NO20 (FIT ISO20 & ISO20G)         | 1.00      |
| ◎        | EZ BASE NO25 (FIT ISO25 & ISO25G)         | 1.00      |
| ◎        | EZ BASE NO30 (FIT BT30 & BT30G)           | 1.00      |
| ◎        | EZ BASE NO40 (FIT BT40, SK40 & CAT40)     | 1.00      |
| ◎        | EZ BASE NO50 (FIT BT50, SK50 & CAT50)     | 1.00      |
| ◎        | EZ BASE H025 (FIT HSK025)                 | 1.00      |
| ◎        | EZ BASE H032 (FIT HSK032, PSC032 & TS032) | 1.00      |
| ◎        | EZ BASE H040 (FIT HSK040, PSC040 & TS040) | 1.00      |
| ◎        | EZ BASE H050 (FIT HSK050, PSC050 & TS050) | 1.00      |
| ◎        | EZ BASE H063 (FIT HSK050, PSC050 & TS050) | 1.00      |
| ◎        | EZ BASE H080 (FIT HSK080, PSC080 & TS080) | 1.00      |
| ◎        | EZ BASE H100 (FIT HSK100, PSC100 & TS100) | 1.00      |



#### Toolholder Extension Base / 刀桿延長桿基座

| STOCK 庫存 | CODE 型號             | W 重量 (KG) |
|----------|---------------------|-----------|
| ◎        | EZ BASE S10         | 0.30      |
| ◎        | EZ BASE S12         | 0.30      |
| ◎        | EZ BASE S16         | 0.35      |
| ◎        | EZ BASE S20         | 0.35      |
| ◎        | EZ BASE S25         | 0.30      |
| ◎        | EZ BASE S32         | 0.30      |
| ◎        | EZ BASE SU03 3/8"   | 0.30      |
| ◎        | EZ BASE SU04 1/2"   | 0.30      |
| ◎        | EZ BASE SU05 5/8"   | 0.35      |
| ◎        | EZ BASE SU06 3/4"   | 0.35      |
| ◎        | EZ BASE SU10 1"     | 0.30      |
| ◎        | EZ BASE SU12 1 1/4" | 0.35      |



Toolholder Extension Base  
刀桿延長桿基座



BT40 Toolholder Base  
BT40 刀桿基座

Needs EZ BASE NO40 or EZ ROUND TRAY to operate  
需要搭配 EZ BASE NO40 或 熱膨脹燒結刀桿用刀具圓形盤放置一起使用

#### Extension for BT50 toolholder base / BT50 刀桿基座擴充配件

| STOCK 庫存 | CODE 型號                     | W 重量 (KG) |
|----------|-----------------------------|-----------|
|          | BT30 Round Tray BT30 刀桿隔環   | 0.60      |
|          | BT40 Round Tray BT40 刀桿隔環   | 0.60      |
|          | HSK30 Round Tray HSK30 刀桿隔環 | 0.60      |
|          | HSK40 Round Tray HSK40 刀桿隔環 | 0.60      |
|          | HSK50 Round Tray HSK50 刀桿隔環 | 0.60      |

BT50 toolholder base uses with these Round Tray, and then it can apply to BT30/BT40/HSK30/HSK40/HSK50 toolholder.

若您是選購 BT50 刀桿基座，搭配上隔環，即可適用 BT30/BT40/HSK30/HSK40/HSK50 刀桿。



Round Tray  
刀桿隔環



BT50 Toolholder Base  
BT50 刀桿基座

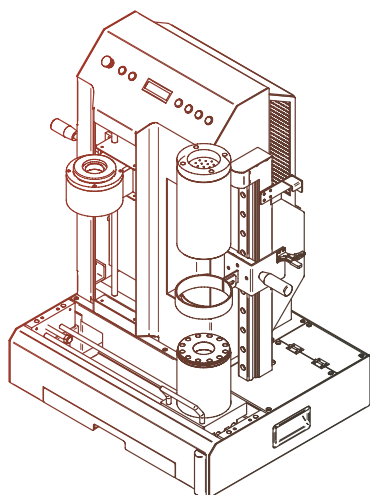
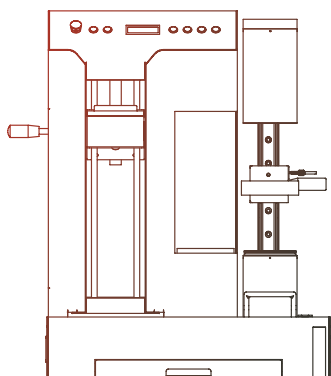
STOCK ◎ = 標準在庫品 // STOCK ○ = regular stock





**For further information of ST-3500 operation, please refer to below QR code.**

若欲進一步了解 ST-3500 電磁感應加熱水冷機組操作方式，請參閱以下 QR code.



- Introduction  
產品介紹
- Standard Mode Operation  
標準模式操作說明
  - Insert the tool  
燒結刀具
  - Take out the tool  
取出刀具操作
- Custom Mode Operation  
自選模式操作說明
- Heating Sleeve Instruction  
導熱套筒使用說明
- Shrink Fit Program for Dual End Set  
雙頭龍燒結操作說明
  - Insert the tool  
燒結刀具
  - Take out the tool  
取出刀具
- Heating Second Reference  
燒結時間參考表

Operation Manual Download  
操作手冊下載



ST3500  
Operation Video-English



ST3500  
操作影片(中文)

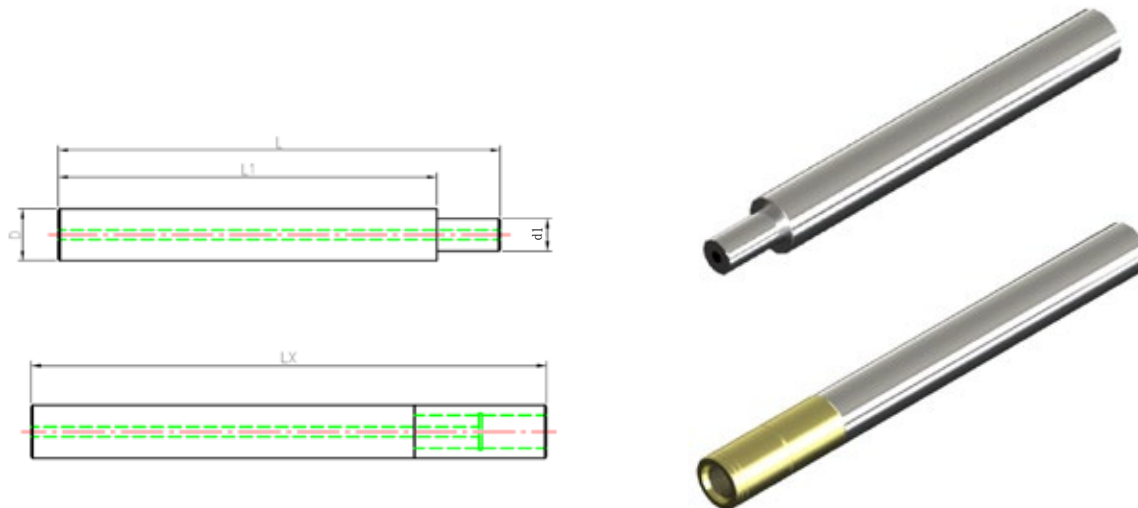


Illustration of Different Match  
雙頭龍內冷燒結抗震刀桿組各種組合示意圖



## Dual End Carbide Anti-Vibration Shrink Fit Extension

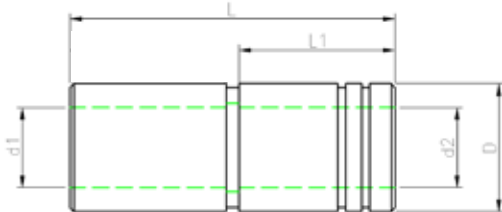
### ■ 雙頭龍鎢鋼抗震延長桿



| MODE       | Shank Diameter | d1 Front Diameter | Shank Length | Full Length | Length of Combination |
|------------|----------------|-------------------|--------------|-------------|-----------------------|
| 型號         | D 柄徑           | d1 前端柄徑           | L1 柄長        | L 總長        | LX 組合總長               |
| S1006-L120 | 10             | 6                 | 87           | 103         | 120                   |
| S1006-L160 |                |                   | 127          | 143         | 160                   |
| S1006-L200 |                |                   | 167          | 183         | 200                   |
| S1006-L300 |                |                   | 267          | 283         | 300                   |
| S1208-L120 | 12             | 8                 | 85           | 102         | 120                   |
| S1208-L160 |                |                   | 125          | 142         | 160                   |
| S1208-L200 |                |                   | 165          | 182         | 200                   |
| S1208-L300 |                |                   | 265          | 282         | 300                   |
| S1610-L120 | 16             | 10                | 79           | 99          | 120                   |
| S1610-L160 |                |                   | 119          | 139         | 160                   |
| S1610-L200 |                |                   | 159          | 179         | 200                   |
| S1610-L300 |                |                   | 259          | 279         | 300                   |
| S2012-L120 | 20             | 12                | 79           | 99          | 120                   |
| S2012-L160 |                |                   | 119          | 139         | 160                   |
| S2012-L200 |                |                   | 159          | 179         | 200                   |
| S2012-L300 |                |                   | 259          | 279         | 300                   |
| S2516-L120 | 25             | 16                | 71           | 95          | 120                   |
| S2516-L160 |                |                   | 111          | 135         | 160                   |
| S2516-L200 |                |                   | 151          | 175         | 200                   |
| S2516-L300 |                |                   | 251          | 275         | 300                   |
| S3220-L120 | 32             | 20                | 59           | 89          | 120                   |
| S3220-L160 |                |                   | 99           | 129         | 160                   |
| S3220-L200 |                |                   | 139          | 169         | 200                   |
| S3220-L300 |                |                   | 239          | 269         | 300                   |

## Adapter

### ■ 雙頭龍轉接座



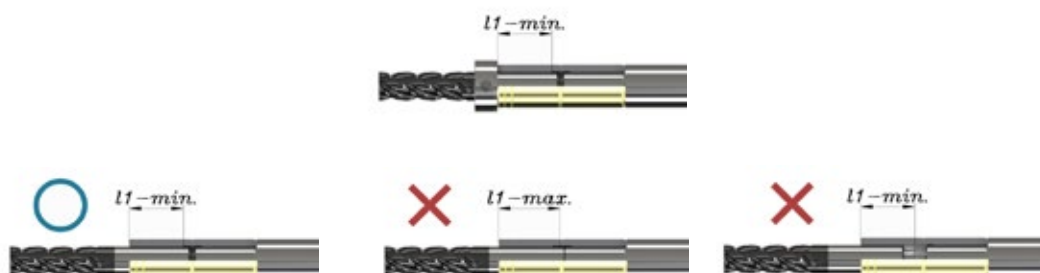
材質：SKD 鋼材  
Material: SKD Steel

| MODE               | Diameter | d1 Diameter | d2 Diameter | L1 Shrink Length<br>刀具燒結長度 |             | Full Length |
|--------------------|----------|-------------|-------------|----------------------------|-------------|-------------|
| 型號                 | D 外徑     | d1 刀桿端孔徑    | d2 刀具端孔徑    | Min. 最短燒結長度                | Max. 最長燒結長度 | L 總長        |
| SD10-EZ06-EZ04-033 | 10       | 6           | 4           | 14                         | 16          | 33          |
| SD10-EZ06-EZ06-033 |          |             | 6           | 14                         |             |             |
| SD12-EZ08-EZ04-035 | 12       | 8           | 4           | 14                         | 17          | 35          |
| SD12-EZ08-EZ06-035 |          |             | 6           | 15                         |             |             |
| SD12-EZ08-EZ08-035 |          |             | 8           | 16                         |             |             |
| SD16-EZ10-EZ06-041 | 16       | 10          | 6           | 15                         | 20          | 41          |
| SD16-EZ10-EZ08-041 |          |             | 8           | 16                         |             |             |
| SD16-EZ10-EZ10-041 |          |             | 10          | 19                         |             |             |
| SD20-EZ12-EZ08-041 | 20       | 12          | 8           | 16                         | 20          | 41          |
| SD20-EZ12-EZ10-041 |          |             | 10          | 19                         |             |             |
| SD20-EZ12-EZ12-041 |          |             | 12          | 19                         |             |             |
| SD25-EZ16-EZ10-049 | 25       | 16          | 10          | 19                         | 24          | 49          |
| SD25-EZ16-EZ12-049 |          |             | 12          | 19                         |             |             |
| SD25-EZ16-EZ16-049 |          |             | 16          | 23                         |             |             |
| SD32-EZ20-EZ12-061 | 32       | 20          | 12          | 19                         | 30          | 61          |
| SD32-EZ20-EZ16-061 |          |             | 16          | 23                         |             |             |
| SD32-EZ20-EZ20-061 |          |             | 20          | 29                         |             |             |

獲台灣專利 字號：新型第 M 515426 號  
Patent of Taiwan No.: M 515426  
獲中國專利 字號：201520716712.3  
Patent of China No.: 201520716712.3

屬於高溫作業，操作時需要全程穿戴耐熱手套。  
小孔徑 4 在刀具交換時，每次都需要清潔刀桿內孔。  
6 孔徑以上在刀具交換 10 次時，需要清潔刀桿內孔 1 次。  
錯誤的刀具夾持長度將會“永久”損壞熱膨脹燒結刀桿內孔。  
刀具端面與鎢鋼柄端面貼合將會影響精度。  
可使用刀刀固定器，設定夾持長度。

Wear heat resist gloves during the operation of heating tool change  
Clean the bore every time tool change for 3, 4 & 5 mm  
Clean the bore once for every 10 times tool change tool for 6mm and above  
Wrong clamping length will damage the shrink fit chucks "FOREVER"  
Precision will be affected when tool contact with Carbide Fit Extension  
Use ezShrink cutter shank holder set up clamping length



Fixture of Heating

■ 燒結加熱治具

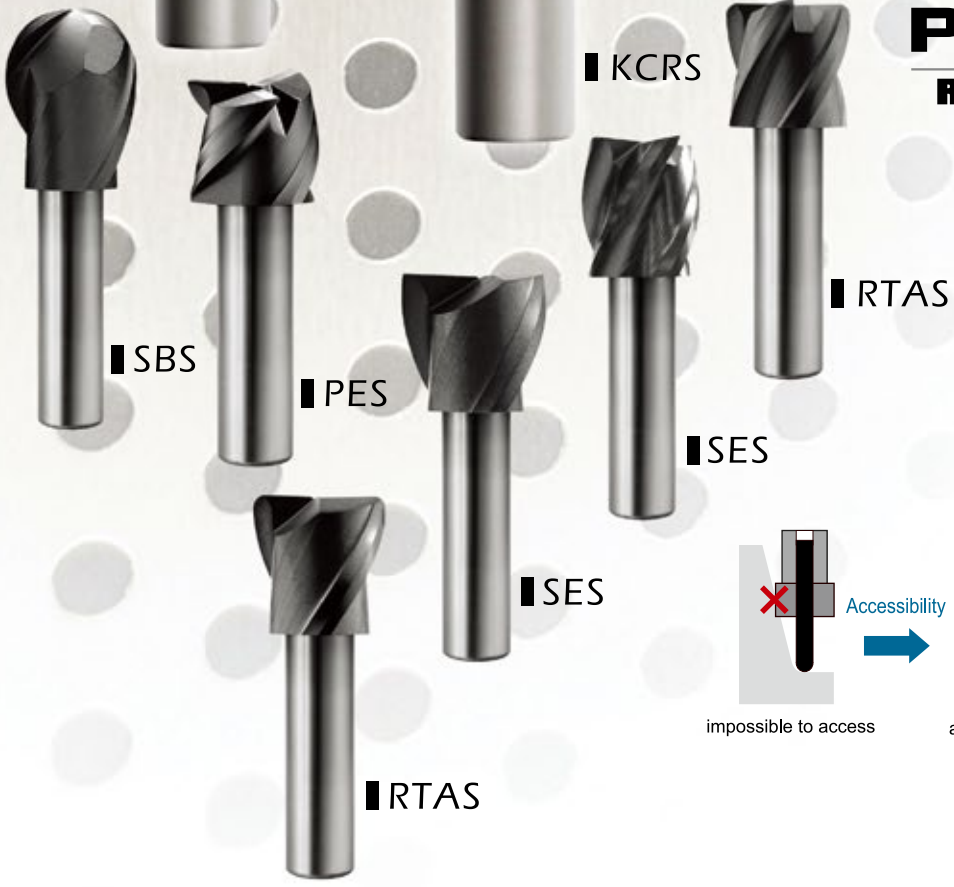


| MODE 品名  | d1  | d2 | L   | L1 | D  |
|--|-----|----|-----|----|----|
| Fixture of Heating 燒結加熱治具<br>Order No. 品號 D07250110101 | 3.8 | 25 | 120 | 29 | 20 |

Unit: mm



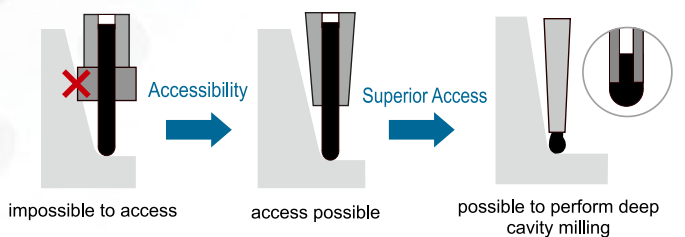
**Insert Price  
End Mill Function  
& Performance**



**Power Tips**  
Replaceable End Mills Head  
可替換刀頭立銼刀



video 切削影片



SBS 2 刃

切削  
條件表 **P347-348**  
Cutting Condition

SBS 4 刃

切削  
條件表 **P449**  
Cutting Condition

## SBS Ball Nose Tip - 2 & 4 flutes

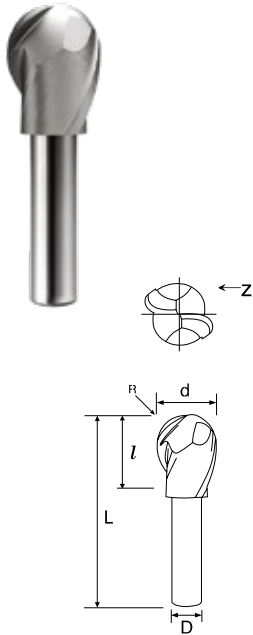
### ■ 球形刀頭2刃/4刃

600  
Nano

HRC  
▶ 50

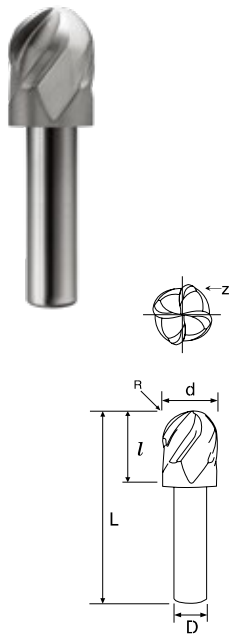
35°

nACRo



#### 2 Flutes - 2 刃

| MODE          | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------|--------------|-------------|----------------|--------|
| 型號            | d 刀徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SBS0802 nACRo | 8        | 4      | 6            | 20          | 6              | 2      |
| SBS1002 nACRo | 10       | 5      | 8            | 24          | 6              | 2      |
| SBS1102 nACRo | 11       | 5.5    | 8            | 24          | 6              | 2      |
| SBS1202 nACRo | 12       | 6      | 9            | 26          | 6              | 2      |
| SBS1302 nACRo | 13       | 6.5    | 9            | 26          | 6              | 2      |
| SBS1602 nACRo | 16       | 8      | 12           | 32          | 10             | 2      |
| SBS1702 nACRo | 17       | 8.5    | 12           | 32          | 10             | 2      |
| SBS2002 nACRo | 20       | 10     | 15           | 35          | 12             | 2      |
| SBS2102 nACRo | 21       | 10.5   | 15           | 35          | 12             | 2      |



#### 4 Flutes - 4 刃

| MODE          | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------|--------------|-------------|----------------|--------|
| 型號            | d 刀徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| SBS0804 nACRo | 8        | 4      | 6            | 20          | 6              | 4      |
| SBS1004 nACRo | 10       | 5      | 8            | 24          | 6              | 4      |
| SBS1204 nACRo | 12       | 6      | 9            | 26          | 6              | 4      |
| SBS1604 nACRo | 16       | 8      | 12           | 32          | 10             | 4      |
| SBS2004 nACRo | 20       | 10     | 15           | 35          | 12             | 4      |

Application 適用材質:

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                  | -50HRC             | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                  | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm



RTAS 2 刃

切削  
條件表 **P450**  
Cutting Condition

RTAS 4 刃

切削  
條件表 **P451**  
Cutting Condition

## RTAS Corner Radius Tip - 2 & 4 flutes

### ■ 圓鼻刀頭 2 刃 / 4 刃

600  
Nano

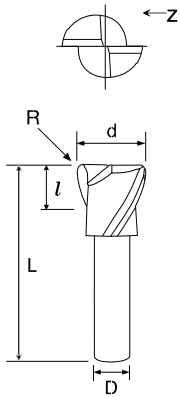
HRC  
▶ 50

35°

nACRo

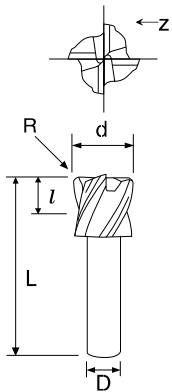
R

### 2 Flutes - 2 刃



| MODE             | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|------------------|----------|---------------|--------------|-------------|----------------|--------|
| 型號               | d 刀徑     | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| RTAS080052 nACRo | 8        | 0.5           | 6            | 20          | 6              | 2      |
| RTAS080102 nACRo | 8        | 1             | 6            | 20          | 6              | 2      |
| RTAS080202 nACRo | 8        | 2             | 6            | 20          | 6              | 2      |
| RTAS100052 nACRo | 10       | 0.5           | 8            | 24          | 6              | 2      |
| RTAS100102 nACRo | 10       | 1             | 8            | 24          | 6              | 2      |
| RTAS100202 nACRo | 10       | 2             | 8            | 24          | 6              | 2      |
| RTAS110052 nACRo | 11       | 0.5           | 8            | 24          | 6              | 2      |
| RTAS110102 nACRo | 11       | 1             | 8            | 24          | 6              | 2      |
| RTAS120052 nACRo | 12       | 0.5           | 9            | 26          | 6              | 2      |
| RTAS120102 nACRo | 12       | 1             | 9            | 26          | 6              | 2      |
| RTAS120202 nACRo | 12       | 2             | 9            | 26          | 6              | 2      |
| RTAS130052 nACRo | 13       | 0.5           | 9            | 26          | 6              | 2      |
| RTAS130102 nACRo | 13       | 1             | 9            | 26          | 6              | 2      |
| RTAS160102 nACRo | 16       | 1             | 12           | 32          | 10             | 2      |
| RTAS160202 nACRo | 16       | 2             | 12           | 32          | 10             | 2      |
| RTAS160302 nACRo | 16       | 3             | 12           | 32          | 10             | 2      |
| RTAS170052 nACRo | 17       | 0.5           | 12           | 32          | 10             | 2      |
| RTAS170102 nACRo | 17       | 1             | 12           | 32          | 10             | 2      |
| RTAS200102 nACRo | 20       | 1             | 15           | 35          | 12             | 2      |
| RTAS200202 nACRo | 20       | 2             | 15           | 35          | 12             | 2      |
| RTAS200302 nACRo | 20       | 3             | 15           | 35          | 12             | 2      |
| RTAS210052 nACRo | 21       | 0.5           | 15           | 35          | 12             | 2      |
| RTAS210102 nACRo | 21       | 1             | 15           | 35          | 12             | 2      |

### 4 Flutes - 4 刃



| MODE             | Diameter | Corner Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|------------------|----------|---------------|--------------|-------------|----------------|--------|
| 型號               | d 刀徑     | R 角           | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| RTAS080054 nACRo | 8        | 0.5           | 6            | 20          | 6              | 4      |
| RTAS080104 nACRo | 8        | 1             | 6            | 20          | 6              | 4      |
| RTAS080204 nACRo | 8        | 2             | 6            | 20          | 6              | 4      |
| RTAS100054 nACRo | 10       | 0.5           | 8            | 24          | 6              | 4      |
| RTAS100104 nACRo | 10       | 1             | 8            | 24          | 6              | 4      |
| RTAS100204 nACRo | 10       | 2             | 8            | 24          | 6              | 4      |
| RTAS120054 nACRo | 12       | 0.5           | 9            | 26          | 6              | 4      |
| RTAS120104 nACRo | 12       | 1             | 9            | 26          | 6              | 4      |
| RTAS120204 nACRo | 12       | 2             | 9            | 26          | 6              | 4      |
| RTAS160104 nACRo | 16       | 1             | 12           | 32          | 10             | 4      |
| RTAS160204 nACRo | 16       | 2             | 12           | 32          | 10             | 4      |
| RTAS160304 nACRo | 16       | 3             | 12           | 32          | 10             | 4      |
| RTAS200104 nACRo | 20       | 1             | 15           | 35          | 12             | 4      |
| RTAS200204 nACRo | 20       | 2             | 15           | 35          | 12             | 4      |
| RTAS200304 nACRo | 20       | 3             | 15           | 35          | 12             | 4      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                  | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm



切削條件表  
**P452**  
 Cutting Condition

## SES Square Tip - 2 & 4 flutes

### ■ 平刀頭 2 刃 / 4 刃

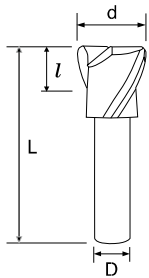
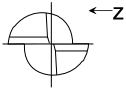
600  
Nano

HRC  
▶ 45

35°

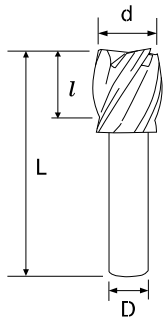
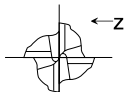
nACRo

#### 2 Flutes - 2 刃



| MODE          | Diameter | Flute Length | Shank Diameter | Full Length | Flutes |
|---------------|----------|--------------|----------------|-------------|--------|
| 型號            | d 刀徑     | l 刃長         | D 柄徑           | L 全長        | Z 刃數   |
| SES0802 nACRo | 8        | 6            | 6              | 20          | 2      |
| SES1002 nACRo | 10       | 8            | 6              | 24          | 2      |
| SES1202 nACRo | 12       | 9            | 6              | 26          | 2      |
| SES1602 nACRo | 16       | 12           | 10             | 32          | 2      |
| SES2002 nACRo | 20       | 15           | 12             | 35          | 2      |

#### 4 Flutes - 4 刃



| MODE          | Diameter | Flute Length | Shank Diameter | Full Length | Flutes |
|---------------|----------|--------------|----------------|-------------|--------|
| 型號            | d 刀徑     | l 刃長         | D 柄徑           | L 全長        | Z 刃數   |
| SES0804 nACRo | 8        | 6            | 6              | 20          | 4      |
| SES1004 nACRo | 10       | 8            | 6              | 24          | 4      |
| SES1204 nACRo | 12       | 9            | 6              | 26          | 4      |
| SES1604 nACRo | 16       | 12           | 10             | 32          | 4      |
| SES2004 nACRo | 20       | 15           | 12             | 35          | 4      |

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  | ○      | ○      |        |                        |                        |                       |

Unit/單位: mm



切削條件表  
**P453**  
 Cutting Condition

### PES Square Tip - 3 flutes

## ■ 平刀頭 3 刃 45°

600  
Nano

HRC  
▶ 45

45°

nACRo



| MODE          | Diameter | Flute Length | Shank Diameter | Full Length | Flutes |
|---------------|----------|--------------|----------------|-------------|--------|
| 型號            | d 刃徑     | l 刃長         | D 柄徑           | L 全長        | Z 刃數   |
| PES0803 nACRo | 8        | 6            | 6              | 20          | 3      |
| PES1003 nACRo | 10       | 8            | 6              | 24          | 3      |
| PES1103 nACRo | 11       | 8            | 6              | 24          | 3      |
| PES1203 nACRo | 12       | 9            | 6              | 26          | 3      |
| PES1303 nACRo | 13       | 9            | 6              | 26          | 3      |
| PES1603 nACRo | 16       | 12           | 10             | 32          | 3      |
| PES1703 nACRo | 17       | 12           | 10             | 32          | 3      |
| PES2003 nACRo | 20       | 15           | 12             | 35          | 3      |
| PES2103 nACRo | 21       | 15           | 12             | 35          | 3      |

HRC  
▶ 40

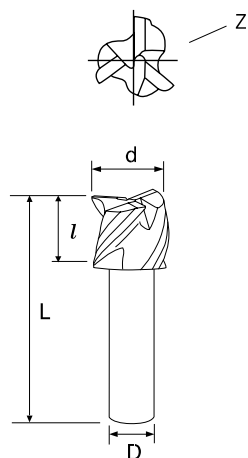
HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  | ○      |        |        |                        |                        |                       |

Unit/單位: mm

**AES5 2 刃**

切削  
條件表 **P454**  
Cutting Condition

**AES5 3 刃**

切削  
條件表 **P455**  
Cutting Condition

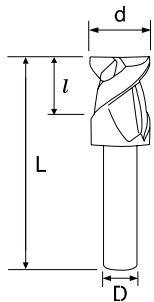
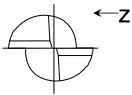
## AES5 Square Tip - For Aluminum Alloy - 2 & 3 flutes

### ■ 鋁用刀頭 2 刃 / 3 刃

**600**  
Nano

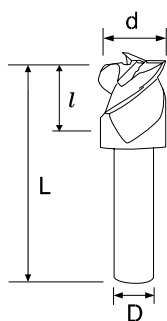
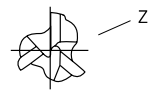
**HRC**  
▶ 40

**55°**



#### 2 Flutes - 2 刃

| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刀徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AES50802 | 8        | 6            | 20          | 6              | 2      |
| AES51002 | 10       | 8            | 24          | 6              | 2      |
| AES51202 | 12       | 9            | 26          | 6              | 2      |
| AES51602 | 16       | 12           | 32          | 10             | 2      |
| AES52002 | 20       | 15           | 35          | 12             | 2      |



#### 3 Flutes - 3 刃

| MODE     | Diameter | Flute Length | Full Length | Shank Diameter | Flutes |
|----------|----------|--------------|-------------|----------------|--------|
| 型號       | d 刀徑     | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| AES50803 | 8        | 6            | 20          | 6              | 3      |
| AES51003 | 10       | 8            | 24          | 6              | 3      |
| AES51203 | 12       | 9            | 26          | 6              | 3      |
| AES51603 | 16       | 12           | 32          | 10             | 3      |
| AES52003 | 20       | 15           | 35          | 12             | 3      |

#### 產品特點

鋁加工專用立銑刀

採用 55° 螺旋角之設計，使排屑順暢；高速加工時不易發生顫動，可提升加工精度。

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
|  |                         |                    |        |        |        |                        | ◎                      | ◎                     |

Unit/單位: mm

切削  
條件表 **P456-457**  
Cutting Condition

## FHPCS Heavy-duty - 4 flutes

### ■ 重切削平刀頭 4 刃

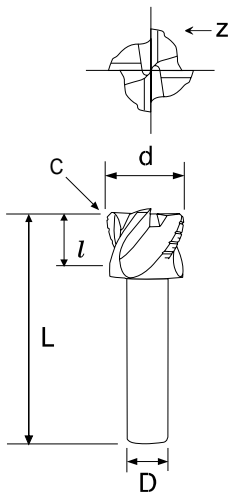
400  
Nano

HRC  
▶ 50

45°

nACRo

45°



| MODE           | Diameter | Flute Length | Shank Diameter | Full Length | Helix Angle | Flutes |
|----------------|----------|--------------|----------------|-------------|-------------|--------|
| 型號             | d 刃徑     | l 刃長         | D 柄徑           | L 全長        | 螺旋角度        | Z 刃數   |
| FHPCS080 nACRo | 8        | 6            | 6              | 20          | 45°         | 4      |
| FHPCS100 nACRo | 10       | 8            | 6              | 24          | 45°         | 4      |
| FHPCS120 nACRo | 12       | 9            | 6              | 26          | 45°         | 4      |
| FHPCS160 nACRo | 16       | 12           | 10             | 32          | 45°         | 4      |
| FHPCS200 nACRo | 20       | 15           | 12             | 35          | 45°         | 4      |

### Details 產品特點

The FHPCS endmill features 4 flutes with a 45° helix, four serrated flutes and four continuous flutes.

The tool is fully effective and enables running at rough machining parameters, resulting in finish surface quality.

The unique tool design reduces vibration at high load applications.

The tool produces short and long chips simultaneously.

This chip mixture is evacuated more easily than each individual chip type an excellent solution in slotting and cavity milling applications.

One tool change and setup time can be eliminated.

A single tool replaces the roughing and finishing endmills, dramatically reducing cycle time and increasing productivity.

Extra tool position is gained on the machine.

Eliminates the need to keep a large amount of stock.

Superior nACRo nano metallic element coating.

4 flutes : 4 serrated plus 4 continuous flutes.

Excellent performance and tool life.

Suitable for all types of steel.

Excellent performance in machining titanium, Inconel, stainless steel and high temperature alloys.

FHPCS 立銑刀，45° 螺旋角，4 螺旋刃，4 螺旋刃帶鋸齒，4 光滑螺旋刃

高效刀具，粗加工的切削參數，精加工的表面質量

獨特設計減小了高負荷下刀具的振顫；有不等斷削槽設計

短小切屑及長切屑同時產生，長短混合的切屑比單一類型的切屑更易於排出，

是槽銑加工及型腔銑削的出色解決方案

僅一把刀具，無調試時間

僅一把銑刀就完成了粗銑及精銑加工，出色地減少了加工週期及提高了生產率

刀庫中多了一個安裝其他刀具的刀位

當銑刀規格繁多時，會很明顯地為您減少庫存量

最頂尖的 nACRo 奈米金屬三元素薄膜

4 個螺旋刃，4 螺旋刃帶鋸齒，4 光滑螺旋刃

表現卓越，刀具壽命長

適用於所有類型的鋼製品加工

加工鈦合金，鎳鉻鐵合金 (inconel)，不銹鋼及高溫合金時，表現不凡

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        |  | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|--|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |  |                        |                        |                       |
| ◎  | ◎                         | ◎                  | ○      |        |        |  |                        |                        |                       |

Unit/單位: mm

切削  
條件表 **P458-460**  
Cutting Condition

### KTGS Ball Nose Tip - Super high & hardness - 2 flutes

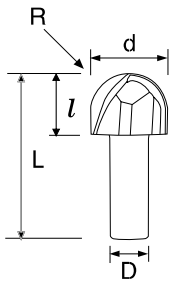
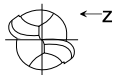
## ■ 超高速、超高硬度切削球形刀頭 2 刃

200  
Nano

HRC  
▶ 60

5°

nACo



| MODE          | Diameter | Radius | Flute Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|--------|--------------|-------------|----------------|--------|
| 型號            | d 刃徑     | R 值    | l 刃長         | L 全長        | D 柄徑           | Z 刃數   |
| KTGS0802 nACo | 8        | 4      | 6            | 20          | 6              | 2      |
| KTGS1002 nACo | 10       | 5      | 8            | 24          | 6              | 2      |
| KTGS1202 nACo | 12       | 6      | 9            | 26          | 6              | 2      |
| KTGS1602 nACo | 16       | 8      | 12           | 32          | 10             | 2      |
| KTGS2002 nACo | 20       | 10     | 15           | 35          | 12             | 2      |

### 產品特點

採用先進奈米晶格 nACo 塗層，擁有高附著性和高硬度

長壽命 工具壽命大大提升

高精度 尺寸變化極少，精加工最適合

最新幾何刀刃形狀，擁有最高剛性保證，高精度 R 值

高能率 強力重切削粗加工可行

高精度 高精度超精密加工

KTGS nACo 系列強而有力的表現在形形色色的材質加工，從預熱鋼 HRC45 到高硬度鋼 HRC65 特別應用在預熱鋼切削 KTGS nACo 表現出無與倫比的超長壽命，非一般刀具能比（超過一般 TiAlN3 倍以上壽命）

R 精度 ±0.01mm 以下，尺寸磨耗小，高精密度精加工可行

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ◎                  | ◎      | ◎      |        |                        |                        |                       |

Unit/單位: mm

切削條件表 **P461-462**  
Cutting Condition

### KCRS Corner Radius Tip - Super high speed & high hardness - 4 flute

200  
Nano

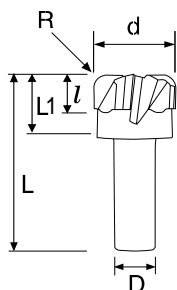
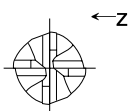
HRC  
▶ 55

5°

nACo

R

## ■ 超高速、超高硬度切削圓鼻刀頭 4 刃



| MODE          | Diameter | Corner Radius | Flute Length | Efficient Length | Full Length | Shank Diameter | Flutes |
|---------------|----------|---------------|--------------|------------------|-------------|----------------|--------|
| 型號            | d 刃徑     | R 角           | ℓ 刃長         | L1 有效長           | L 全長        | D 柄徑           | Z 刃數   |
| KCRS0805 nACo | 8        | 0.5           | 3.5          | 6                | 20          | 6              | 4      |
| KCRS0810 nACo | 8        | 1             | 3.5          | 6                | 20          | 6              | 4      |
| KCRS0820 nACo | 8        | 2             | 3.5          | 6                | 20          | 6              | 4      |
| KCRS1005 nACo | 10       | 0.5           | 4            | 8                | 24          | 6              | 4      |
| KCRS1010 nACo | 10       | 1             | 4            | 8                | 24          | 6              | 4      |
| KCRS1020 nACo | 10       | 2             | 4            | 8                | 24          | 6              | 4      |
| KCRS1210 nACo | 12       | 1             | 5            | 9                | 26          | 6              | 4      |
| KCRS1220 nACo | 12       | 2             | 5            | 9                | 26          | 6              | 4      |
| KCRS1230 nACo | 12       | 3             | 5            | 9                | 26          | 6              | 4      |
| KCRS1610 nACo | 16       | 1             | 7            | 12               | 32          | 10             | 4      |
| KCRS1620 nACo | 16       | 2             | 7            | 12               | 32          | 10             | 4      |
| KCRS1630 nACo | 16       | 3             | 7            | 12               | 32          | 10             | 4      |

### 產品特點

採用先進奈米晶格 nACo 塗層，擁有高附著性和高硬度

長壽命 工具壽命大大提升

高精度 尺寸變化極少，精加工最適合

最新幾何刀刃形狀，擁有最高剛性保證，高精度 R 值

高能率 強力重切削粗加工可行

高精度 高精度超精密加工

KCRS nACo 系列強而有力的表現在形形色色的材質加工，從預熱鋼 HRC45 到高硬度鋼 HRC65 特別應用在模具銑削 KCRS nACo 表現出無與倫比的超高速精度粗加工

(超過一般圓鼻刀 3 倍以上效率)

R 精度 ±0.01mm 以下，尺寸磨耗小，高精密度精加工可行

Application 適用材質：

★ Perfect 最推薦

◎ Excellent 適合

○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                  | ◎      | ○      |        |                        |                        |                       |

Unit/單位: mm



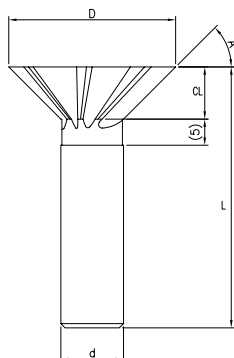
## Dovetail Cutter

### ■ 鳩尾刀



| MODE       | Diameter | Cutting Length | Length after Shrink | Angle | Shank Diameter | Full Length | Flutes |
|------------|----------|----------------|---------------------|-------|----------------|-------------|--------|
| 型號         | D 外徑     | CL 刃長          | 燒結後伸出長              | A 角度  | d 柄徑           | L 全長        | Z 刃數   |
| TAMS160045 | 16       | 4              | 19                  | 45°   | 10             | 40          | 6      |
| TAMS200045 | 20       | 5              | 19                  |       | 10             | 40          | 6      |
| TAMS250045 | 25       | 6.3            | 24                  |       | 12             | 45          | 6      |
| TAMS320045 | 32       | 8              | 29                  |       | 12             | 50          | 8      |
| TAMS160060 | 16       | 6.3            | 19                  | 60°   | 10             | 40          | 6      |
| TAMS200060 | 20       | 8              | 19                  |       | 10             | 40          | 6      |
| TAMS250060 | 25       | 10             | 24                  |       | 12             | 45          | 6      |
| TAMS320060 | 32       | 12.5           | 29                  |       | 12             | 50          | 8      |

特殊規格可依需求接單生產  
 Make to order for special requests is available.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm

切削條件表  
**P467**  
 Cutting Condition

### Position Chamfer Cutter

## ■ 定位倒角刀

600  
Nano

HRC  
45

25°

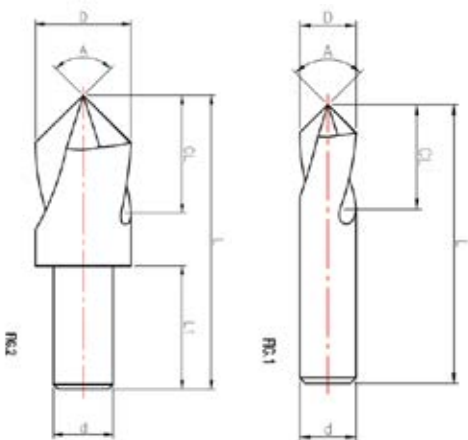
ALTIBN



| MODE        | Diameter | Angle | Cutting Length | Shank Length | Shank Diameter | Full Length | Flutes | FIG |
|-------------|----------|-------|----------------|--------------|----------------|-------------|--------|-----|
| 型號          | D 刃徑     | A 角度  | CL 刃長          | L1 柄長        | d 柄徑           | L 全長        | Z 刃數   | FIG |
| PDSTS040600 | 4        | 60°   | 8              | -            | 4              | 40          | 2      | 1   |
| PDSTS060600 | 6        |       | 12             | -            | 6              | 40          | 2      | 1   |
| PDSTS080600 | 8        |       | 15             | -            | 8              | 40          | 2      | 1   |
| PDSTS100600 | 10       |       | 15             | -            | 10             | 40          | 2      | 1   |
| PDSTS120600 | 12       |       | 15             | -            | 12             | 40          | 2      | 1   |
| PDSTS160600 | 16       |       | 20             | 20           | 10             | 50          | 2      | 2   |
| PDSTS200600 | 20       |       | 20             | 20           | 10             | 50          | 2      | 2   |
| PDSTS040900 | 4        | 90°   | 8              | -            | 4              | 40          | 2      | 1   |
| PDSTS060900 | 6        |       | 12             | -            | 6              | 40          | 2      | 1   |
| PDSTS080900 | 8        |       | 15             | -            | 8              | 40          | 2      | 1   |
| PDSTS100900 | 10       |       | 15             | -            | 10             | 40          | 2      | 1   |
| PDSTS120900 | 12       |       | 15             | -            | 12             | 40          | 2      | 1   |
| PDSTS160900 | 16       |       | 20             | 20           | 10             | 50          | 2      | 2   |
| PDSTS200900 | 20       |       | 20             | 20           | 10             | 50          | 2      | 2   |
| PDSTS040120 | 4        | 120°  | 8              | -            | 4              | 40          | 2      | 1   |
| PDSTS060120 | 6        |       | 12             | -            | 6              | 40          | 2      | 1   |
| PDSTS080120 | 8        |       | 15             | -            | 8              | 40          | 2      | 1   |
| PDSTS100120 | 10       |       | 15             | -            | 10             | 40          | 2      | 1   |
| PDSTS120120 | 12       |       | 15             | -            | 12             | 40          | 2      | 1   |
| PDSTS160120 | 16       |       | 20             | 20           | 10             | 50          | 2      | 2   |
| PDSTS200120 | 20       |       | 20             | 20           | 10             | 50          | 2      | 2   |

特殊規格可依需求接單生產

Make to order for special requests is available.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm





### Corner Rounding Cutter

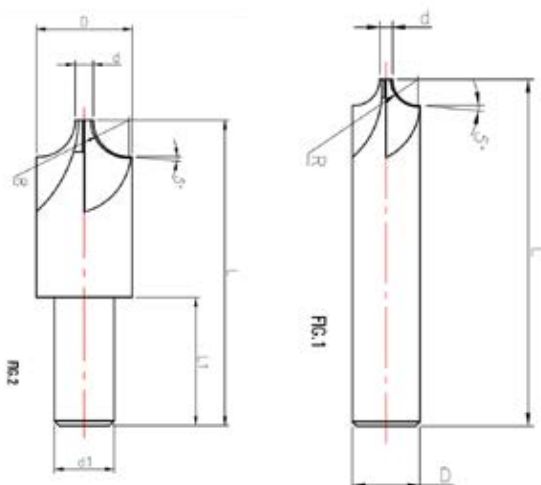


## ■ 外 R 刀



| MODE      | Corner Radius | Diameter | Diameter | Diameter | Shank Length | Full Length | Flutes | FIG |
|-----------|---------------|----------|----------|----------|--------------|-------------|--------|-----|
| 型號        | R值            | d 先端徑    | D 外徑     | d1 柄徑    | L1 柄長        | L 全長        | Z 刃數   | FIG |
| RCS015054 | 0.5           | 1.5      | 4        | -        | -            | 40          | 4      | 1   |
| RCS015104 | 1             | 1.5      | 4        | -        | -            | 40          | 4      | 1   |
| RCS015154 | 1.5           | 1.5      | 6        | -        | -            | 40          | 4      | 1   |
| RCS015204 | 2             | 1.5      | 6        | -        | -            | 40          | 4      | 1   |
| RCS015304 | 3             | 1.5      | 8        | -        | -            | 40          | 4      | 1   |
| RCS020404 | 4             | 2        | 12       | -        | -            | 40          | 4      | 1   |
| RCS030504 | 5             | 3        | 16       | 10       | 20           | 50          | 4      | 2   |
| RCS030604 | 6             | 3        | 16       | 10       | 20           | 50          | 4      | 2   |

特殊規格可依需求接單生產  
Make to order for special requests is available.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm



## Double Chamfer Cutter

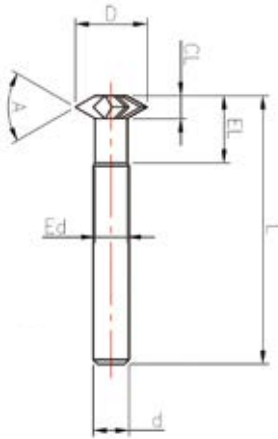
### ■ 雙面倒角刀



| MODE       | Diameter | Angle | Cutting Length | Efficient Diameter | Efficient Length | Shank Diameter | Full Length | Flutes |
|------------|----------|-------|----------------|--------------------|------------------|----------------|-------------|--------|
| 型號         | D 刀徑     | A 角度  | CL 刀長          | 頸徑 (Ed)            | 頸長 (EL)          | d 柄徑           | L 全長        | Z 刃數   |
| TMAS080060 | 8        | 60°   | 2.5            | 3.6                | 5                | 4              | 50          | 4      |
| TMAS100060 | 10       |       | 3.2            | 3.6                | 6                | 4              | 50          | 6      |
| TMAS120060 | 12       |       | 3.8            | 5.4                | 7                | 6              | 50          | 6      |
| TMAS160060 | 16       |       | 5.1            | 7.2                | 9                | 6              | 50          | 6      |
| TMAS200060 | 20       |       | 6.3            | 9                  | 11               | 10             | 50          | 8      |
| TMAS080090 | 8        | 90°   | 4              | 3.6                | 9                | 4              | 50          | 4      |
| TMAS100090 | 10       |       | 6              | 3.6                | 11               | 4              | 50          | 6      |
| TMAS120090 | 12       |       | 6              | 5.4                | 11               | 6              | 50          | 6      |
| TMAS160090 | 16       |       | 8              | 7.2                | 13               | 8              | 50          | 6      |
| TMAS200090 | 20       |       | 10             | 9                  | 15               | 10             | 50          | 8      |

特殊規格可依需求接單生產

Make to order for special requests is available.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

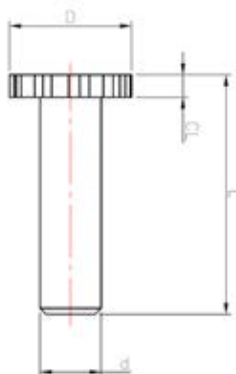
| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                         | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm



## Keyseat Cutter

### ■ 鍵槽刀



| MODE      | Diameter | Cutting Length | Length after Shrink | Shank Diameter | Full Length | Flutes |
|-----------|----------|----------------|---------------------|----------------|-------------|--------|
| 型號        | D 刀徑     | CL 刃長          | 燒結後伸出長              | d 柄徑           | L 全長        | Z 刃數   |
| TMTS08010 | 8        | 1              | 13                  | 4              | 30          | 6      |
| TMTS08015 |          | 1.5            | 13                  |                | 30          | 6      |
| TMTS08020 |          | 2              | 13                  |                | 30          | 6      |
| TMTS10010 | 10       | 1              | 13                  | 4              | 30          | 6      |
| TMTS10015 |          | 1.5            | 13                  |                | 30          | 6      |
| TMTS10020 |          | 2              | 13                  |                | 30          | 6      |
| TMTS12010 | 12       | 1              | 13                  | 6              | 30          | 6      |
| TMTS12015 |          | 1.5            | 13                  |                | 30          | 6      |
| TMTS12020 |          | 2              | 13                  |                | 30          | 6      |
| TMTS16010 | 16       | 1              | 12                  | 8              | 30          | 8      |
| TMTS16015 |          | 1.5            | 12                  |                | 30          | 8      |
| TMTS16020 |          | 2              | 12                  |                | 30          | 8      |
| TMTS16025 |          | 2.5            | 12                  |                | 30          | 8      |
| TMTS16030 |          | 3              | 12                  |                | 30          | 8      |
| TMTS20010 | 20       | 1              | 14                  | 10             | 35          | 8      |
| TMTS20015 |          | 1.5            | 14                  |                | 35          | 8      |
| TMTS20020 |          | 2              | 14                  |                | 35          | 8      |
| TMTS20025 |          | 2.5            | 14                  |                | 35          | 8      |
| TMTS20030 |          | 3              | 14                  |                | 35          | 8      |
| TMTS20050 |          | 5              | 19                  |                | 40          | 8      |
| TMTS20060 |          | 6              | 19                  |                | 40          | 8      |
| TMTS20070 |          | 7              | 24                  |                | 45          | 8      |
| TMTS20080 | 8        | 24             | 45                  | 8              |             |        |
| TMTS25010 | 25       | 1              | 14                  | 12             | 35          | 10     |
| TMTS25020 |          | 2              | 14                  |                | 35          | 10     |
| TMTS25025 |          | 2.5            | 14                  |                | 35          | 10     |
| TMTS25030 |          | 3              | 14                  |                | 35          | 10     |
| TMTS25050 |          | 5              | 19                  |                | 40          | 10     |
| TMTS25060 |          | 6              | 19                  |                | 40          | 10     |
| TMTS25070 |          | 7              | 24                  |                | 45          | 10     |
| TMTS25080 |          | 8              | 24                  |                | 45          | 10     |
| TMTS30010 | 30       | 1              | 10                  | 16             | 35          | 10     |
| TMTS30020 |          | 2              | 10                  |                | 35          | 10     |
| TMTS30030 |          | 3              | 10                  |                | 35          | 10     |
| TMTS30040 |          | 4              | 10                  |                | 35          | 10     |
| TMTS30050 |          | 5              | 15                  |                | 40          | 10     |
| TMTS30060 |          | 6              | 15                  |                | 40          | 10     |
| TMTS30070 |          | 7              | 20                  |                | 45          | 10     |
| TMTS30080 |          | 8              | 20                  |                | 45          | 10     |

特殊規格可依需求接單生產  
Make to order for special requests is available.

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

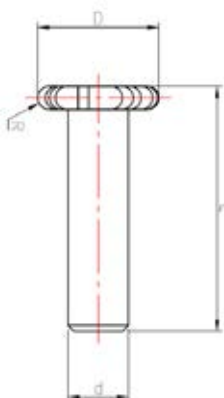
| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm



## Keyseat Cutter - Full Radius

### ■ T型R刀



| MODE       | Diameter | Corner Radius | Length after Shrink | Shank Diameter | Full Length | Flutes |
|------------|----------|---------------|---------------------|----------------|-------------|--------|
| 型號         | D 刀徑     | R值            | 燒結後伸出長              | d 柄徑           | L 全長        | Z 刃數   |
| TMRS080050 | 8        | 0.5           | 13                  | 4              | 30          | 6      |
| TMRS080075 |          | 0.75          | 13                  |                | 30          | 6      |
| TMRS080100 |          | 1             | 13                  |                | 30          | 6      |
| TMRS100050 | 10       | 0.5           | 13                  | 4              | 30          | 6      |
| TMRS100075 |          | 0.75          | 13                  |                | 30          | 6      |
| TMRS100100 |          | 1             | 13                  |                | 30          | 6      |
| TMRS120050 | 12       | 0.5           | 13                  | 6              | 30          | 6      |
| TMRS120075 |          | 0.75          | 13                  |                | 30          | 6      |
| TMRS120100 |          | 1             | 13                  |                | 30          | 6      |
| TMRS160050 | 16       | 0.5           | 12                  | 8              | 30          | 8      |
| TMRS160075 |          | 0.75          | 12                  |                | 30          | 8      |
| TMRS160100 |          | 1             | 12                  |                | 30          | 8      |
| TMRS160125 |          | 1.25          | 12                  |                | 30          | 8      |
| TMRS160150 |          | 1.5           | 12                  |                | 30          | 8      |
| TMRS200050 | 20       | 0.5           | 14                  | 10             | 35          | 8      |
| TMRS200075 |          | 0.75          | 14                  |                | 35          | 8      |
| TMRS200100 |          | 1             | 14                  |                | 35          | 8      |
| TMRS200125 |          | 1.25          | 14                  |                | 35          | 8      |
| TMRS200150 |          | 1.5           | 14                  |                | 35          | 8      |
| TMRS200250 |          | 2.5           | 19                  |                | 40          | 8      |
| TMRS200300 |          | 3             | 19                  |                | 40          | 8      |
| TMRS200350 |          | 3.5           | 24                  |                | 45          | 8      |
| TMRS200400 | 4        | 24            | 45                  | 8              |             |        |
| TMRS250050 | 25       | 0.5           | 14                  | 12             | 35          | 10     |
| TMRS250100 |          | 1             | 14                  |                | 35          | 10     |
| TMRS250125 |          | 1.25          | 14                  |                | 35          | 10     |
| TMRS250150 |          | 1.5           | 14                  |                | 35          | 10     |
| TMRS250250 |          | 2.5           | 19                  |                | 40          | 10     |
| TMRS250300 |          | 3             | 19                  |                | 40          | 10     |
| TMRS250350 |          | 3.5           | 24                  |                | 45          | 10     |
| TMRS250400 |          | 4             | 24                  |                | 45          | 10     |
| TMRS300050 | 30       | 0.5           | 10                  | 16             | 35          | 10     |
| TMRS300100 |          | 1             | 10                  |                | 35          | 10     |
| TMRS300150 |          | 1.5           | 10                  |                | 35          | 10     |
| TMRS300200 |          | 2             | 10                  |                | 35          | 10     |
| TMRS300250 |          | 2.5           | 15                  |                | 40          | 10     |
| TMRS300300 |          | 3             | 15                  |                | 40          | 10     |
| TMRS300350 |          | 3.5           | 20                  |                | 45          | 10     |
| TMRS300400 |          | 4             | 20                  |                | 45          | 10     |

特殊規格可依需求接單生產  
Make to order for special requests is available.

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                  | -50HRC             | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm



## 220° Ball Nose Cutter

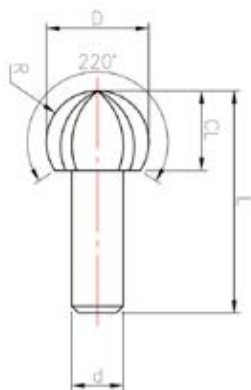
### ■ 220° 球刀



| MODE       | Corner Radius | Diameter | Cutting Length | Effective Rake Angle | Shank Diameter | Full Length | Flutes |
|------------|---------------|----------|----------------|----------------------|----------------|-------------|--------|
| 型號         | R值            | D 刃徑     | CL 刃長          | 有效切削角                | d 柄徑           | L 全長        | Z 刃數   |
| TRSS12006T | 6             | 12       | 9.3            | 220°                 | 6              | 26          | 6      |
| TRSS16006T | 8             | 16       | 13.3           |                      | 6              | 32          | 6      |
| TRSS20006T | 10            | 20       | 16             |                      | 10             | 35          | 6      |
| TRSS25006T | 12.5          | 25       | 20             |                      | 12             | 40          | 6      |

特殊規格可依需求接單生產

Make to order for special requests is available.



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC             | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ◎  | ◎                       | ○                  |        |        |        | ○                      | ○                      | ○                     |

Unit/單位: mm

RD072  
-D203  
-S20  
-150

# RD

## High Precision Indexable Radius End Mills

高效可轉位式圓鼻刀片

## Multi-Purpose by ONE Insert, Stable Machining of High Hardness Steel, Stainless Steel, and General Purpose.

多功能可轉位式刀片-實現了單一刀具可穩定加工於高硬度、不鏽鋼、和一般鋼材的通用性。

- Class E, H high accuracy E、H 研磨級高精度
- New ultra-toughened carbide UF1025 新超強韌鎢鋼母材
- Nano composite, super high hardness SH coating 奈米級 SH 超硬塗層
- Easy cut strengthened-shape design 強化快削設計
- RDH Insert for Aluminum RDH 鋁用刀片
- TB (DLC) coating for non-ferrous material 非鐵材質專用 TB 類鑽塗層



video 切削影片

**Indexable Radius End Mills for Efficient Machining**

**■ 高效可轉位式圓鼻銑刀片**

**■ Features 特色**

**Easy Cut Strengthened-Shape Design  
強化快削設計**

Improve feed rate, and processing efficiency  
提高進給率與加工效能

Standard shape  
標準型



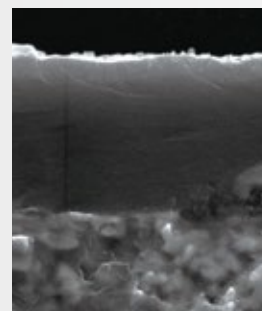
Easy cut strengthened shape  
強化快削型



**New ultra toughened micro-grain solid carbide UF1002 Super high hardness nano composite SH coating**

新型超強韌的微晶硬質合金 UF1025，奈米級超高硬度 SH 塗層

- Achieve stable machining of high hardness steel, stainless steel, and general purpose by ONE tool.
- Super high hardness and superior adhesion; also be good at high feed machining of hard materials application.
- 實現了單一刀具可穩定加工於高硬度、不銹鋼、和一般鋼材的通用性。
- 超高塗層硬度、超強附著力，適用於高硬度材質與高進給加工。



Super high hardness nano composite SH coating

New ultra toughened micro-grain solid carbide UF1025

**TB coating shows outstanding performance in machining non-ferrous material. Surpass 6 ~ 8 times efficacy in uncoated tool**

TB 塗層展現了優異的表現於非鐵材質加工，超越未塗層刀具 6~8 倍的效能。

TB coating is super high hardness and accuracy coating. The material removal rate (MRR) and the productivity in non-ferrous material process are greatly improved, due to the super low friction coefficient and the low metal content.

超高硬度與精度的 TB 塗層；同時具備了超低摩擦係數，及抗沾黏低金屬親和性，大幅地提升了非鐵材質加工的移除效率與生產效率。



|                         |       | TB Ta:C     | PVD a:CH     | PVD Me:CH    | CVD         | PaCVD        |
|-------------------------|-------|-------------|--------------|--------------|-------------|--------------|
| Deposition temp         | 沈積溫度  | under 150°C | under 200° C | under 200° C | over 900° C | under 200° C |
| Range of substrates     | 基材限制  | Broad       | Broad        | Broad        | Limited     | Broad        |
| Oxidation temp          | 氧化溫度  | 500°C       | 350° C       | 300° C       | 700° C      | 300° C       |
| Adhesion                | 附著力   | Very good   | Good         | Very Good    | Excellent   | Good         |
| Smoothness              | 平滑度   | Good        | Very good    | Good         | Good        | Excellent    |
| Hardness (GPA)          | 硬度    | 60-95       | 25           | 10-15        | 40-90       | 20-40        |
| Coefficient of friction | 摩擦係數  | <0.1        | <0.1         | 0.15         | <0.4        | <0.1         |
| Hydrogenated            | 氫化    | No          | Yes or No    | Yes          | No          | Yes          |
| Metal content           | 金屬親和性 | No          | Yes          | Yes          | No          | No           |

All DLC coatings are not equal : especially on Hardness and Oxidation  
各種類鑽膜都有不同的特性，尤其是硬度和氧化溫度

## Cutting Performance

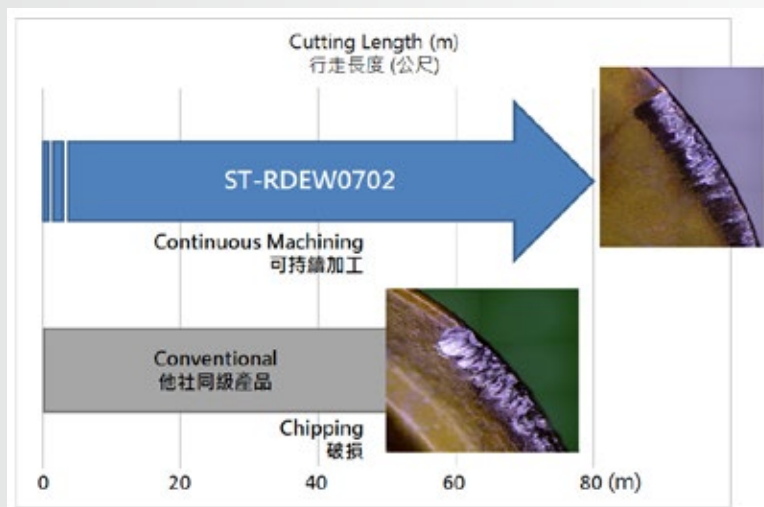
## ■ 切削效能

## ■ Carbon Steel - Heavy Duty Milling 碳素鋼 - 重切削

Excellent wear resistance when machining heavy duty carbon steel, and also can prolong tool life by 60%!  
優異的抗磨損效能於碳素鋼重切削，刀具壽命提升達 60%

## Cutting Conditions 切削條件

|                                  |                              |
|----------------------------------|------------------------------|
| Work material 工件：<br>S45C        | $f_z$ 每刃進給：<br>0.3mm/rev     |
| Holder 刀架：<br>RD072 D203 S20-150 | Feed 進給速度：<br>2500mm/min     |
| Insert 刀片：<br>RDEW0702           | $A_p$ : 1 mm<br>$A_e$ : 4 mm |
| $V_c$ 切削速度：<br>176m/min          | Speed 轉速：<br>2800rpm         |



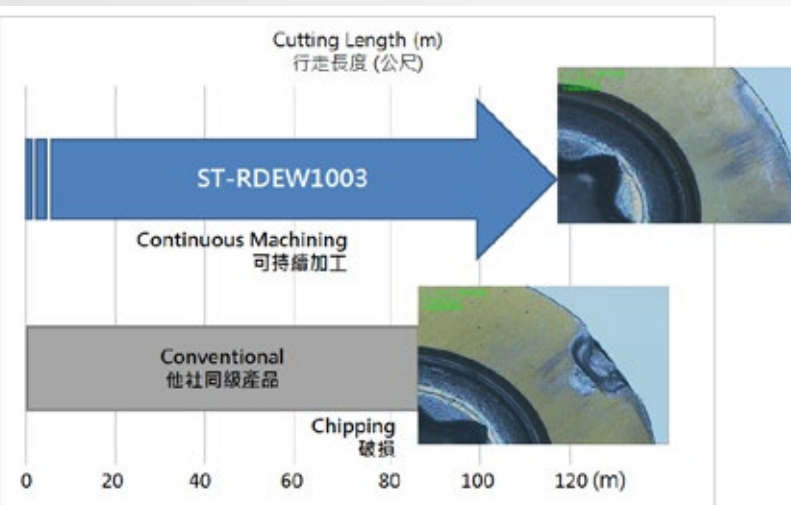
## ■ Stainless Steel - Heavy Duty Milling 不鏽鋼 - 重切削

Excellent wear resistance when heavy duty Stainless steel machining, achieved 35% tool life beyond the competitor.

優異的抗磨損效能於不鏽鋼重切削，刀具壽命提升達 35%

## Cutting Conditions 切削條件

|                                  |                              |
|----------------------------------|------------------------------|
| Work material 工件：<br>SUS316      | $f_z$ 每刃進給：<br>0.17mm/rev    |
| Holder 刀架：<br>RD103 D202 S20-150 | Feed 進給速度：<br>1050mm/min     |
| Insert 刀片：<br>RDEW1003           | $A_p$ : 1 mm<br>$A_e$ : 4 mm |
| $V_c$ 切削速度：<br>129 m/min         | Speed 轉速：<br>2050rpm         |





Cutting Performance

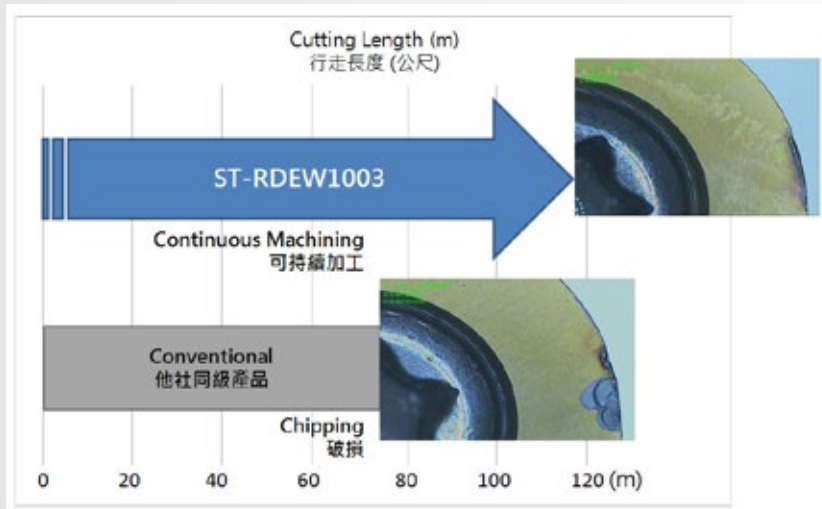
■ 切削效能

■ High Hardness Steel - Heavy Duty Milling 高硬度鋼 - 重切削

Excellent wear resistance when heavy duty High Hardness steel machining , achieved 53% tool life beyond the competitor.

優異的抗磨損效能於預硬鋼重切削，刀具壽命提升達 53%

| Cutting Conditions 切削條件                            |                          |
|--|--------------------------|
| Work material 工件：<br>Pre-Hardened SKD61<br>(HRC55) | fz 每刃進給：<br>0.1mm/rev    |
| Holder 刀架：<br>RD103 D202-S20-150                   | Feed 進給速度：<br>450mm/min  |
| Insert 刀片：<br>RDEW1003                             | Ap : 0.2 mm<br>Ae : 3 mm |
| Vc 切削速度：<br>94.3m/min                              | Speed 轉速：<br>1500        |



■ Aluminum Application - Heavy Duty Milling 鋁材 - 重切削

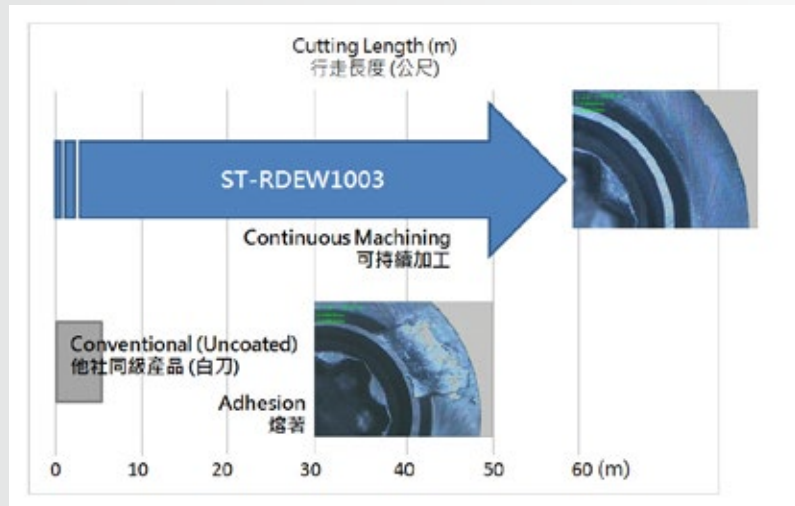
● Tools with TB coating are good at non-ferrous material process. Under dry-heavy duty machining, the tool life is prolonged to 1000%.

TB 類鑽塗層 (DLC) 於非鐵金屬加工中展現了優異的切削效能，在乾式重切削模式下，刀具壽命可提升達 **1000%**。

● Dry machining is available; it not only reduces the cost of coolant oil, but also makes the economical environmentally manufacturing come true.

可乾式切削，降低切削液使用成本，同時實現綠色加工可行性。

| Cutting Conditions 切削條件          |                             |
|----------------------------------|-----------------------------|
| Work material 工件：<br>AL6061      | fz 每刃進給：<br>0.25mm/rev      |
| Holder 刀架：<br>RD072 D203 S20-150 | Feed 進給速度：<br>3000mm/min    |
| Insert 刀片：<br>RDHX0702           | Ap : 1.0 mm<br>Ae : 12.0 mm |
| Vc 切削速度：<br>220m/min             | Speed 轉速：<br>3342           |

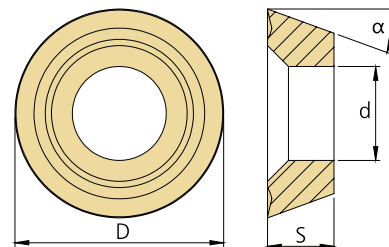




切削條件表 **P463**  
Cutting Condition

## Indexable Radius End Mill

### 可轉位式圓鼻銑刀

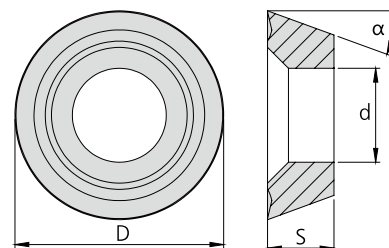
#### INSERTS 刀片





| Shape 外觀  | Order No. 品號 | Item code 規格碼   | Dimensions(mm) 規格 |      |      |          | Coating 塗層 | Available Tools 適用刀架 |                          | P | M | K |
|---|--------------|-----------------|-------------------|------|------|----------|------------|----------------------|--------------------------|---|---|---|
|   |              |                 | D                 | S    | d    | $\alpha$ |            | Shank Type 直柄式 Page  | Shrink Fit Type 燒結式 Page |   |   |   |
|    | JFRD2001-2   | RDEW0501M0-3225 | 5                 | 1.59 | 2.1  | 15°      | SH         | 290,291              | 289                      | ● | ▲ | ● |
|   | JFRD2002-2   | RDEW0702M0-3225 | 7                 | 2.38 | 2.75 | 15°      | SH         |                      |                          |   |   |   |
|   | JFRD2003-2   | RDEW1003M0-3225 | 10                | 3.18 | 4.5  | 15°      | SH         |                      |                          |   |   |   |
|  | JFRD2004-2   | RDEX0802M0-3225 | 8                 | 2.38 | 3.4  | 15°      | SH         | 290,291              | 289                      | ● | ● | ● |
|   | JFRD2005-2   | RDEX10T3M0-3225 | 10                | 3.97 | 4.5  | 15°      | SH         |                      |                          |   |   |   |
|   | JFRD2006-2   | RDEX1204M0-3225 | 12                | 4.76 | 4.5  | 15°      | SH         |                      |                          |   |   |   |
|   | JFRD2007-2   | RDEX1604M0-3225 | 16                | 4.76 | 5.5  | 15°      | SH         |                      |                          |   |   |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

#### INSERTS for Aluminum 鋁用刀片

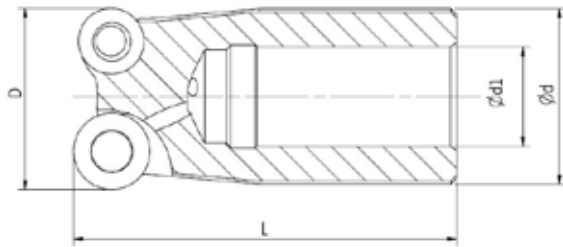


| Shape 外觀  | Order No. 品號 | Item code 規格碼   | Dimensions(mm) 規格 |      |      |          | Coating 塗層 | Available Tools 適用刀架 |                          | N |
|---|--------------|-----------------|-------------------|------|------|----------|------------|----------------------|--------------------------|---|
|   |              |                 | D                 | S    | d    | $\alpha$ |            | Shank Type 直柄式 Page  | Shrink Fit Type 燒結式 Page |   |
|  | JFRD2002-b   | RDHX0702EF-0225 | 7                 | 2.33 | 2.75 | 15°      | No         | 290,291              | 289                      | ● |
|   | JFRD2003-b   | RDHX1003EF-0225 | 10                | 3.12 | 4.5  | 15°      | No         |                      |                          |   |
|   | JFRD2004-b   | RDHX0802EF-0225 | 8                 | 2.32 | 3.4  | 15°      | No         |                      |                          |   |
|   | JFRD2005-b   | RDHX10T3EF-0225 | 10                | 3.92 | 4.5  | 15°      | No         |                      |                          |   |
|   | JFRD2006-b   | RDHX1204EF-0225 | 12                | 4.72 | 4.5  | 15°      | No         |                      |                          |   |
|   | JFRD2007-b   | RDHX1604EF-0225 | 16                | 4.72 | 5.5  | 15°      | No         |                      |                          |   |
|  | JFRD2002-b1  | RDHX0702EF-7225 | 7                 | 2.33 | 2.75 | 15°      | TB         | 290,291              | 289                      | ● |
|   | JFRD2003-b1  | RDHX1003EF-7225 | 10                | 3.12 | 4.5  | 15°      | TB         |                      |                          |   |
|   | JFRD2004-b1  | RDHX0802EF-7225 | 8                 | 2.32 | 3.4  | 15°      | TB         |                      |                          |   |
|   | JFRD2005-b1  | RDHX10T3EF-7225 | 10                | 3.92 | 4.5  | 15°      | TB         |                      |                          |   |
|   | JFRD2006-b1  | RDHX1204EF-7225 | 12                | 4.72 | 4.5  | 15°      | TB         |                      |                          |   |
|   | JFRD2007-b1  | RDHX1604EF-7225 | 16                | 4.72 | 5.5  | 15°      | TB         |                      |                          |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

RD Shrink Fit Head

■ RD 捨棄式燒結刀頭



| MODE        | Dimensions (mm) |    |    |    | Teeth | Available Insert | Screw   | Wrench |
|-------------|-----------------|----|----|----|-------|------------------|---------|--------|
| 型號          | D               | d  | L  | d1 | 刃數    | 適用刀片             | 螺絲      | 板手     |
| SRD05-D1602 | 16              | 16 | 35 | 10 | 2     | RD..0501         | MS2004A | T06    |
| SRD05-D1603 | 16              | 16 | 35 | 10 | 3     | RD..0501         | MS2004A | T06    |
| SRD05-D1702 | 17              | 16 | 35 | 10 | 2     | RD..0501         | MS2004A | T06    |
| SRD05-D1703 | 17              | 16 | 35 | 10 | 3     | RD..0501         | MS2004A | T06    |
| SRD07-D1602 | 16              | 16 | 35 | 10 | 2     | RD..0702         | MS2506A | T09    |
| SRD07-D1603 | 16              | 16 | 35 | 10 | 3     | RD..0702         | MS2506A | T09    |
| SRD07-D1702 | 17              | 16 | 35 | 10 | 2     | RD..0702         | MS2506A | T09    |
| SRD07-D1703 | 17              | 16 | 35 | 10 | 3     | RD..0702         | MS2506A | T09    |
| SRD07-D2003 | 20              | 20 | 40 | 10 | 3     | RD..0702         | MS2506A | T09    |
| SRD07-D2004 | 20              | 20 | 40 | 10 | 4     | RD..0702         | MS2506A | T09    |
| SRD07-D2103 | 21              | 20 | 40 | 10 | 3     | RD..0702         | MS2506A | T09    |
| SRD07-D2104 | 21              | 20 | 40 | 10 | 4     | RD..0702         | MS2506A | T09    |

產品出貨附件為螺絲 & 板手 Product with Screw and Wrench

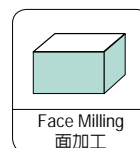
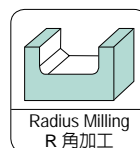
獲台灣專利 字號：新型第 M 512454 號  
Patent of Taiwan No.: M 512454

獲中國專利 字號：201520721653.9  
Patent of China No.: 201520721653.9



## Radius End Mill Holder

### ■ RD 捨棄式整體刀柄



| Item code<br>品名    | Dimensions(mm)<br>規格 |    |     |    | Teeth<br>刃數 | Available<br>Insert<br>適用刀片 | Page<br>頁碼 |
|--------------------|----------------------|----|-----|----|-------------|-----------------------------|------------|
|                    | D                    | d  | L   | L1 |             |                             |            |
| RD051-D122-S12-100 | 12                   | 12 | 100 | 22 | 2           | RDEW0501                    |            |
| RD051-D132-S12-100 | 13                   | 12 | 100 | 18 | 2           |                             |            |
| RD051-D164-S16-150 | 16                   | 16 | 150 | 30 | 4           |                             |            |
| RD051-D164-S16-200 |                      |    | 200 |    |             |                             |            |
| RD051-D174-S16-150 | 17                   | 16 | 150 | 20 | 4           |                             |            |
| RD051-D174-S16-200 |                      |    | 200 |    |             |                             |            |
| RD072-D162-S16-150 | 16                   | 16 | 150 | 35 | 2           |                             |            |
| RD072-D162-S16-200 |                      |    | 200 |    |             |                             |            |
| RD072-D172-S16-150 | 17                   | 16 | 150 | 20 | 2           |                             |            |
| RD072-D172-S16-200 |                      |    | 200 |    |             |                             |            |
| RD072-D203-S20-150 | 20                   | 20 | 150 | 35 | 3           |                             |            |
| RD072-D203-S20-200 |                      |    | 200 |    |             |                             |            |
| RD072-D213-S20-150 | 21                   | 20 | 150 | 25 | 3           |                             | 288        |
| RD072-D213-S20-200 |                      |    | 200 |    |             |                             |            |
| RD072-D254-S25-150 | 25                   | 25 | 150 | 40 | 4           | RDEW0702                    |            |
| RD072-D254-S25-200 |                      |    | 200 |    |             |                             |            |
| RD072-D254-S25-250 |                      |    | 250 |    |             |                             |            |
| RD072-D255-S25-150 | 25                   | 25 | 150 | 40 | 5           |                             |            |
| RD072-D255-S25-200 |                      |    | 200 |    |             |                             |            |
| RD072-D255-S25-250 |                      |    | 250 |    |             |                             |            |
| RD072-D264-S25-150 | 26                   | 25 | 150 | 25 | 4           |                             |            |
| RD072-D264-S25-200 |                      |    | 200 |    |             |                             |            |
| RD072-D264-S25-250 |                      |    | 250 |    |             |                             |            |
| RD072-D265-S25-150 | 26                   | 25 | 150 | 25 | 5           |                             |            |
| RD072-D265-S25-200 |                      |    | 200 |    |             |                             |            |
| RD072-D265-S25-250 |                      |    | 250 |    |             |                             |            |

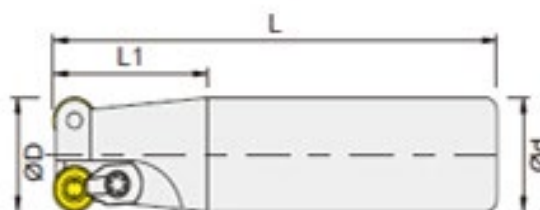
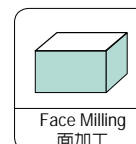
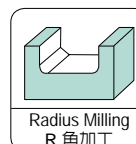
| Item code<br>品名    | Dimensions(mm)<br>規格 |    |     |    | Teeth<br>刃數 | Available<br>Insert<br>適用刀片 | Page<br>頁碼 |
|--------------------|----------------------|----|-----|----|-------------|-----------------------------|------------|
|                    | D                    | d  | L   | L1 |             |                             |            |
| RD072-D355-S32-150 | 35                   | 32 | 150 | 30 | 5           | RDEW0702                    |            |
| RD072-D355-S32-200 |                      |    | 200 |    |             |                             |            |
| RD072-D356-S32-150 | 35                   | 32 | 150 | 30 | 6           |                             |            |
| RD072-D356-S32-200 |                      |    | 200 |    |             |                             |            |
| RD103-D202-S20-150 | 20                   | 20 | 150 | 40 | 2           |                             |            |
| RD103-D202-S20-200 |                      |    | 200 |    |             |                             |            |
| RD103-D212-S20-150 | 21                   | 20 | 150 | 25 | 2           |                             |            |
| RD103-D212-S20-200 |                      |    | 200 |    |             |                             |            |
| RD103-D253-S25-150 | 25                   | 25 | 150 | 40 | 3           |                             |            |
| RD103-D253-S25-200 |                      |    | 200 |    |             |                             |            |
| RD103-D253-S25-250 |                      |    | 250 |    |             |                             |            |
| RD103-D263-S25-150 | 26                   | 25 | 150 | 25 | 3           |                             | 288        |
| RD103-D263-S25-200 |                      |    | 200 |    |             |                             |            |
| RD103-D263-S25-250 |                      |    | 250 |    |             |                             |            |
| RD103-D303-S25-150 | 30                   | 25 | 150 | 25 | 3           | RDEW1003                    |            |
| RD103-D303-S25-200 |                      |    | 200 |    |             |                             |            |
| RD103-D303-S25-250 |                      |    | 250 |    |             |                             |            |
| RD103-D323-S32-150 | 32                   | 32 | 150 | 40 | 3           |                             |            |
| RD103-D323-S32-200 |                      |    | 200 |    |             |                             |            |
| RD103-D323-S32-250 |                      |    | 250 |    |             |                             |            |
| RD103-D353-S32-150 | 35                   | 32 | 150 | 40 | 3           |                             |            |
| RD103-D353-S32-200 |                      |    | 200 |    |             |                             |            |
| RD103-D353-S32-250 |                      |    | 250 |    |             |                             |            |
| RD103-D354-S32-150 | 35                   | 32 | 150 | 40 | 4           |                             |            |
| RD103-D354-S32-200 |                      |    | 200 |    |             |                             |            |
| RD103-D354-S32-250 |                      |    | 250 |    |             |                             |            |

產品出貨附件為螺絲&板手 Product with Screw and Wrench

Radius End Mill Holder

■ RD 捨棄式整體刀柄

EASY-CUT SHANK TYPE 直柄快削式



| Item code<br>品名 | Dimensions(mm)<br>規格 |    |     |    | Teeth<br>刃數 | Available<br>Insert<br>適用刀片 | Page<br>頁碼 |
|-----------------|----------------------|----|-----|----|-------------|-----------------------------|------------|
|                 | D                    | d  | L   | L1 |             |                             |            |
| C12-4R12-130    | 12                   | 12 | 130 | 30 | 1           | RDEX0802                    | 288        |
| C16-4R16-150    | 16                   | 16 | 150 | 35 | 1           |                             |            |
| C16-4R16-200    |                      |    | 200 |    |             |                             |            |
| C16-4R172-150   | 17                   | 16 | 150 | 25 | 2           |                             |            |
| C20-4R20-150    |                      |    | 150 |    |             |                             |            |
| C20-4R20-200    | 20                   | 20 | 200 | 40 | 2           |                             |            |
| C20-4R21-150    |                      |    | 150 |    |             |                             |            |
| C20-4R21-200    | 21                   | 20 | 200 | 25 | 2           |                             |            |
| C25-5R25-150    |                      |    | 150 |    |             |                             |            |
| C25-5R25-200    | 25                   | 25 | 200 | 45 | 2           |                             |            |
| C25-5R25-250    |                      |    | 250 |    |             |                             |            |
| C25-5R26-150    | 26                   | 25 | 150 | 30 | 2           |                             |            |
| C25-5R26-200    |                      |    | 200 |    |             |                             |            |
| C25-5R26-250    |                      |    | 250 |    |             |                             |            |
| C25-5R302-150   | 30                   | 25 | 150 | 35 | 2           |                             |            |
| C25-5R302-200   |                      |    | 200 |    |             |                             |            |
| C25-5R302-250   |                      |    | 250 |    |             |                             |            |
| C25-5R303-150   | 30                   | 25 | 150 | 35 | 3           |                             |            |
| C25-5R303-200   |                      |    | 200 |    |             |                             |            |
| C25-5R303-250   |                      |    | 250 |    |             |                             |            |
| C32-5R32-150    | 32                   | 32 | 150 | 45 | 3           |                             |            |
| C32-5R32-200    |                      |    | 200 |    |             |                             |            |
| C32-5R32-250    |                      |    | 250 |    |             |                             |            |
| C32-5R32-300    |                      |    | 300 |    |             |                             |            |
| C32-5R35-150    | 35                   | 32 | 150 | 50 | 3           |                             |            |
| C32-5R35-200    |                      |    | 200 |    |             |                             |            |
| C32-5R35-250    |                      |    | 250 |    |             |                             |            |
| C32-5R35-300    |                      |    | 300 |    |             |                             |            |
| C32-5R40-150    | 40                   | 32 | 150 | 50 | 3           |                             |            |
| C32-5R40-200    |                      |    | 200 |    |             |                             |            |
| C32-5R40-250    |                      |    | 250 |    |             |                             |            |
| C32-5R40-300    |                      |    | 300 |    |             |                             |            |

產品出貨附件為螺絲&板手 Product with Screw and Wrench

Unit/單位: mm

# WRH

**Indexable Ball-Nose End Mill for Efficient Machining**  
高效捨棄式球刀片

**Multi-Purpose, Stable Machining of High Hardness Steel, Stainless Steel, and General Purpose by ONE Tool.**

實現了單一刀具可穩定加工於高硬度、不銹鋼、和一般鋼材的通用性。

- Class H high accuracy H 級高精度
- New ultra-toughened carbide UF1025 新超強韌鎢鋼母材
- Nano composite, super high hardness SH coating 奈米級 SH 超硬塗層
- S-Shaped design lower cutting resistance S 球頭低切削阻力設計
- Wide range, Screw-in holder is available 規格齊全，鎖牙式刀架可選購



video 切削影片

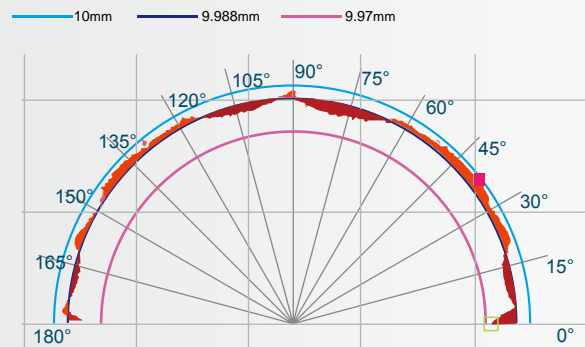
## Ball-nose Insert

### ■ 高效捨棄式球刀片

## ■ Features 特色

### High accuracy indexable Insert 高精度捨棄式銑刀片

Tolerance grade H. Accurate radius tolerance  
研磨公差 H 級



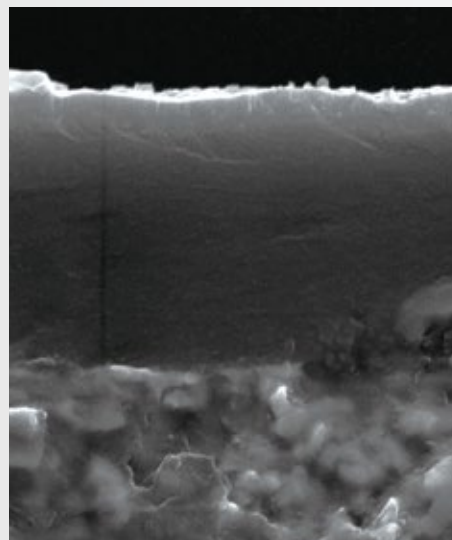
### S-Shaped design for lowering cutting resistance S 球頭低切削阻力設計

Improve chip removal performance, reduce edge wear,  
extend tool life and enhance the quality of processing.  
提高排屑效能，減小刃口磨損，大幅提高刀具壽命及加工品質



### New ultra toughened micro-grain solid carbide UF1002 Super high hardness nano composite SH coating 新型超強韌的微晶硬質合金 UF1025，奈米級超高硬度 SH 塗層

- Achieve stable machining of high hardness steel, stainless steel, and general purpose by ONE tool.
- Super high hardness and superior adhesion; also be good at high feed machining of hard materials application.
- 實現了單一刀具可穩定加工於高硬度、不銹鋼、和一般鋼材的通用性。
- 超高塗層硬度、超強附著力，適用於高硬度材質與高進給加工。



Super high  
hardness  
nano  
composite  
SH coating

New ultra  
toughened  
micro-grain  
solid carbide  
UF1025

## Ball-nose Insert

## ■ 高效捨棄式球刀片

## ■ Cutting Performance 切削效能

WRHS0162-Hardened steel milling  
預硬鋼切削 SKD61-HRC55°

Excellent wear resistance when machining high hardness materials, and the tool life is prolonged by 20% than the conventional.

於高硬度材料加工，展現優異的耐磨性，壽命超出一般刀具達到 20%。



Wear after milling 30m

Wear after milling 150m

Wear after milling 420m

Conventional 他社同級產品

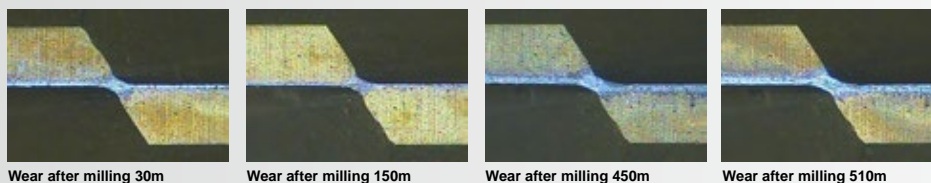
Chipping 破損

420m

 WRHS016

510m

Continuous Machining Feasible 可持續加工



Wear after milling 30m

Wear after milling 150m

Wear after milling 450m

Wear after milling 510m

## Cutting Conditions 切削條件

|   |                      |
|---|----------------------|
| Work Material 工件：Pre-Hardened SKD61 (HRC55) | fz 每刃進給：0.2 mm/rev   |
| Tool Holder 刀架：WGR16-S16-150                | Feed 進給速度：1200mm/min |
| Insert 刀片：WRHS016                           | Ap：0.15 mm           |
| Vc 切削速度：151mm/min                           | Ae：0.5 mm            |



切削條件表 **P464**  
Cutting Condition

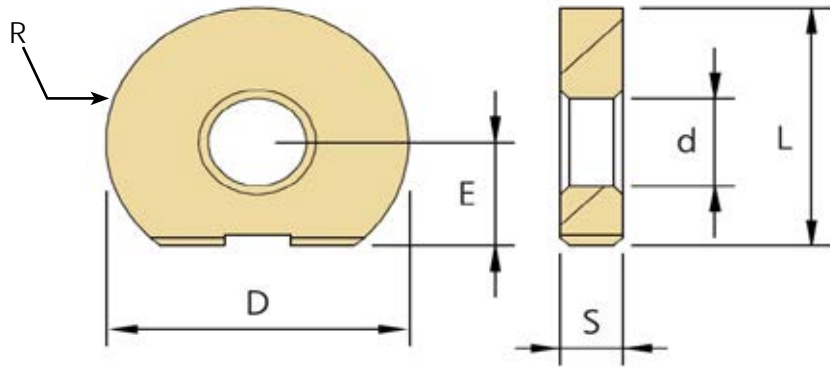
## Ball-nose Insert

### ■ 高效捨棄式球刀片

# WRH INSERTS 刀片

**H級**  
精度 ±0.013  
研磨級

**H CLASS**  
TOLERANCE: ±0.013



| Shape<br>外觀 | Order No.<br>品號 | Item code<br>規格碼 | Dimensions(mm)規格 |       |     |   |      |   | Holder<br>刀架 | Coating<br>塗層 | Shank<br>Type<br>直柄式<br>Page | Shrink Fit<br>Type<br>燒結式<br>Page | P | M | K |
|-------------|-----------------|------------------|------------------|-------|-----|---|------|---|--------------|---------------|------------------------------|-----------------------------------|---|---|---|
|             |                 |                  | D                | R     | S   | d | L    | E |              |               |                              |                                   |   |   |   |
|             | JFWR2002-1      | WRHS010-3225     | 10               | 5R    | 2.5 | 4 | 11.5 | 5 | WGR10        | SH            | 297                          | 296                               | ● | ▲ | ● |
|             | JFWR2003-1      | WRHS012-3225     | 12               | 6R    | 2.5 | 5 | 12   | 6 | WGR12        |               |                              |                                   |   |   |   |
|             | JFWR2004-1      | WRHS016-3225     | 16               | 8R    | 3   | 5 | 14   | 6 | WGR16        |               |                              |                                   |   |   |   |
|             | JFWR2005-1      | WRHS020-3225     | 20               | 10R   | 3   | 5 | 16   | 6 | WGR20        |               |                              |                                   |   |   |   |
|             | JFWR2006-1      | WRHS025-3225     | 25               | 12.5R | 4   | 6 | 21.5 | 9 | WGR25        |               |                              |                                   |   |   |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

Application 適用材質:

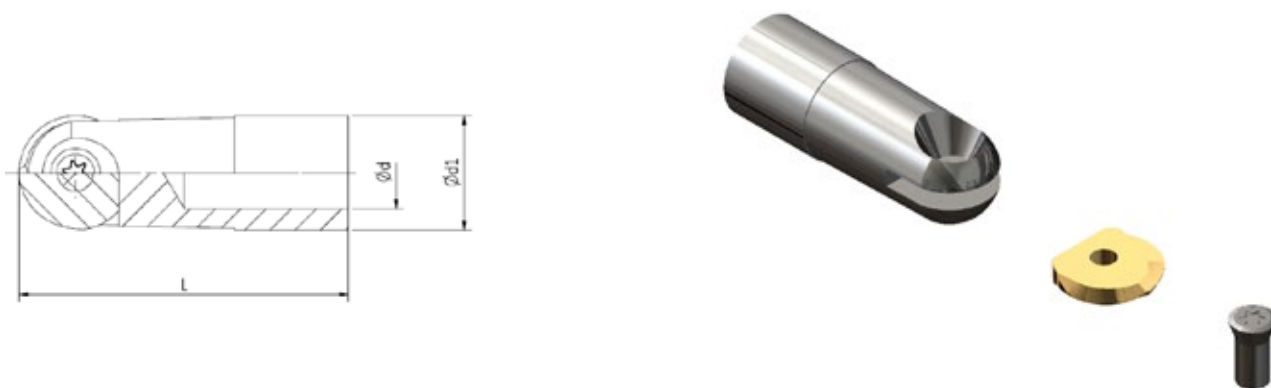
◎ Recommend 最適合 ○ Suitable 適合 X Not Recommend 不建議

| Carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened 高硬度鋼 |        |        |        | Stainless steel<br>不銹鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|--------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | -45HRC                    | -50HRC             | -55HRC | -60HRC | -65HRC |                        |                        |                       |
| ◎  | ◎                         | ◎                  | ◎      | ○      | ◎      |                        |                        |                       |

Unit/單位: mm

WR Shrink Fit Head

■ WR 捨棄式燒結刀頭



| MODE       | Dimensions (mm) |    |    |    | Teeth | Available Insert | Screw   | Wrench |
|------------|-----------------|----|----|----|-------|------------------|---------|--------|
| 型號         | D               | d1 | L  | d  | 刃數    | 適用刀片             | 螺絲      | 板手     |
| SWR10-HD06 | 10              | 10 | 35 | 6  | 1     | WR..010          | MGR4010 | T15    |
| SWR12-HD08 | 12              | 12 | 40 | 8  | 1     | WR..012          | MGR5012 | T20    |
| SWR16-HD14 | 16              | 16 | 55 | 10 | 1     | WR..016          | MGR5016 | T20    |
| SWR20-HD18 | 20              | 20 | 60 | 12 | 1     | WR..020          | MGR5020 | T20    |

產品出貨附件為螺絲 & 板手 Product with Screw and Wrench

獲台灣專利 字號：新型第 M 512454 號  
Patent of Taiwan No.: M 512454

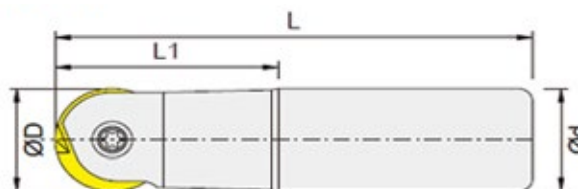
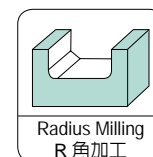
獲中國專利 字號：201520721653.9  
Patent of China No.: 201520721653.9



## Ball-nose Insert Holder

## ■ WR 捨棄式整體刀柄

## WGR SHANK TYPE 直柄式



| Item code<br>品名 | Dimensions(mm)<br>規格 |    |     |    | Teeth<br>刃數 | Insert<br>刀片 | Page<br>頁碼 |
|-----------------|----------------------|----|-----|----|-------------|--------------|------------|
|                 | D                    | d  | L   | L1 |             |              |            |
| WGR10-S10-100   | 10                   | 10 | 100 | 25 | 1           | WRH010       | 295        |
| WGR10-S12-150   |                      | 12 | 150 | 36 |             |              |            |
| WGR12-S12-150   | 12                   | 12 | 150 | 32 | 1           | WRH012       |            |
| WGR12-S16-200   |                      | 16 | 200 | 58 |             |              |            |
| WGR16-S16-150   | 16                   | 16 | 150 | 36 | 1           | WRH016       |            |
| WGR16-S16-200   |                      |    | 200 |    |             |              |            |
| WGR20-S20-150   | 20                   | 20 | 150 | 45 | 1           | WRH020       |            |
| WGR20-S20-200   |                      |    | 200 |    |             |              |            |
| WGR20-S25-200   |                      | 25 | 200 | 76 |             |              |            |
| WGR20-S25-250   |                      |    | 250 |    |             |              |            |
| WGR25-S25-200   | 25                   | 25 | 200 | 45 | 1           | WRH025       |            |
| WGR25-S25-250   |                      |    | 250 |    |             |              |            |
| WGR25-S32-200   |                      | 32 | 200 | 98 |             |              |            |
| WGR25-S32-300   |                      |    | 300 |    |             |              |            |

產品出貨附件為螺絲&板手 Product with Screw and Wrench



# HN

## Indexable HN End Mill for Efficient Machining 高效可轉位式 HN 雙面六角銑刀片

### Multi-Purpose, Stable Machining of Steel, Cast Iron, Stainless Steel, and General Purpose by ONE Tool.

實現了單一刀具可穩定加工於一般鋼材、鑄鐵、不銹鋼的通用性。

- The double-sided multi-edge design make it a cost-efficient solution – 12 times use.  
大幅降低刀具成本 - 雙面對稱共十二角可換位切削
- Special cutting edge geometries with a high cutting performance to cast iron.  
刃口特殊設計對於鑄鐵材料有良好的切削性
- Circular arc design of corner is to maximize cutting edge, and improve tool life effectively  
轉角圓弧設計提升刃口強度，有效提升刀具壽命。
- Nano composite; the oxidation temperature of nACro coating is up to 1,100°C  
奈米級 nACro 高耐氧化溫度塗層
- Nano composite, super high hardness SH coating 奈米級 SH 超硬塗層



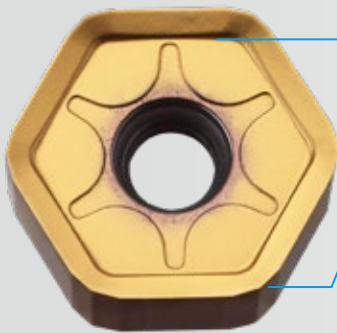
video 切削影片

## HN Indexable Insert

### ■ 雙面六角銑刀片

#### ■ Feature 特色

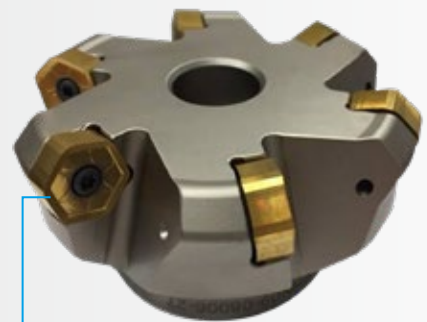
##### Design 外型設計



The double-sided multi-edge design make it a cost-efficient solution – 12 times use. It offers high productivity and a low cost per edge.  
雙面對稱共十二角可換位切削，減少刀具成本。

Special cutting edge geometries with a high cutting performance to cast iron.  
刃口特殊設計對於鑄鐵材料有良好的切削性。

Circular arc design of corner is to maximize cutting edge, and improve tool life effectively.  
轉角圓弧設計提升刃口強度，有效提升刀具壽命。



##### Coating 塗層介紹 – nACro and SH coating



The oxidation temperature of nACro coating is up to 1,100°C , which is suitable for milling cast iron, carbon steel, stainless steel, and alloy steel.

nACro 具有高達 1100°C 氧化溫度的特性，適用於切削鑄鐵、一般碳鋼、不鏽鋼以及合金鋼的鍍層。



SH coating is with low friction coefficient and super high hardness which is over HV4000; thus, with cutting tool, it can mill steel very easily.

SH 結構低摩擦係數，超高硬度，表面硬度達 Hv4000 以上，削鐵如泥。

#### Application - New ultra toughened micro-grain solid carbide 3225/4225 & 3220/4220 應用 – 型超強韌微晶硬質合金 3225/4225 及 3220/4220


| Tool Material<br>材料型號 | ISO Standard Code<br>ISO 標準代號 | Cutting Material<br>材料種類  | Applications<br>應用範圍 |   |    |    |    |    |    |    |    |    |    |  |  | P<br>Steel | M<br>Stainless<br>不銹鋼 | K<br>Cast Iron<br>灰鑄鐵 | N<br>Non-ferrous<br>非鐵金屬 | S<br>Heat resistant<br>耐熱合金 | H<br>Hard Alloy<br>硬質合金 |  |   |
|-----------------------|-------------------------------|---------------------------|----------------------|---|----|----|----|----|----|----|----|----|----|--|--|------------|-----------------------|-----------------------|--------------------------|-----------------------------|-------------------------|--|---|
|                       |                               |                           | 1                    | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |  |  |            |                       |                       |                          |                             |                         |  |   |
| 3225                  | P                             | Cemented Carbide<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |            | ●                     | ▲                     |                          |                             |                         |  | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ▲                     |                          |                             |                         |  |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       |                       | ●                        |                             |                         |  |   |
| 4225                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ●                     | ▲                        |                             |                         |  | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ▲                     |                          |                             |                         |  |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       |                       | ●                        |                             |                         |  |   |
| 3220                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ●                     | ▲                        |                             |                         |  | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ●                     |                          |                             |                         |  |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       |                       | ●                        |                             |                         |  |   |
| 4220                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ●                     | ▲                        |                             |                         |  | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       | ●                     |                          |                             |                         |  |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |            |                       |                       | ●                        |                             |                         |  |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

## Cutting Performance

### ■ 切削效能

### ■ Carbon Steel - S45C HNGX0604 切削 S45C 中碳鋼



| Cutting Length 加工行走長度 (m)   |  |    |  |    |
|---|--|----|--|----|
| 10  |  | 20 |  | 30 |
|   |  |    |  |    |
| <div style="border: 1px solid black; background-color: #ADD8E6; padding: 5px; display: inline-block; margin: 5px;"> <math>a_p=2.5mm \quad f_z=0.17mm.tooth</math> </div>  |  |    |  |    |
|   |  |    |  |    |
| <div style="border: 1px solid black; background-color: #90EE90; padding: 5px; display: inline-block; margin: 5px;"> <math>a_p=1.75mm \quad f_z=0.27mm.tooth</math> </div> |  |    |  |    |

| Cutting Conditions 條件與設備規格 |                                |
|----------------------------|--------------------------------|
| Material 工件材料              | S45C                           |
| Cutting Fluid 切削液          | Air 噴氣                         |
| Spindle Horsepower 主軸馬力    | 7.5/11kW                       |
| Chucks 刀桿規格                | BT40                           |
| Tool 刀具規格                  | PHN06-5006(Ø50mm x 145mm x 6T) |
| Insert 刀片規格                | HNGX0604-R-3225                |
| Vc 切線速度                    | 250(m/min)                     |
| Ae 徑向切削步距                  | 33mm                           |

Formula 公式  $Vc = \pi DN/1000$   $F = fz \cdot T \cdot N$

Surface Performance

■ 表面粗糙度

■ HN face milling HN 面銑

Surface Roughness Tester 表面粗度測量儀 : Mitutoyo Surftest\_SJ-301

| Carbon Steel 中碳鋼 - S45C   |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 - PHN06-5006(Ø50mm x 145mm x 6T)  |   |  |
| Insert 刀片 - HNGX0604-R-3225   |   |  |
| Vc=200m/min   |   |  |
| N=1270rpm   |   |  |
| Fz=0.1mm/tooth  | Fz=0.3mm/tooth  | Fz=0.5mm/tooth   |
| Ra=1.22 μ m   | Ra=1.66 μ m   | Ra=1.82 μ m  |

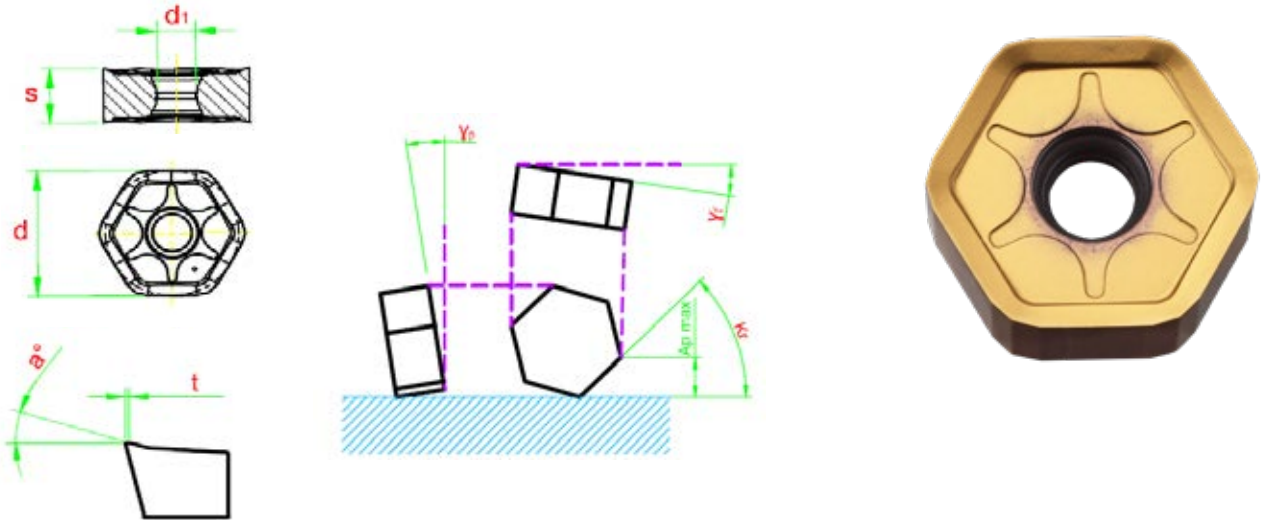
| Stainless Steel 不鏽鋼 - SUS304  |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 - PHN06-5006(Ø50mm x 145mm x 6T)  |   |  |
| Insert 刀片 - HNGX0604-R-3225   |   |  |
| Vc=120m/min   |   |  |
| N=764rpm  |   |  |
| Fz=0.1mm/tooth  | Fz=0.3mm/tooth  | Fz=0.5mm/tooth   |
| Ra=1.19 μ m   | Ra=1.51 μ m   | Ra=1.85 μ m  |

| Nodular Cast Iron/Ductile Iron 球墨鑄鐵   |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 - PHN06-5006(Ø50mm x 145mm x 6T)  |   |  |
| Insert 刀片 - HNGX0604-R-3225   |   |  |
| Vc=200m/min   |   |  |
| N=1270rpm   |   |  |
| Fz=0.1mm/tooth  | Fz=0.3mm/tooth  | Fz=0.5mm/tooth   |
| Ra=1.38 μ m   | Ra=1.90 μ m   | Ra=2.85 μ m  |

切削條件表  
**P465**  
 Cutting Condition

## HN Indexable Insert

### ■ HN 雙面六角銑刀



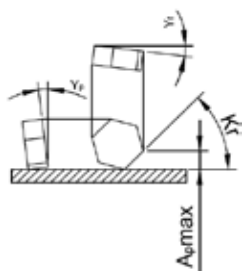
| Shape<br>外觀   | Item Code<br>規格碼 | Dimensions (mm) 規格 |      |      |      |      | Coating<br>塗層 |    | Radius<br>R 值 | Milling<br>銑削 | P | M | K |
|---|------------------|--------------------|------|------|------|------|---------------|----|---------------|---------------|---|---|---|
|   |                  | d                  | d1   | s    | a    | t    | nACro         | SH |               |               |   |   |   |
|  | HNGX0604-R-3225  | 10.5               | 3.64 | 5.26 | 15   | 0.08 |               | ✓  | R0.6          | Roughing 粗銑   | ● | ▲ | ● |
|   |                  |                    |      |      |      |      |               |    |               | Medium 中      | ● | ▲ | ● |
|   |                  |                    |      |      |      |      |               |    |               | Finishing 精銑  | ● | ▲ | ● |
|   |                  | HNGX0604-R-4225    | 10.5 | 3.64 | 5.26 | 15   | 0.08          | ✓  |               | Roughing 粗銑   | ● | ● | ▲ |
|   |                  |                    |      |      |      |      |               |    |               | Medium 中      | ● | ● | ▲ |
|   |                  |                    |      |      |      |      |               |    |               | Finishing 精銑  | ● | ● | ▲ |
|  | HNGX0906-R-3225  | 16.5               | 4.74 | 6.4  | 15   | 0.08 |               | ✓  | R0.8          | Roughing 粗銑   | ● | ▲ | ● |
|   |                  |                    |      |      |      |      |               |    |               | Medium 中      | ● | ▲ | ● |
|   |                  |                    |      |      |      |      |               |    |               | Finishing 精銑  | ● | ▲ | ● |
|   |                  | HNGX0906-R-4225    | 16.5 | 4.74 | 6.4  | 15   | 0.08          | ✓  |               | Roughing 粗銑   | ● | ● | ▲ |
|   |                  |                    |      |      |      |      |               |    |               | Medium 中      | ● | ● | ▲ |
|   |                  |                    |      |      |      |      |               |    |               | Finishing 精銑  | ● | ● | ▲ |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

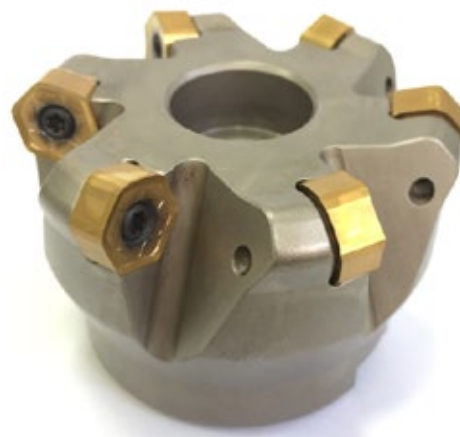
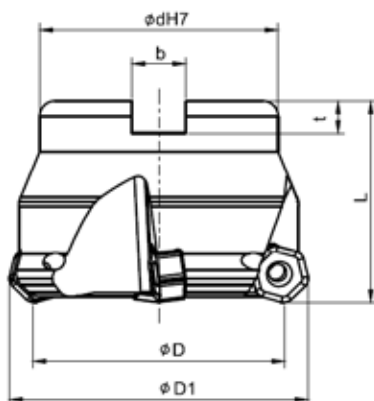


## HN06 Holder

### ■ HN06 捨棄式整體刀柄

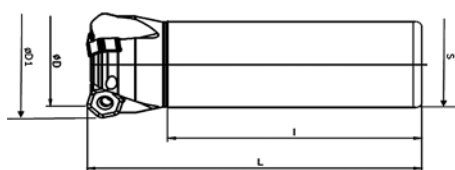
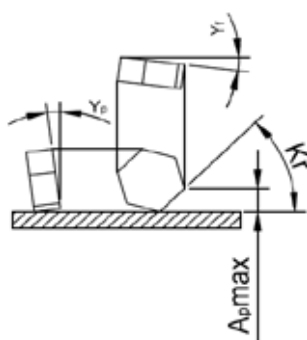


|            |     |
|------------|-----|
| $A_{pmax}$ | 3mm |
| $y_p$      | 7°  |
| $y_f$      | 7°  |
| $K_r$      | 45° |



### Shell Type Milling Cutter 殼型面銑刀

| Item Code<br>規格碼 | Dimensions (mm) 規格 |     |    |      |      |     |      | Available Tools<br>適用工具 |                                  |                     |
|------------------|--------------------|-----|----|------|------|-----|------|-------------------------|----------------------------------|---------------------|
|                  | D                  | dh7 | L  | D1   | b    | t   | 齒數T* | Insert<br>刀片            | Screw<br>星形螺絲                    | Screwdriver<br>旗形板手 |
| PHN06-4005-C16   | 40                 | 16  | 40 | 47.3 | 8.4  | 5.6 | 5    | HNGX0604-R              | M3x7.9x4.4xT10<br>(D07160100119) | T10                 |
| PHN06-5004-C22   | 50                 | 22  | 40 | 57.3 | 10.4 | 6.3 | 4    |                         |                                  |                     |
| PHN06-5006-C22   | 50                 | 22  | 40 | 57.3 | 10.4 | 6.3 | 6    |                         |                                  |                     |
| PHN06-6306-C22   | 63                 | 22  | 40 | 70.3 | 10.4 | 6.3 | 6    |                         |                                  |                     |
| PHN06-6308-C22   | 63                 | 22  | 40 | 70.3 | 10.4 | 6.3 | 8    |                         |                                  |                     |
| PHN06-8007-C27   | 80                 | 27  | 50 | 86.8 | 12.4 | 7.0 | 7    |                         |                                  |                     |
| PHN06-8010-C27   | 80                 | 27  | 50 | 86.8 | 12.4 | 7.0 | 10   |                         |                                  |                     |



|            |     |
|------------|-----|
| $A_{pmax}$ | 3mm |
| $y_p$      | 7°  |
| $y_f$      | 7°  |
| $K_r$      | 45° |

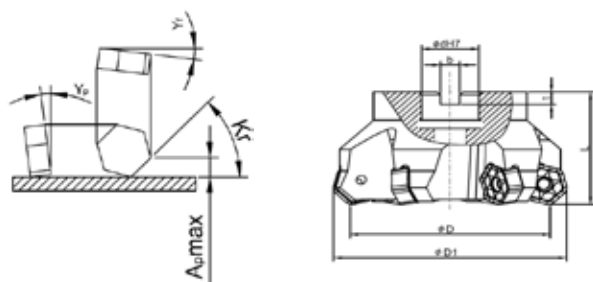


### Holder 刀桿式六角銑刀

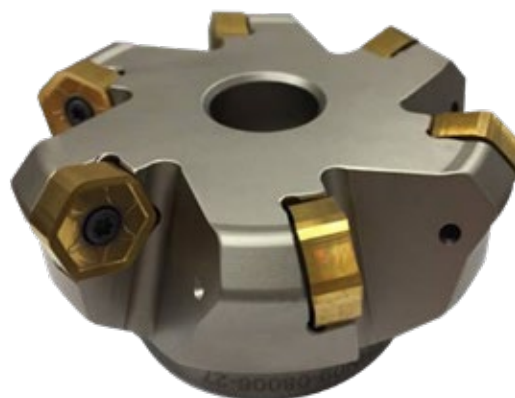
| Item Code<br>規格碼   | Dimensions (mm) 規格 |      |     |     |    |      | Available Tools<br>適用工具 |                                  |                     |
|--------------------|--------------------|------|-----|-----|----|------|-------------------------|----------------------------------|---------------------|
|                    | D                  | D1   | L   | l   | S  | 齒數T* | Insert<br>刀片            | Screw<br>星形螺絲                    | Screwdriver<br>旗形板手 |
| HHN06-2502-S25-150 | 25                 | 32.2 | 150 | 100 | 25 | 2    | HNGX0604-R              | M3x7.9x4.4xT10<br>(D07160100119) | T10                 |
| HHN06-2503-S25-150 | 25                 | 32.2 | 150 | 100 | 25 | 3    |                         |                                  |                     |
| HHN06-3203-S32-150 | 32                 | 39.3 | 150 | 100 | 32 | 3    |                         |                                  |                     |
| HHN06-3204-S32-150 | 32                 | 39.3 | 150 | 100 | 32 | 4    |                         |                                  |                     |

## HN09 Holder

### ■ HN09 捨棄式整體刀柄



|            |     |
|------------|-----|
| $A_{pmax}$ | 5mm |
| $\gamma_p$ | 7°  |
| $\gamma_f$ | 7°  |
| $\gamma_r$ | 45° |



#### Shell Type Milling Cutter 殼型面銑刀

| Item Code<br>規格碼  | Dimensions (mm) 規格 |     |       |    |      |     |          | Available Tools<br>適用工具 |                                    |                     |
|-------------------|--------------------|-----|-------|----|------|-----|----------|-------------------------|------------------------------------|---------------------|
|                   | dh7                | D   | D1    | L  | b    | t   | 齒數 $T^*$ | Insert<br>刀片            | Screw<br>星形螺絲                      | Screwdriver<br>旗形板手 |
| PHN09-5004-C22    | 22                 | 50  | 61.7  | 40 | 10.4 | 6.3 | 4        | HNGX 0906-R             | M4.x11.2x5.7xT15<br>(D07160100120) | T15                 |
| PHN09-6306-C22    | 22                 | 63  | 74.7  | 40 | 10.4 | 6.3 | 6        |                         |                                    |                     |
| PHN09-8006-C27    | 27                 | 80  | 91.7  | 50 | 12.4 | 7.0 | 6        |                         |                                    |                     |
| PHN09-8008-C27    | 27                 | 80  | 91.7  | 50 | 12.4 | 7.0 | 8        |                         |                                    |                     |
| PHN09-10008-C32   | 32                 | 100 | 111.7 | 50 | 14.4 | 8.0 | 8        |                         |                                    |                     |
| PHN09-10010-C32   | 32                 | 100 | 111.7 | 50 | 14.4 | 8.0 | 10       |                         |                                    |                     |
| PHN09-12510-C40   | 40                 | 125 | 136.7 | 63 | 16.4 | 9.0 | 10       |                         |                                    |                     |
| PHN09-12510-C40-L | 40                 | 125 | 136.7 | 63 | 16.4 | 9.0 | 10       |                         |                                    |                     |



# CN

## Indexable CN End Mill for Efficient Machining 高效可轉位式 CN 雙面銑刀片

### Multi-Purpose, Stable Machining of Steel, Cast Iron, Stainless Steel, and General Purpose by ONE Tool.

實現了單一刀具可穩定加工於一般鋼材、鑄鐵、不鏽鋼的通用性。

- High accuracy insert which is suitable for middle finishing and finishing.  
高精度刀片適用於中、精銑
- 4 times use - The double-sided 2-edge design make it a cost-efficient solution.  
大幅降低刀具成本 - 雙面對稱共四角可替換
- Nano composite; the oxidation temperature of nACro coating is up to 1,100°C  
奈米級 nACro 高耐氧化溫度塗層
- Nano composite, super high hardness SH coating 奈米級 SH 超硬塗層



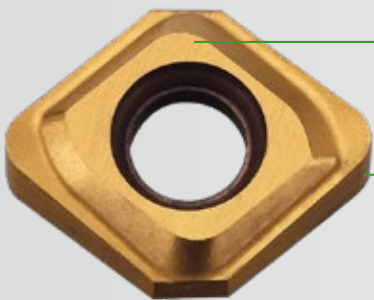
video 切削影片

CN Indexable Insert

■ CN 雙面銑刀片

■ Feature 特色

Design 外型設計

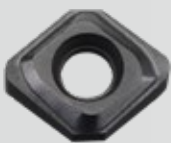


High accuracy insert which is suitable for middle finishing and finishing.  
高精度刀片適用於中、精銑。

4 times use - The double-sided 2-edge design make it a cost-efficient solution.  
雙面對稱四角可替換，減少刀具成本。



Coating 塗層介紹 - nACro and SH coating



The oxidation temperature of nACro coating is up to 1,100°C, which is suitable for milling cast iron, carbon steel, stainless steel, and alloy steel.  
nACro 具有高達 1100°C 氧化溫度的特性，適用於切削鑄鐵、一般碳鋼、不鏽鋼以及合金鋼的鍍層。



SH coating is with low friction coefficient and super high hardness which is over HV4000; thus, with cutting tool, it can mill steel very easily.  
SH 結構低摩擦係數，超高硬度，表面硬度達 Hv4000 以上，削鐵如泥。

Application - New ultra toughened micro-grain solid carbide 3225/4225 & 3220/4220  
應用 - 型超強韌微晶硬質合金 3225/4225 及 3220/4220

| Tool Material<br>材料型號 | ISO Standard Code<br>ISO 標準代號 | Cutting Material<br>材料種類  | Applications<br>應用範圍 |   |    |    |    |    |    |    |    |    |    |  |  | P<br>鋼<br>Steel | M<br>不鏽鋼<br>Stainless | K<br>鑄鐵<br>Cast Iron | N<br>非鐵金屬<br>Non-ferrous | S<br>耐熱合金<br>Heat resistant | H<br>硬質合金<br>Hard Alloy |  |   |   |
|-----------------------|-------------------------------|---------------------------|----------------------|---|----|----|----|----|----|----|----|----|----|--|--|-----------------|-----------------------|----------------------|--------------------------|-----------------------------|-------------------------|--|---|---|
|                       |                               |                           | 1                    | 5 | 10 | 15 | 20 | 25 | 30 | 35 | 40 | 45 | 50 |  |  |                 |                       |                      |                          |                             |                         |  |   |   |
| 3225                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 | ●                     | ▲                    | ●                        |                             |                         |  | ▲ |   |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      | ▲                        | ●                           |                         |  |   |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      |                          | ●                           |                         |  |   |   |
| 4225                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       | ●                    | ▲                        | ●                           |                         |  |   | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      | ▲                        | ●                           |                         |  |   |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      |                          | ●                           |                         |  |   |   |
| 3220                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       | ●                    | ▲                        | ●                           |                         |  |   | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      | ●                        |                             |                         |  |   |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      |                          | ▲                           | ●                       |  |   |   |
| 4220                  | P                             | Super Hard Alloy<br>超硬質合金 |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       | ●                    | ▲                        | ●                           |                         |  |   | ▲ |
|                       | M                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      | ●                        |                             |                         |  |   |   |
|                       | K                             |                           |                      |   |    |    |    |    |    |    |    |    |    |  |  |                 |                       |                      |                          | ▲                           | ●                       |  |   |   |


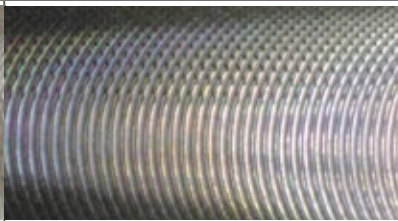
●: Main Application 主要應用 ▲: Secondary Application 次要應用

Surface Performance

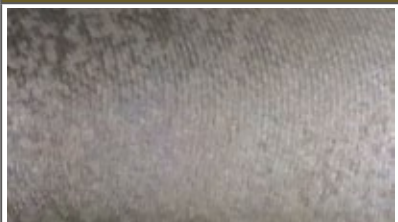


■ 表面粗糙度

■ CN face milling CN 平銑

Surface Roughness Tester 表面粗度測量儀 : MitutoyoSurftest\_SJ-301

| Carbon Steel 中碳鋼 -S45C  |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 : HCN07-D1602-S16-150   |   |  |
| Insert 刀片 : CNGX07-3225   |   |  |
| Vc=180m/min   |   |  |
| N=3580rpm   |   |  |
| Fz=0.05mm/tooth<br>Ra=0.45 μ m  | Fz=0.2mm/tooth<br>Ra=1.01 μ m   | Fz=0.3mm/tooth<br>Ra=2.06 μ m  |

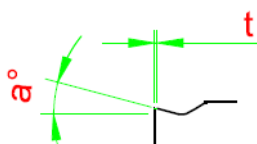
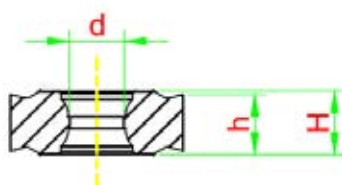
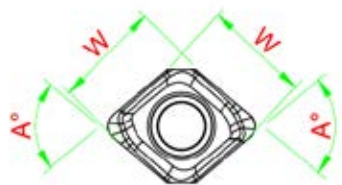
| Stainless Steel 不鏽鋼 - SUS304  |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 : HCN07-D1602-S16-150   |   |  |
| Insert 刀片 : CNGX07-3225   |   |  |
| Vc=100m/min   |   |  |
| N=1990rpm   |   |  |
| Fz=0.05mm/tooth<br>Ra=0.38 μ m  | Fz=0.2mm/tooth<br>Ra=0.52 μ m   | Fz=0.3mm/tooth<br>Ra=1.38 μ m  |

| Nodular Cast Iron/Ductile Iron 球墨鑄鐵   |   |  |
|---|---|--|
|  |  |  |
| Holder 刀具 : HCN07-D1602-S16-150   |   |  |
| Insert 刀片 : CNGX07-3225   |   |  |
| Vc=200m/min   |   |  |
| N=3980rpm   |   |  |
| Fz=0.05mm/tooth<br>Ra=0.81 μ m  | Fz=0.2mm/tooth<br>Ra=1.09 μ m   | Fz=0.3mm/tooth<br>Ra=1.30 μ m  |

切削  
條件表 **P466**  
Cutting Condition

## CN Indexable Insert

### ■ CN 雙面菱形銑刀

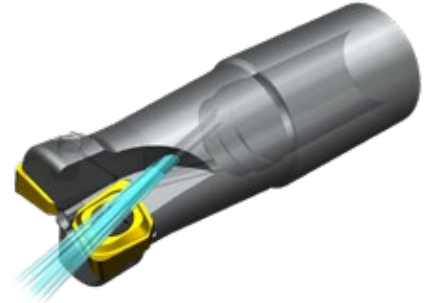
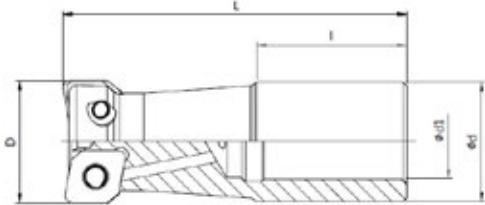


| Shape<br>外觀 | Item Code<br>規格碼 | Dimensions (mm) 規格 |      |      |     |    |               |               | Coating 塗層 |              | Radius<br>R 值 | Milling<br>銑削 | P | M | K |
|-------------|------------------|--------------------|------|------|-----|----|---------------|---------------|------------|--------------|---------------|---------------|---|---|---|
|             |                  | W                  | d    | h    | H   | A  | a             | t             | nACro      | SH           |               |               |   |   |   |
|             | CNGX07-3225      | 7                  | 3.1  | 3.41 | 3.6 | 80 | 15            | 0.02<br>-0.03 |            | ✓            | R1            | Roughing 粗銑   | ● | ▲ | ● |
|             |                  |                    |      |      |     |    |               |               |            |              |               | Medium 中      | ● | ▲ | ● |
|             |                  |                    |      |      |     |    |               |               |            |              |               | Finishing 精銑  | ● | ▲ | ● |
|             | CNGX07-4225      | 7                  | 3.1  | 3.41 | 3.6 | 80 | 15            | 0.02<br>-0.03 | ✓          |              |               | Roughing 粗銑   | ● | ▲ | ● |
|             |                  |                    |      |      |     |    |               |               |            |              |               | Medium 中      | ● | ● | ● |
|             |                  |                    |      |      |     |    |               |               |            |              |               | Finishing 精銑  | ● | ● | ● |
|             | CNGX07-3220      | 7                  | 3.1  | 3.41 | 3.6 | 80 | 15            | 0.02<br>-0.03 |            | ✓            |               | Roughing 粗銑   | ● | ▲ | ▲ |
|             |                  |                    |      |      |     |    |               |               |            |              |               | Medium 中      | ● | ▲ | ● |
| CNGX07-4220 | 7                | 3.1                | 3.41 | 3.6  | 80  | 15 | 0.02<br>-0.03 | ✓             |            | Roughing 粗銑  | ●             | ▲             | ● |   |   |
|             |                  |                    |      |      |     |    |               |               |            | Medium 中     | ●             | ●             | ▲ |   |   |
|             |                  |                    |      |      |     |    |               |               |            | Finishing 精銑 | ●             | ●             | ● |   |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

## CNGX07 Shrink Fit Head & Holder

### ■ CNGX07 捨棄式燒結刀頭 & 整體刀柄

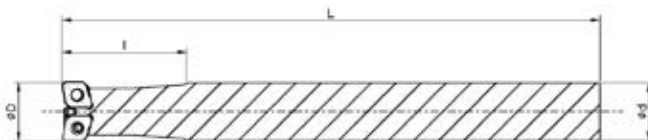


#### CN Indexable Shrink Fit Head CN 捨棄式燒結刀頭

| Item Code<br>規格碼 | Dimensions (mm) 規格 |    |    |    |      |      | Available Tools<br>適用工具 |                                   |                     |
|------------------|--------------------|----|----|----|------|------|-------------------------|-----------------------------------|---------------------|
|                  | D                  | d  | d1 | L  | l    | 齒數T* | Insert<br>刀片            | Screw<br>星形螺絲                     | Screwdriver<br>旗形板手 |
| SCN07-D1602      | 16                 | 16 | 10 | 45 | 35.0 | 2    | CN__07                  | M2.5x6.0x3.6xT8<br>(D07160100112) | T8                  |
| SCN07-D1603      | 16                 | 16 | 10 | 45 | 35.0 | 3    |                         |                                   |                     |
| SCN07-D1702      | 17                 | 16 | 10 | 45 | 35.0 | 2    |                         |                                   |                     |
| SCN07-D1703      | 17                 | 16 | 10 | 45 | 35.0 | 3    |                         |                                   |                     |
| SCN07-D2003      | 20                 | 20 | 12 | 45 | 40.0 | 3    |                         |                                   |                     |
| SCN07-D2004      | 20                 | 20 | 12 | 45 | 40.0 | 4    |                         |                                   |                     |
| SCN07-D2103      | 21                 | 20 | 12 | 45 | 40.0 | 3    |                         |                                   |                     |
| SCN07-D2104      | 21                 | 20 | 12 | 45 | 40.0 | 4    |                         |                                   |                     |

獲台灣專利 字號：新型號 M 512454 號  
Patent of Taiwan No.: M 512454

獲中國專利 字號：201520721653.9  
Patent of China No.: 201520721653.9



#### Holder 整體刀柄

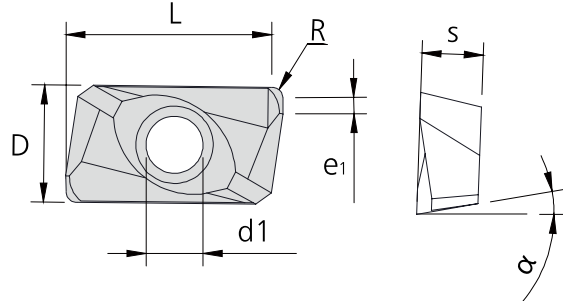
| Item Code<br>規格碼    | Dimensions (mm) 規格 |    |     |    |      | Available Tools<br>適用工具 |                                   |                     |
|---------------------|--------------------|----|-----|----|------|-------------------------|-----------------------------------|---------------------|
|                     | D                  | d  | L   | l  | 齒數T* | Insert<br>刀片            | Screw<br>星形螺絲                     | Screwdriver<br>旗形板手 |
| HCN07-D1602-S16-150 | 16                 | 16 | 150 | 35 | 2    | CN__07                  | M2.5x6.0x3.6xT8<br>(D07160100112) | T8                  |
| HCN07-D1702-S16-150 | 17                 | 16 | 150 | 35 | 2    |                         |                                   |                     |
| HCN07-D2003-S20-150 | 20                 | 20 | 150 | 40 | 3    |                         |                                   |                     |
| HCN07-D2103-S20-150 | 21                 | 20 | 150 | 40 | 3    |                         |                                   |                     |

Unit/單位: mm

Radius End Mill

■ 捨棄式圓鼻銑刀

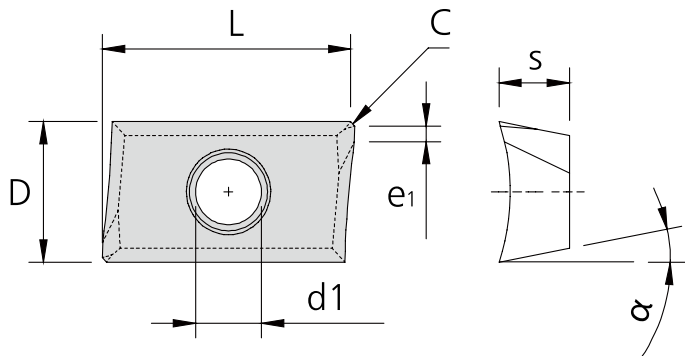
INSERTS 刀片



| Shape<br>外觀 | Order No.<br>品號 | Item code<br>規格碼 | Dimensions(mm)<br>規格 |       |     |      |     |      |     | Coating<br>塗層 | Available Tools<br>適用刀架<br>Shrink Fit Type<br>燒結式<br>Page | P | M | K |
|-------------|-----------------|------------------|----------------------|-------|-----|------|-----|------|-----|---------------|---|---|---|---|
|             |                 |                  | D                    | L     | R   | e1   | d1  | S    | α   |               |   |   |   |   |
|             | JFAP3001        | APKT1003PDER     | 6.7                  | 10    | 0.5 | 1    | 2.8 | 3.5  | 11° | AlTiN         | 311   | ● | ● | ● |
|             | JFAP3002        | APKT1604PDER     | 9.5                  | 15.5  | 0.8 | 1.4  | 4.4 | 5.2  | 11° | AlTiN         |   |   |   |   |
|             | JFAP2001        | APMT1135PDER     | 6.16                 | 10.83 | 0.8 | 1.92 | 2.8 | 3.5  | 11° | AlTiN         |   |   |   |   |
|             | JFAP2002        | APMT1604PDER     | 9.26                 | 16.26 | 0.8 | 2    | 4.6 | 4.76 | 11° | AlTiN         |   |   |   |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用

INSERTS for Aluminum 鋁用刀片



鋁用刀 Insert for aluminum

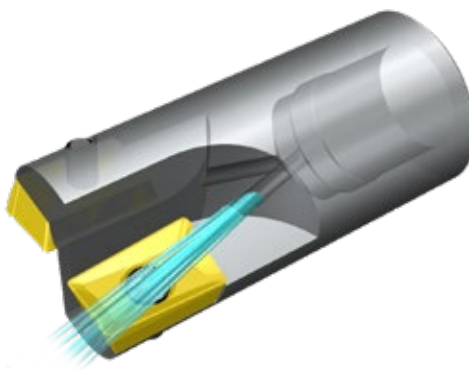
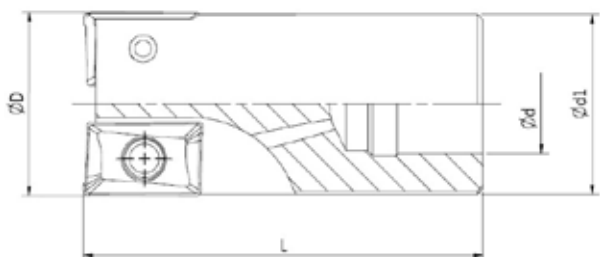
| Shape<br>外觀 | Order No.<br>品號 | Item code<br>規格碼 | Dimensions(mm)<br>規格 |      |     |     |     |      |     | Coating<br>塗層 | Available Tools<br>適用刀架<br>Shrink Fit Type<br>燒結式<br>Page | N |
|-------------|-----------------|------------------|----------------------|------|-----|-----|-----|------|-----|---------------|---|---|
|             |                 |                  | D                    | L    | R   | e1  | d1  | S    | α   |               |   |   |
|             | JFAP1001        | APEX1604PDFR     | 9.5                  | 16.5 | 0.2 | 1.2 | 4.4 | 4.76 | 11° | NO            | 311   | ● |
|             | JFAP1001-al     | APEX1604PDFR     | 9.5                  | 16.5 | 0.2 | 1.2 | 4.4 | 4.76 | 11° | TB<br>(DLC)   |   |   |

●: Main Application 主要應用 ▲: Secondary Application 次要應用



## AP Shrink Fit Head

### ■ AP 捨棄式燒結刀頭



| MODE        | Dimensions (mm) |    |    |    | Teeth | Available Insert | Screw   | Wrench |
|-------------|-----------------|----|----|----|-------|------------------|---------|--------|
| 型號          | D               | d1 | L  | d  | 刃數    | 適用刀片             | 螺絲      | 板手     |
| SAP10-D1602 | 16              | 16 | 45 | 10 | 2     | APKT1003         | MS2506A | T09    |
| SAP10-D1702 | 17              | 16 | 45 | 10 | 2     |                  |         |        |
| SAP10-D2002 | 20              | 20 | 45 | 12 | 2     |                  |         |        |
| SAP10-D2003 | 20              | 20 | 45 | 12 | 3     |                  |         |        |
| SAP10-D2102 | 21              | 20 | 45 | 12 | 2     |                  |         |        |
| SAP10-D2103 | 21              | 20 | 45 | 12 | 3     |                  |         |        |

產品出貨附件為螺絲 & 板手 Product with Screw and Wrench

獲台灣專利字號：新型第 M 512454 號  
Patent of Taiwan No.: M 512454



獲中國專利字號：201520721653.9  
Patent of China No.: 201520721653.9



# Spot Drill / Chamfer Mill + Inserts SET 定點鑽 / 倒角刀 刀具組



## ● Characteristic 特點：

1. For general chamfering and NC spot drilling.  
可廣泛應用於倒角加工及 NC 定點鑽。
2. The multi-edge design make it a cost-efficient solution- 4 times use.  
刀片可轉位四個角, 減少刀具成本。
3. New spotting way, stable center spotting, improve tool life effectively.  
新型刀片定位方式 - 刀片自我定中心、結合穩定, 大幅延長刀具壽命。
4. Newly developed SH + ZrN coating increases the lubrication, lowers the friction, and improves tool performance effectively.  
新表面塗層 SH+ZrN 有效地增加了潤滑性並降低了摩擦, 從而提高了刀具性能。
5. Patent of Taiwan No. : M560955  
專利號 : M560955



Patent of Taiwan: M 560955  
本產品已獲台灣新型專利 字號：M 560955

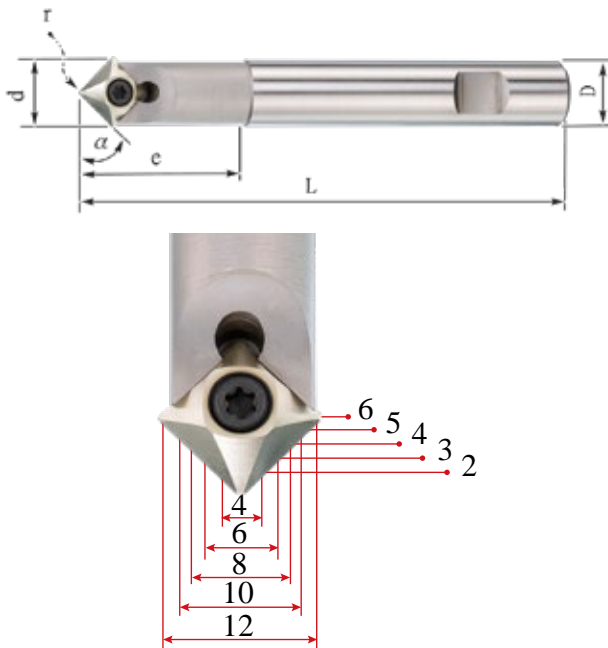
切削  
條件表 **P313**  
Cutting Condition

## Spot Drill / Chamfer Mill + Inserts SET

### ■ 定點鑽/倒角刀 刀具組

| MODE<br>型號      | D  | L   | $\alpha$ | d    | e  | r   | Insert       | Screw  | Wrench |
|-----------------|----|-----|----------|------|----|-----|--------------|--------|--------|
|                 |    |     |          |      |    |     | 刀片           | 螺絲     | 扳手     |
| HSE1245-S16-120 | 16 | 120 | 45°      | 16.9 | 40 | 0.8 | SE12T4(5pcs) | TS4006 | T15    |
| HSE1230-S16-120 | 16 | 120 | 30°      | 20.8 | 40 | 0.8 |              |        |        |

● Recommend Cutting Condition:  
建議加工條件：



#### ※ WARNING 注意：

- Please use high rigidity machine and tool holder.  
請使用較具剛性之機械設備及夾頭。
- Please adjust the Speed and Feed Rate if tool vibration happened on the low rigidity machine.  
機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按右表降低迴轉數及進給速度。
- Recommend the maximum tool over length is 5D.  
Please adjust the parameters according to the actual situation.  
刀具夾持突出量以 5D 為基準，超出上述場合時，請將切削條件做適度調整。



video 切削影片

### Spotting Drill

| Work Material<br>被切削材     | Vc (m/min)<br>切削速度 | fn   | Diameter<br>直徑 | Speed<br>轉速 | Feed Rate<br>進給 |
|---------------------------|--------------------|------|----------------|-------------|-----------------|
| General steel<br>一般鋼      | 100                | 0.06 | 4              | 8000        | 480             |
|                           |                    | 0.04 | 6              | 5300        | 210             |
|                           | 80                 | 0.03 | 8              | 3200        | 95              |
|                           |                    | 0.02 | 12             | 2100        | 40              |
| Carbon steel<br>碳素鋼       | 40                 | 0.05 | 4              | 3200        | 160             |
|                           |                    | 0.04 | 6              | 2100        | 85              |
|                           | 35                 | 0.03 | 8              | 1400        | 40              |
|                           |                    | 0.03 | 10             | 1100        | 30              |
| Non-ferrous alloy<br>非鐵合金 | 150                | 0.06 | 4              | 12000       | 700             |
|                           |                    | 0.06 | 6              | 8000        | 480             |
|                           |                    | 0.06 | 8              | 6000        | 360             |
|                           |                    | 0.06 | 10             | 4800        | 280             |
|                           |                    | 0.06 | 12             | 4000        | 240             |

mm

### Chamfering

| Work Material<br>被切削材 | Vc (m/min)<br>切削速度 | Ap<br>使用深度範圍              | Chamfer<br>倒C角 | Speed<br>轉速 | Feed Rate<br>進給 | fn    |      |      |
|-----------------------|--------------------|---------------------------|----------------|-------------|-----------------|-------|------|------|
| General steel<br>一般鋼  | 120                | 2 ↓                       | 0.5C           | 9500        | 2600            | 0.25  |      |      |
|                       |                    |                           | 1.C            |             | 2100            | 0.22  |      |      |
|                       |                    | 2 ~ 4                     | 0.5C           | 4800        | 1200            | 0.25  |      |      |
|                       |                    |                           | 1.C            |             | 1100            | 0.22  |      |      |
|                       |                    |                           | 2.C            |             | 820             | 0.17  |      |      |
|                       |                    |                           | 0.5C           |             | 800             | 0.25  |      |      |
|                       |                    | 4 ~ 6                     | 1.C            | 3200        | 700             | 0.22  |      |      |
|                       |                    |                           | 2.C            |             | 550             | 0.17  |      |      |
| Carbon steel<br>碳素鋼   | 40                 | 2 ↓                       | 0.5C           | 3200        | 150             | 0.05  |      |      |
|                       |                    |                           | 1.C            |             | 130             | 0.04  |      |      |
|                       |                    | 2 ~ 4                     | 0.5            | 1600        | 80              | 0.05  |      |      |
|                       |                    |                           | 1.C            |             | 65              | 0.04  |      |      |
|                       |                    |                           | 2.C            |             | 50              | 0.03  |      |      |
|                       |                    |                           | 0.5C           |             | 65              | 0.06  |      |      |
|                       |                    | 4 ~ 6                     | 1.C            | 1100        | 55              | 0.05  |      |      |
|                       |                    |                           | 2.C            |             | 45              | 0.04  |      |      |
|                       |                    |                           | 3.C            |             | 35              | 0.03  |      |      |
|                       |                    |                           | 0.5C           |             | 3000            | 0.25  |      |      |
|                       |                    | Non-ferrous alloy<br>非鐵合金 | 150            | 2 ↓         | 0.5C            | 12000 | 2750 | 0.23 |
|                       |                    |                           |                |             | 1.C             |       | 1500 | 0.25 |
| 2 ~ 4                 | 0.5C               |                           |                | 6000        | 1400            | 0.23  |      |      |
|                       | 1.C                |                           |                |             | 1250            | 0.21  |      |      |
|                       | 2.C                |                           |                |             | 1000            | 0.25  |      |      |
|                       | 0.5C               |                           |                |             | 920             | 0.23  |      |      |
| 4 ~ 6                 | 1.C                |                           |                | 4000        | 850             | 0.21  |      |      |
|                       | 2.C                |                           |                |             | 600             | 0.15  |      |      |
|                       | 3.C                |                           |                |             |                 |       |      |      |
|                       | 0.5C               |                           |                |             |                 |       |      |      |

mm

切削  
條件表  
Cutting Condition

**P467**

## Position Drill

### ■ 定位鑽

**600**  
Nano

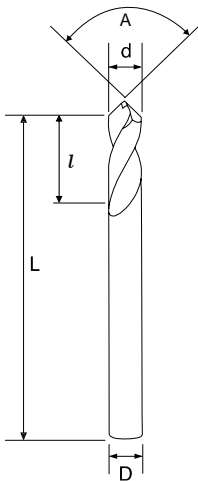
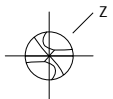
**HRC**  
▶ 45

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Tip Angle |
|------------|----------|--------------|-------------|----------------|-----------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | A 前端角     |
| PDST030900 | 3        | 10           | 50          | 3              | 90°       |
| PDST030120 | 3        | 10           | 50          | 3              | 120°      |
| PDST040900 | 4        | 12           | 50          | 4              | 90°       |
| PDST040120 | 4        | 12           | 50          | 4              | 120°      |
| PDST050900 | 5        | 15           | 50          | 5              | 90°       |
| PDST050120 | 5        | 15           | 50          | 5              | 120°      |
| PDST060900 | 6        | 20           | 60          | 6              | 90°       |
| PDST060120 | 6        | 20           | 60          | 6              | 120°      |
| PDST080900 | 8        | 25           | 60          | 8              | 90°       |
| PDST080120 | 8        | 25           | 60          | 8              | 120°      |
| PDST100900 | 10       | 25           | 75          | 10             | 90°       |
| PDST100120 | 10       | 25           | 75          | 10             | 120°      |
| PDST120900 | 12       | 30           | 75          | 12             | 90°       |
| PDST120120 | 12       | 30           | 75          | 12             | 120°      |
| PDST160900 | 16       | 35           | 100         | 16             | 90°       |
| PDST160120 | 16       | 35           | 100         | 16             | 120°      |
| PDST200900 | 20       | 40           | 100         | 20             | 90°       |
| PDST200120 | 20       | 40           | 100         | 20             | 120°      |



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Titanium ally<br>鈦合金 | Nickel/Inconel<br>ally<br>鎳基金屬 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|----------------------|--------------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                      |                                |                        |                       |
| ○  | ◎                         | ○                     |        |        |        |                        |                      |                                | ○                      | ○                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P467**

## Position Drill

### ■ 定位鑽

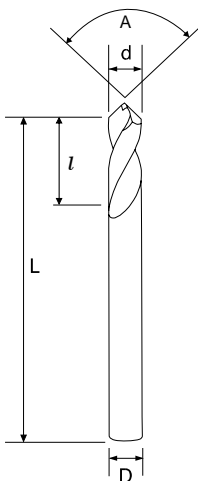
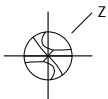
**600**  
Nano

**HRC**  
▶ 50

**ZrN-A**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Flute Length | Full Length | Shank Diameter | Tip Angle |
|-------------|----------|--------------|-------------|----------------|-----------|
| 型號          | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | A 前端角     |
| PDST030900T | 3        | 10           | 50          | 3              | 90°       |
| PDST030120T | 3        | 10           | 50          | 3              | 120°      |
| PDST040900T | 4        | 12           | 50          | 4              | 90°       |
| PDST040120T | 4        | 12           | 50          | 4              | 120°      |
| PDST050900T | 5        | 15           | 50          | 5              | 90°       |
| PDST050120T | 5        | 15           | 50          | 5              | 120°      |
| PDST060900T | 6        | 20           | 60          | 6              | 90°       |
| PDST060120T | 6        | 20           | 60          | 6              | 120°      |
| PDST080900T | 8        | 25           | 60          | 8              | 90°       |
| PDST080120T | 8        | 25           | 60          | 8              | 120°      |
| PDST100900T | 10       | 25           | 75          | 10             | 90°       |
| PDST100120T | 10       | 25           | 75          | 10             | 120°      |
| PDST120900T | 12       | 30           | 75          | 12             | 90°       |
| PDST120120T | 12       | 30           | 75          | 12             | 120°      |
| PDST160900T | 16       | 35           | 100         | 16             | 90°       |
| PDST160120T | 16       | 35           | 100         | 16             | 120°      |
| PDST200900T | 20       | 40           | 100         | 20             | 90°       |
| PDST200120T | 20       | 40           | 100         | 20             | 120°      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Titanium ally<br>鈦合金 | Nickel/Inconel<br>ally<br>鎳基金屬 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|----------------------|--------------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                      |                                |                        |                       |
| ○  | ◎                       | ◎                     | ○      |        |        | ○                      | ○                    | ○                              | ○                      |                       |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P467**

## Position Drill - Long Shank

### 長柄定位鑽

600  
Nano

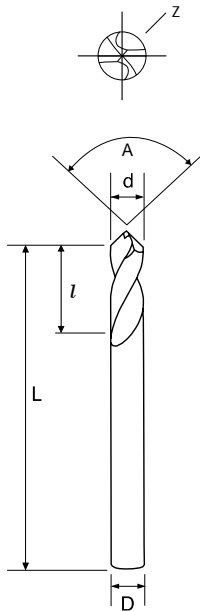
HRC  
45

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE       | Diameter | Flute Length | Full Length | Shank Diameter | Tip Angle |
|------------|----------|--------------|-------------|----------------|-----------|
| 型號         | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | A 前端角     |
| PDST040901 | 4        | 12           | 100         | 4              | 90°       |
| PDST040121 | 4        | 12           | 100         | 4              | 120°      |
| PDST060901 | 6        | 20           | 100         | 6              | 90°       |
| PDST060121 | 6        | 20           | 100         | 6              | 120°      |
| PDST080901 | 8        | 25           | 100         | 8              | 90°       |
| PDST080121 | 8        | 25           | 100         | 8              | 120°      |
| PDST100901 | 10       | 25           | 150         | 10             | 90°       |
| PDST100121 | 10       | 25           | 150         | 10             | 120°      |
| PDST120901 | 12       | 30           | 150         | 12             | 90°       |
| PDST120121 | 12       | 30           | 150         | 12             | 120°      |
| PDST160901 | 16       | 35           | 150         | 16             | 90°       |
| PDST160121 | 16       | 35           | 150         | 16             | 120°      |
| PDST200901 | 20       | 40           | 150         | 20             | 90°       |
| PDST200121 | 20       | 40           | 150         | 20             | 120°      |



- HRC > 40
- HRC > 45**
- HRC > 50
- HRC > 55
- HRC > 60
- HRC > 65
- 
- 
- 
- 
- 
- 
- 
- 
- 
- 

Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>成素鋼, 合金鋼 | Pre-hardened steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Titanium ally<br>鈦合金 | Nickel/Inconel<br>ally<br>鎳基金屬 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|---------------------------|-----------------------|--------|--------|--------|------------------------|----------------------|--------------------------------|------------------------|-----------------------|
|  | ~45HRC                    | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                      |                                |                        |                       |
| ○  | ◎                         | ○                     |        |        |        |                        |                      |                                | ○                      | ○                     |

Unit/單位: mm

切削  
條件表  
Cutting Condition

**P467**

## Position Drill - Long Shank

### ■ 長柄定位鑽

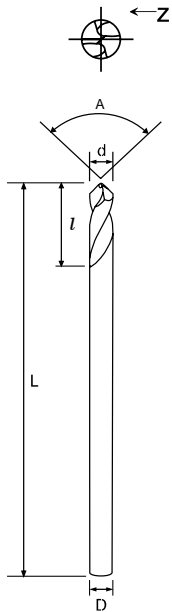
**600**  
Nano

**HRC**  
▶ 50

**ZrN-A**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE        | Diameter | Flute Length | Full Length | Shank Diameter | Tip Angle |
|-------------|----------|--------------|-------------|----------------|-----------|
| 型號          | d 刃徑     | l 刃長         | L 全長        | D 柄徑           | A 前端角     |
| PDST040901T | 4        | 12           | 100         | 4              | 90°       |
| PDST040121T | 4        | 12           | 100         | 4              | 120°      |
| PDST060901T | 6        | 20           | 100         | 6              | 90°       |
| PDST060121T | 6        | 20           | 100         | 6              | 120°      |
| PDST080901T | 8        | 25           | 100         | 8              | 90°       |
| PDST080121T | 8        | 25           | 100         | 8              | 120°      |
| PDST100901T | 10       | 25           | 150         | 10             | 90°       |
| PDST100121T | 10       | 25           | 150         | 10             | 120°      |
| PDST120901T | 12       | 30           | 150         | 12             | 90°       |
| PDST120121T | 12       | 30           | 150         | 12             | 120°      |
| PDST160901T | 16       | 35           | 150         | 16             | 90°       |
| PDST160121T | 16       | 35           | 150         | 16             | 120°      |
| PDST200901T | 20       | 40           | 150         | 20             | 90°       |
| PDST200121T | 20       | 40           | 150         | 20             | 120°      |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>碳素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Titanium ally<br>鈦合金 | Nickel/Inconel<br>ally<br>鎳基合金 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|----------------------|--------------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                      |                                |                        |                       |
| ○  | ◎                       | ◎                     | ○      |        |        | ○                      | ○                    | ○                              | ○                      |                       |

Unit/單位: mm

切削  
條件表 **P468**  
Cutting Condition

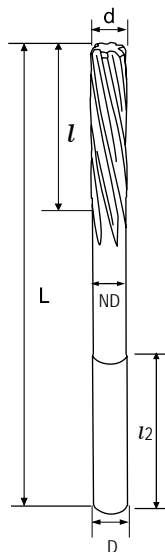
Reamer series

## ■ 鎢鋼絞刀

**600**  
Nano **HRC**  
▶ **65**

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE  | Diameter | Flute Length | Neck Diameter | Shank Length | Full Length | Flutes |
|-------|----------|--------------|---------------|--------------|-------------|--------|
| 型號    | 直徑d      | l 刃長         | ND頸部直徑        | l2 柄長        | L全長         | 刃數Z    |
| RE015 | 1.5      | 8            | 1.35          |              | 40          | 4      |
| RE016 | 1.6      | 9            | 1.4           |              | 43          |        |
| RE017 | 1.7      | 9            | 1.5           |              | 43          |        |
| RE018 | 1.8      | 10           | 1.6           |              | 46          |        |
| RE020 | 2.0      | 11           | 1.8           | 18           | 49          |        |
| RE022 | 2.2      | 12           | 2.0           | 18           | 53          |        |
| RE025 | 2.5      | 14           | 2.6           | 20           | 57          |        |
| RE028 | 2.8      | 15           | 2.6           | 20           | 61          |        |
| RE030 | 3.0      | 16           | 2.8           | 20           | 65          |        |
| RE035 | 3.5      | 18           | 3.3           | 23           | 70          |        |
| RE040 | 4.0      | 19           | 3.7           | 25           | 75          |        |
| RE045 | 4.5      | 21           | 4.2           | 26           | 80          |        |
| RE050 | 5.0      | 23           | 4.7           | 35           | 86          | 6      |
| RE055 | 5.5      | 26           | 5.1           | 35           | 93          |        |
| RE060 | 6.0      | 26           | 5.6           | 35           | 93          |        |
| RE065 | 6.5      | 28           | 6.1           | 32           | 101         |        |
| RE070 | 7.0      | 31           | 6.5           | 36           | 109         |        |
| RE075 | 7.5      | 31           | 6.5           | 36           | 109         |        |
| RE080 | 8.0      | 33           | 7.5           | 42           | 117         |        |
| RE085 | 8.5      | 33           | 7             | 42           | 117         |        |
| RE090 | 9.0      | 36           | 8.0           | 42           | 125         |        |
| RE095 | 9.5      | 36           | 8.0           | 42           | 125         |        |
| RE100 | 10.0     | 38           | 9.0           | 45           | 133         |        |
| RE105 | 10.5     | 38           | 9.0           | 45           | 133         |        |
| RE110 | 11.0     | 41           | 9.0           | 50           | 142         |        |
| RE115 | 11.5     | 41           | 9.0           | 50           | 142         |        |
| RE120 | 12.0     | 44           | 9.0           | 50           | 151         |        |

HRC  
▶ 40

HRC  
▶ 45

HRC  
▶ 50

HRC  
▶ 55

HRC  
▶ 60

HRC  
▶ 65



Application 適用材質：

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                       | ○                     | ○      | ○      | ○      | ○                      | ○                      |                       |



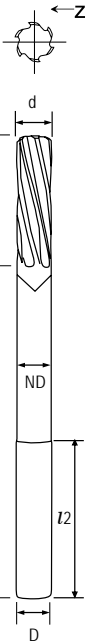
切削條件表  
**P468**  
 Cutting Condition

### Carbide Edge Reamer

## ■ 刃部鎢鋼頭絞刀

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm<sup>2</sup> Grain Size=0.6μm



| MODE   | Diameter | Flute Length | Neck Diameter | Shank Length | Full Length | Shank Diameter | Flutes |
|--------|----------|--------------|---------------|--------------|-------------|----------------|--------|
| 型號     | 直徑d      | l 刃長         | ND 頸部直徑       | l2 柄長        | L 全長        | D 柄徑           | Z 刃數   |
| REC085 | 8.5      | 33           | 7.0           | 42           | 117         | 8              | 6      |
| REC090 | 9.0      | 36           | 8.0           | 42           | 125         | 10             | 6      |
| REC095 | 9.5      | 36           | 8.0           | 42           | 125         | 10             | 6      |
| REC100 | 10.0     | 38           | 9.0           | 42           | 135         | 10             | 6      |
| REC105 | 10.5     | 38           | 9.0           | 45           | 133         | 10             | 6      |
| REC110 | 11.0     | 41           | 9.0           | 50           | 142         | 10             | 6      |
| REC115 | 11.5     | 41           | 9.0           | 50           | 142         | 10             | 6      |
| REC120 | 12.0     | 44           | 9.0           | 50           | 151         | 12             | 6      |
| REC125 | 12.5     | 44           | 9.0           | 50           | 151         | 12             | 6      |
| REC130 | 13.0     | 44           | 11.0          | 50           | 151         | 12             | 6      |
| REC135 | 13.5     | 47           | 11.0          | 58           | 160         | 12             | 8      |
| REC140 | 14.0     | 47           | 11.0          | 58           | 160         | 12             | 8      |
| REC145 | 14.5     | 50           | 11.0          | 58           | 162         | 12             | 8      |
| REC150 | 15.0     | 50           | 11.0          | 58           | 162         | 12             | 8      |
| REC155 | 15.5     | 52           | 11.0          | 58           | 170         | 12             | 8      |
| REC160 | 16.0     | 52           | 11.0          | 58           | 170         | 12             | 8      |

Helix Angle : Tolerance for outer diameter Application : Mold steel and nonmetal material  
 Main character : Specialized in ream process of mold, could reach perfect tolerance for outer diameter, the helix angle more larger, the surface more smooth.

螺旋角 : 7° ~ 12° 公差 : H7

適用材質 : 模具鋼鐵材料及非鐵金屬材質切削用。特別在製造模具時鉸孔作業，可達到非常好的孔徑公差，螺旋角越大，孔的加工面越光滑。

Application 適用材質 :

★ Perfect 最推薦    ◎ Excellent 適合    ○ Good 佳

| carbon steel,<br>Alloy steel<br>炭素鋼, 合金鋼 | Pre-harden steel<br>預硬鋼 | High-hardened<br>高硬度鋼 |        |        |        | Stainless steel<br>不鏽鋼 | Copper alloy<br>銅合金, 銅 | Aluminum alloy<br>鋁合金 |
|--|-------------------------|-----------------------|--------|--------|--------|------------------------|------------------------|-----------------------|
|  | ~45HRC                  | ~50HRC                | ~55HRC | ~60HRC | ~65HRC |                        |                        |                       |
| ○  | ○                       | ○                     | ○      | ○      | ○      | ○                      | ○                      |                       |

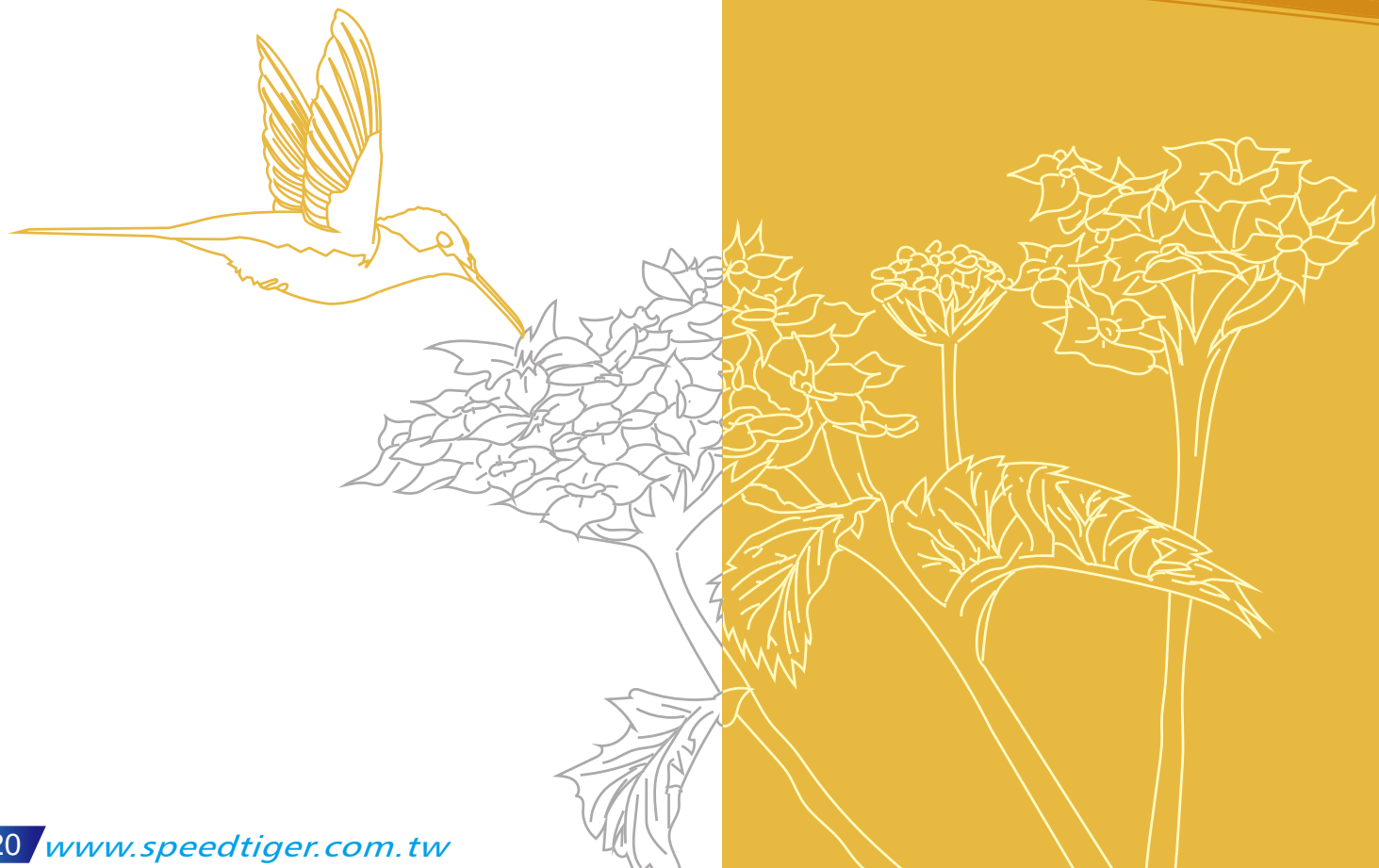
Unit/單位: mm



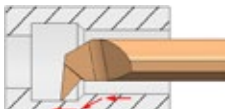

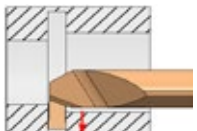
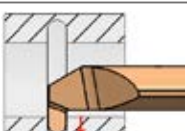



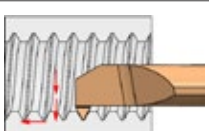


# MINI SPEED

方寸之間，游刃有餘

The Best Solution for Applying to Small Space.  
小徑空間加工的最佳解決方案

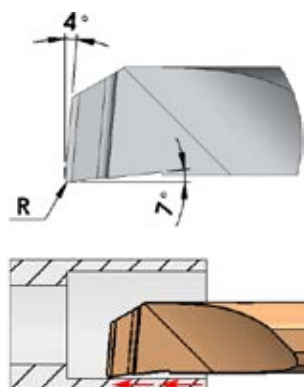
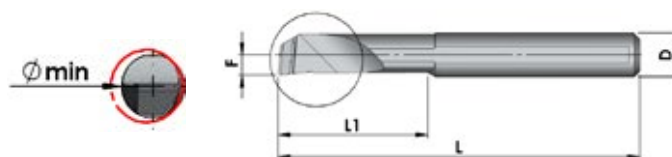
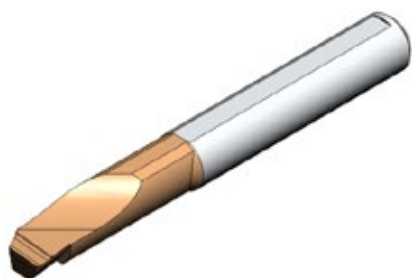


| MODE<br>型號 | Type<br>類型  | Item<br>品名                           | Min. boring diameter<br>最小加工孔徑 | Coating<br>塗層 | Spec.<br>規格表 |
|------------|---|--------------------------------------|--------------------------------|---------------|--------------|
| BR         |    | Boring<br>搪孔                         | Ø0.5mm~Ø8.0mm                  | TISIN         | 322          |
| PF22       |    | Profiling & Boring<br>仿形 & 搪孔        | Ø1.0mm~Ø8.0mm                  | TISIN         | 323          |
| PF47       |    | Profiling & Boring<br>仿形 & 搪孔        | Ø1.0mm~Ø8.0mm                  | TISIN         | 324          |
| BT         |    | Back Turning<br>背車削                  | Ø4.0mm~Ø8.0mm                  | TISIN         | 325          |
| IG         |   | Internal Grooving<br>內徑溝槽            | Ø4.0mm~Ø8.0mm                  | TISIN         | 326          |
| IGR        |  | Internal Grooving<br>Radius<br>內徑圓溝槽 | Ø4.0mm~Ø8.0mm                  | TISIN         | 327          |
| FG         |  | Face Grooving<br>端面溝槽                | Ø4.0mm~Ø8.0mm                  | TISIN         | 328          |
| FGR        |  | Face Grooving Radius<br>端面圓溝槽        | Ø4.0mm~Ø6.0mm                  | TISIN         | 328          |
| CP         |  | Chamfering & Profiling<br>倒角 & 仿形    | Ø1.0mm                         | TISIN         | 329          |
| TA         |  | Threading<br>螺紋車削                    | Ø2.3mm~Ø6.0mm                  | TISIN         | 329          |

## Boring

### ■ 搪孔

切削條件表 **P330**  
Cutting Condition

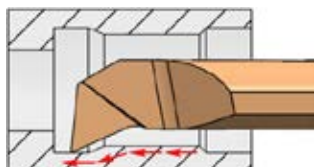
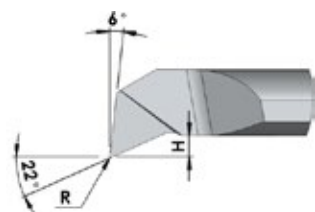
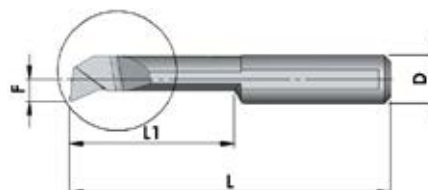
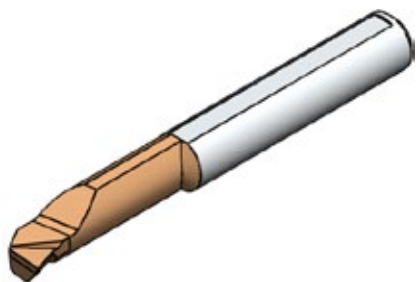


| MODE                | D | Ø min | F   | L   | L1   | R    |
|---------------------|---|-------|-----|-----|------|------|
| 型號                  |   |       |     |     |      |      |
| BR07-05.003-015 R/L | 4 | 0.5   | 0.2 | 50  | 1.5  | 0.03 |
| BR07-05.003-025 R/L | 4 | 0.5   | 0.2 | 50  | 2.5  | 0.03 |
| BR07-10.005-03 R/L  | 4 | 1     | 0.4 | 50  | 3.0  | 0.05 |
| BR07-10.005-05 R/L  | 4 | 1     | 0.4 | 50  | 5.0  | 0.05 |
| BR07-20.005-06 R/L  | 4 | 2     | 0.8 | 50  | 6.0  | 0.05 |
| BR07-20.005-10 R/L  | 4 | 2     | 0.8 | 50  | 10.0 | 0.05 |
| BR07-20.005-14 R/L  | 4 | 2     | 0.8 | 50  | 14.0 | 0.05 |
| BR07-30.010-09 R/L  | 4 | 3     | 1.3 | 50  | 9.0  | 0.1  |
| BR07-30.010-15 R/L  | 4 | 3     | 1.3 | 50  | 15.0 | 0.1  |
| BR07-30.010-21 R/L  | 4 | 3     | 1.3 | 50  | 21.0 | 0.1  |
| BR07-40.010-12 R/L  | 4 | 4     | 1.8 | 50  | 12.0 | 0.1  |
| BR07-40.010-20 R/L  | 4 | 4     | 1.8 | 50  | 20.0 | 0.1  |
| BR07-40.010-28 R/L  | 4 | 4     | 1.8 | 60  | 28.0 | 0.1  |
| BR07-50.020-15 R/L  | 6 | 5     | 2.3 | 50  | 15.0 | 0.2  |
| BR07-50.020-25 R/L  | 6 | 5     | 2.3 | 50  | 25.0 | 0.2  |
| BR07-50.020-35 R/L  | 6 | 5     | 2.3 | 60  | 35.0 | 0.2  |
| BR07-60.020-18 R/L  | 6 | 6     | 2.8 | 50  | 18.0 | 0.2  |
| BR07-60.020-30 R/L  | 6 | 6     | 2.8 | 60  | 30.0 | 0.2  |
| BR07-60.020-42 R/L  | 6 | 6     | 2.8 | 75  | 42.0 | 0.2  |
| BR07-70.020-21 R/L  | 8 | 7     | 3.3 | 60  | 21.0 | 0.2  |
| BR07-70.020-35 R/L  | 8 | 7     | 3.3 | 75  | 35.0 | 0.2  |
| BR07-70.020-49 R/L  | 8 | 7     | 3.3 | 100 | 49.0 | 0.2  |
| BR07-80.020-24 R/L  | 8 | 8     | 3.8 | 60  | 24.0 | 0.2  |
| BR07-80.020-40 R/L  | 8 | 8     | 3.8 | 75  | 40.0 | 0.2  |
| BR07-80.020-56 R/L  | 8 | 8     | 3.8 | 100 | 56.0 | 0.2  |

## Profiling & Boring

### 仿形&搪孔

切削  
條件表 **P330**  
Cutting Condition



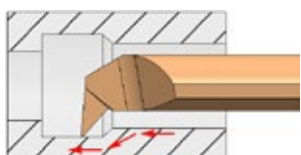
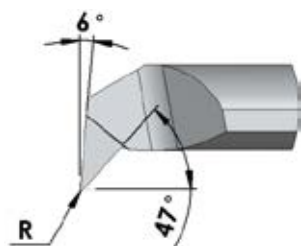
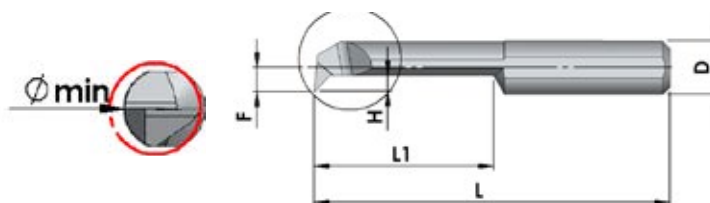
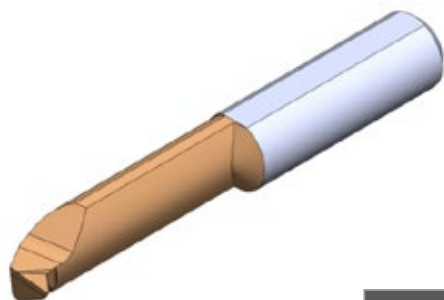
| MODE               | D | $\varnothing \text{ min}$ | F   | L   | L1 | R    | H   |
|--------------------|---|---------------------------|-----|-----|----|------|-----|
| 型號                 |   |                           |     |     |    |      |     |
| PF22-10.005-03 R/L | 4 | 1                         | 0.4 | 50  | 3  | 0.05 | 0.2 |
| PF22-10.005-05 R/L | 4 | 1                         | 0.4 | 50  | 5  | 0.05 | 0.2 |
| PF22-20.005-06 R/L | 4 | 2                         | 0.8 | 50  | 6  | 0.05 | 0.4 |
| PF22-20.005-10 R/L | 4 | 2                         | 0.8 | 50  | 10 | 0.05 | 0.4 |
| PF22-20.005-14 R/L | 4 | 2                         | 0.8 | 50  | 14 | 0.05 | 0.4 |
| PF22-30.010-09 R/L | 4 | 3                         | 1.3 | 50  | 9  | 0.1  | 0.6 |
| PF22-30.010-15 R/L | 4 | 3                         | 1.3 | 50  | 15 | 0.1  | 0.6 |
| PF22-30.010-21 R/L | 4 | 3                         | 1.3 | 50  | 21 | 0.1  | 0.6 |
| PF22-40.010-12 R/L | 4 | 4                         | 1.8 | 50  | 12 | 0.1  | 0.8 |
| PF22-40.010-20 R/L | 4 | 4                         | 1.8 | 50  | 20 | 0.1  | 0.8 |
| PF22-40.010-28 R/L | 4 | 4                         | 1.8 | 60  | 28 | 0.1  | 0.8 |
| PF22-50.020-15 R/L | 6 | 5                         | 2.3 | 50  | 15 | 0.2  | 1   |
| PF22-50.020-25 R/L | 6 | 5                         | 2.3 | 50  | 25 | 0.2  | 1   |
| PF22-50.020-30 R/L | 6 | 5                         | 2.3 | 60  | 30 | 0.2  | 1   |
| PF22-60.020-18 R/L | 6 | 6                         | 2.8 | 50  | 18 | 0.2  | 1.2 |
| PF22-60.020-30 R/L | 6 | 6                         | 2.8 | 60  | 30 | 0.2  | 1.2 |
| PF22.60.020-42 R/L | 6 | 6                         | 2.8 | 75  | 42 | 0.2  | 1.2 |
| PF22-70.020-21 R/L | 8 | 7                         | 3.3 | 60  | 21 | 0.2  | 1.4 |
| PF22-70.020-35 R/L | 8 | 7                         | 3.3 | 75  | 35 | 0.2  | 1.4 |
| PF22-70.020-49 R/L | 8 | 7                         | 3.3 | 100 | 49 | 0.2  | 1.4 |
| PF22-80.020-24 R/L | 8 | 8                         | 3.8 | 60  | 24 | 0.2  | 1.6 |
| PF22-80.020-40 R/L | 8 | 8                         | 3.8 | 75  | 40 | 0.2  | 1.6 |
| PF22-80.020-56 R/L | 8 | 8                         | 3.8 | 100 | 56 | 0.2  | 1.6 |

## Profiling & Boring

### 仿形&搪孔

切削  
條件表 **P330**  
Cutting Condition

TiSiN



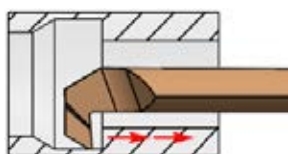
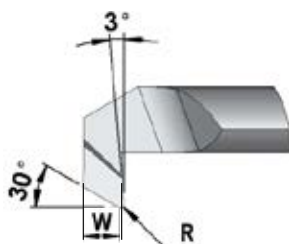
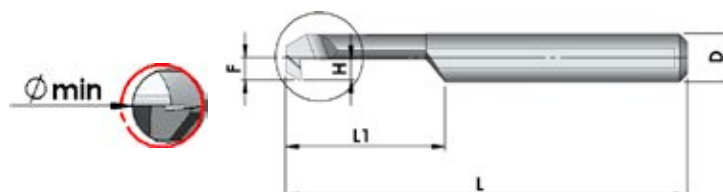
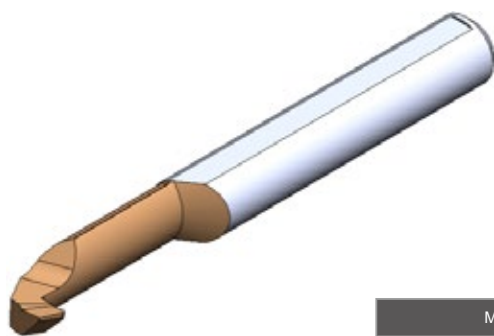
| MODE               | D | Ø min | F   | L   | L1 | R    | H   |
|--------------------|---|-------|-----|-----|----|------|-----|
| 型號                 |   |       |     |     |    |      |     |
| PF47-10.005-03 R/L | 4 | 1     | 0.4 | 50  | 3  | 0.05 | 0.2 |
| PF47-10.005-05 R/L | 4 | 1     | 0.4 | 50  | 5  | 0.05 | 0.2 |
| PF47-20.005-06 R/L | 4 | 2     | 0.8 | 50  | 6  | 0.05 | 0.4 |
| PF47-20.005-10 R/L | 4 | 2     | 0.8 | 50  | 10 | 0.05 | 0.4 |
| PF47-20.005-14 R/L | 4 | 2     | 0.8 | 50  | 14 | 0.05 | 0.4 |
| PF47-30.010-09 R/L | 4 | 3     | 1.3 | 50  | 9  | 0.1  | 0.6 |
| PF47-30.010-15 R/L | 4 | 3     | 1.3 | 50  | 15 | 0.1  | 0.6 |
| PF47-30.010-21 R/L | 4 | 3     | 1.3 | 50  | 21 | 0.1  | 0.6 |
| PF47-40.010-12 R/L | 4 | 4     | 1.8 | 50  | 12 | 0.1  | 0.8 |
| PF47-40.010-20 R/L | 4 | 4     | 1.8 | 50  | 20 | 0.1  | 0.8 |
| PF47-40.010-28 R/L | 4 | 4     | 1.8 | 60  | 28 | 0.1  | 0.8 |
| PF47-50.020-15 R/L | 6 | 5     | 2.3 | 50  | 15 | 0.2  | 1   |
| PF47-50.020-25 R/L | 6 | 5     | 2.3 | 50  | 25 | 0.2  | 1   |
| PF47-50.020-35 R/L | 6 | 5     | 2.3 | 60  | 35 | 0.2  | 1   |
| PF47-60.020-18 R/L | 6 | 6     | 2.8 | 50  | 18 | 0.2  | 1.2 |
| PF47-60.020-30 R/L | 6 | 6     | 2.8 | 60  | 30 | 0.2  | 1.2 |
| PF47.60.020-42 R/L | 6 | 6     | 2.8 | 75  | 42 | 0.2  | 1.2 |
| PF47-70.020-21 R/L | 8 | 7     | 3.3 | 60  | 21 | 0.2  | 1.4 |
| PF47-70.020-35 R/L | 8 | 7     | 3.3 | 75  | 35 | 0.2  | 1.4 |
| PF47-70.020-49 R/L | 8 | 7     | 3.3 | 100 | 49 | 0.2  | 1.4 |
| PF47-80.020-24 R/L | 8 | 8     | 3.8 | 60  | 24 | 0.2  | 1.6 |
| PF47-80.020-40 R/L | 8 | 8     | 3.8 | 75  | 40 | 0.2  | 1.6 |
| PF47-80.020-56 R/L | 8 | 8     | 3.8 | 100 | 56 | 0.2  | 1.6 |

## Back Turning

### ■ 背車削

切削  
條件表 **P330**  
Cutting Condition

TiSiN



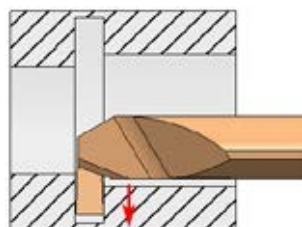
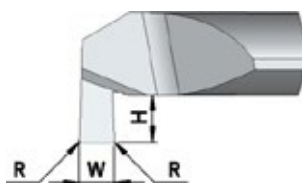
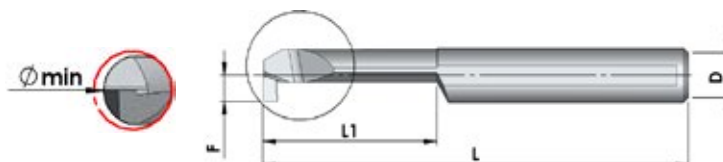
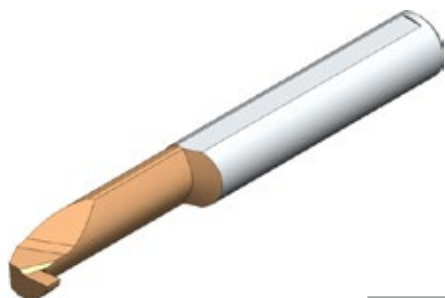
| MODE               | D | Ø min | F   | L  | L1 | R   | H   | W   |
|--------------------|---|-------|-----|----|----|-----|-----|-----|
| 型號                 |   |       |     |    |    |     |     |     |
| BT30-40.010-12 R/L | 4 | 4     | 1.8 | 50 | 12 | 0.1 | 1   | 1.5 |
| BT30-40.010-20 R/L | 4 | 4     | 1.8 | 50 | 20 | 0.1 | 1   | 1.5 |
| BT30-60.020-18 R/L | 6 | 6     | 2.8 | 50 | 18 | 0.2 | 1.5 | 2   |
| BT30-60.020-30 R/L | 6 | 6     | 2.8 | 60 | 30 | 0.2 | 1.5 | 2.5 |
| BT30-80.020-24 R/L | 8 | 8     | 3.8 | 60 | 24 | 0.2 | 2   | 2.5 |
| BT30-80.020-40 R/L | 8 | 8     | 3.8 | 75 | 40 | 0.2 | 2   | 2.5 |

## Internal Grooving

### ■ 內徑溝槽

切削條件表 **P330**  
Cutting Condition

TISIN



| MODE               | D | Ø min | F   | L  | L1 | W   | R    | H   |
|--------------------|---|-------|-----|----|----|-----|------|-----|
| 型號                 |   |       |     |    |    |     |      |     |
| IG05-40.005-10 R/L | 4 | 4     | 1.8 | 50 | 10 | 0.5 | 0.05 | 0.5 |
| IG05-40.005-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 0.5 | 0.05 | 0.5 |
| IG10-40.010-10 R/L | 4 | 4     | 1.8 | 50 | 10 | 1.0 | 0.10 | 1.0 |
| IG10-40.010-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 1.0 | 0.10 | 1.0 |
| IG15-40.015-10 R/L | 4 | 4     | 1.8 | 50 | 10 | 1.5 | 0.15 | 1.0 |
| IG15-40.015-15 R/L | 4 | 4     | 1.8 | 60 | 15 | 1.5 | 0.15 | 1.0 |
| IG10-50.010-15 R/L | 6 | 5     | 2.3 | 50 | 15 | 1.0 | 0.10 | 1.2 |
| IG10-50.010-25 R/L | 6 | 5     | 2.3 | 50 | 25 | 1.0 | 0.10 | 1.2 |
| IG15-50.015-15 R/L | 6 | 5     | 2.3 | 50 | 15 | 1.5 | 0.15 | 1.2 |
| IG15-50.015-25 R/L | 6 | 5     | 2.3 | 50 | 25 | 1.5 | 0.15 | 1.2 |
| IG20-50.020-15 R/L | 6 | 5     | 2.3 | 50 | 15 | 2.0 | 0.20 | 1.2 |
| IG20-50.020-25 R/L | 6 | 5     | 2.3 | 50 | 25 | 2.0 | 0.20 | 1.2 |
| IG10-60.010-15 R/L | 6 | 6     | 2.8 | 50 | 15 | 1.0 | 0.10 | 1.5 |
| IG10-60.010-25 R/L | 6 | 6     | 2.8 | 50 | 25 | 1.0 | 0.10 | 1.5 |
| IG15-60.015-15 R/L | 6 | 6     | 2.8 | 50 | 15 | 1.5 | 0.15 | 1.5 |
| IG15-60.015-25 R/L | 6 | 6     | 2.8 | 50 | 25 | 1.5 | 0.15 | 1.5 |
| IG20-60.020-15 R/L | 6 | 6     | 2.8 | 50 | 15 | 2.0 | 0.20 | 1.5 |
| IG20-60.020-25 R/L | 6 | 6     | 2.8 | 50 | 25 | 2.0 | 0.20 | 1.5 |
| IG10-70.010-20 R/L | 8 | 7     | 3.3 | 60 | 20 | 1.0 | 0.10 | 1.8 |
| IG10-70.010-30 R/L | 8 | 7     | 3.3 | 75 | 30 | 1.0 | 0.10 | 1.8 |
| IG15-70.015-20 R/L | 8 | 7     | 3.3 | 60 | 20 | 1.5 | 0.15 | 2.0 |
| IG15-70.015-30 R/L | 8 | 7     | 3.3 | 75 | 30 | 1.5 | 0.15 | 2.0 |
| IG20-70.020-20 R/L | 8 | 7     | 3.3 | 60 | 20 | 2.0 | 0.20 | 2.5 |
| IG20-70.020-30 R/L | 8 | 7     | 3.3 | 75 | 30 | 2.0 | 0.20 | 2.5 |
| IG10-80.010-20 R/L | 8 | 8     | 3.8 | 60 | 20 | 1.0 | 0.10 | 1.8 |
| IG10-80.010-30 R/L | 8 | 8     | 3.8 | 75 | 30 | 1.0 | 0.10 | 1.8 |
| IG15-80.015-20 R/L | 8 | 8     | 3.8 | 60 | 20 | 1.5 | 0.15 | 2.0 |
| IG15-80.015-30 R/L | 8 | 8     | 3.8 | 75 | 30 | 1.5 | 0.15 | 2.0 |
| IG20-80.020-20 R/L | 8 | 8     | 3.8 | 60 | 20 | 2.0 | 0.20 | 2.5 |
| IG20-80.020-30 R/L | 8 | 8     | 3.8 | 75 | 30 | 2.0 | 0.20 | 2.5 |

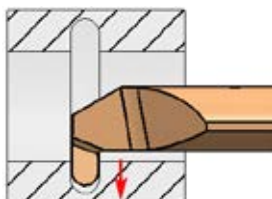
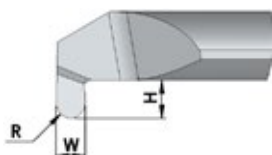
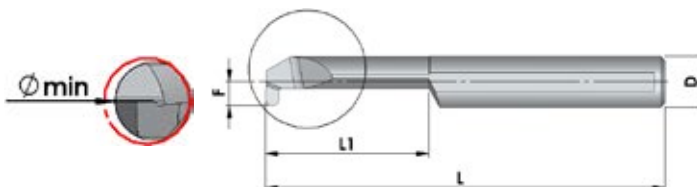
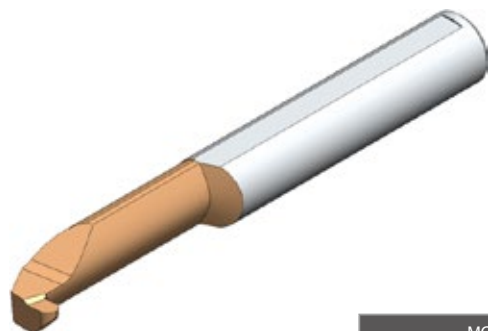


## Internal Grooving Radius

### ■ 內徑圓溝槽

切削  
條件表 **P330**  
Cutting Condition

**TiSiN**



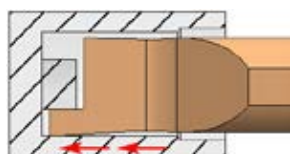
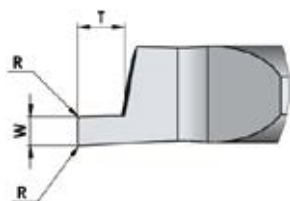
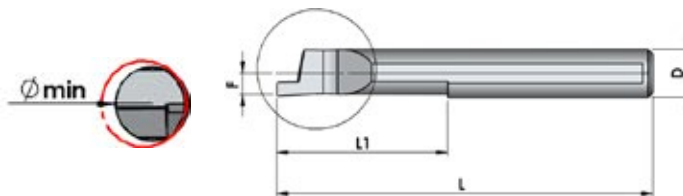
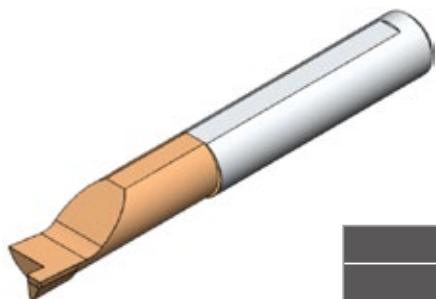
| MODE                | D | Ø min | F   | L  | L1 | W   | R    | H   |
|---------------------|---|-------|-----|----|----|-----|------|-----|
| 型號                  |   |       |     |    |    |     |      |     |
| IGR10-40.050-12 R/L | 4 | 4     | 1.8 | 50 | 12 | 1.0 | 0.50 | 1.0 |
| IGR15-40.075-12R/L  | 4 | 4     | 1.8 | 50 | 12 | 1.5 | 0.75 | 1.0 |
| IGR20-40.100-12 R/L | 4 | 4     | 1.8 | 50 | 12 | 2.0 | 1.00 | 1.3 |
| IGR10-60.050-18 R/L | 6 | 6     | 2.8 | 50 | 18 | 1.0 | 0.50 | 1.6 |
| IGR15-60.075-18 R/L | 6 | 6     | 2.8 | 50 | 18 | 1.5 | 0.75 | 1.6 |
| IGR20-60.100-18 R/L | 6 | 6     | 2.8 | 50 | 18 | 2.0 | 1.00 | 1.6 |
| IGR10-80.050-24 R/L | 8 | 8     | 3.8 | 60 | 24 | 1.0 | 0.50 | 2.5 |
| IGR15-80.075-24 R/L | 8 | 8     | 3.8 | 60 | 24 | 1.5 | 0.75 | 2.5 |
| IGR20-80.100-24 R/L | 8 | 8     | 3.8 | 60 | 24 | 2.0 | 1.00 | 2.5 |

## Face Grooving

### ■ 端面溝槽

切削  
條件表 **P330**  
Cutting Condition

TiSiN



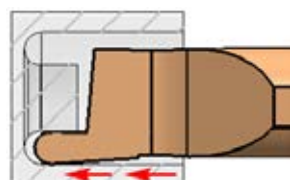
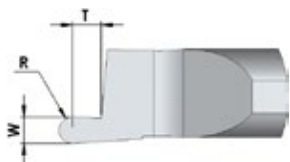
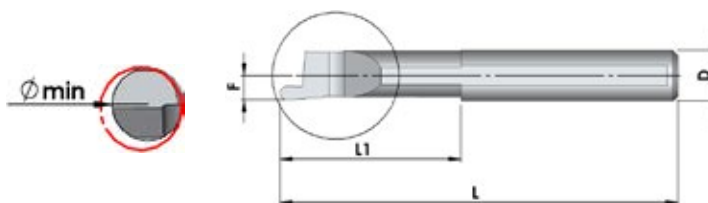
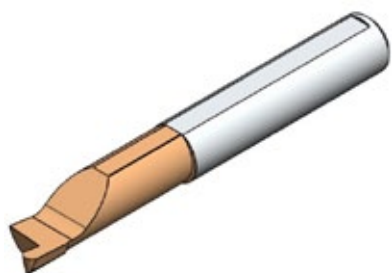
| MODE                | D | Ø min | F   | L  | L1 | W    | R   | T   |
|---------------------|---|-------|-----|----|----|------|-----|-----|
| 型號                  |   |       |     |    |    |      |     |     |
| FG075-40.010-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 0.75 | 0.1 | 1.2 |
| FG100-40.010-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 1.00 | 0.1 | 1.5 |
| FG150-40.010-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 1.50 | 0.1 | 2.6 |
| FG075-50.010-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 0.75 | 0.1 | 1.2 |
| FG100-50.010-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 1.00 | 0.1 | 1.5 |
| FG150-50.010-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 1.50 | 0.1 | 2.5 |
| FG200-50.010-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 2.00 | 0.1 | 3.6 |
| FG100-60.010-22R/L  | 6 | 6     | 2.8 | 50 | 22 | 1.00 | 0.1 | 1.5 |
| FG150-60.010-22R/L  | 6 | 6     | 2.8 | 50 | 22 | 1.50 | 0.1 | 2.5 |
| FG200-60.010-22 R/L | 6 | 6     | 2.8 | 50 | 22 | 2.00 | 0.1 | 3.0 |
| FG250-60.010-22 R/L | 6 | 6     | 2.8 | 50 | 22 | 2.50 | 0.1 | 4.6 |
| FG250-80.010-22 R/L | 8 | 8     | 3.8 | 60 | 22 | 2.50 | 0.1 | 4.6 |

## Face Grooving Radius

### ■ 端面圓溝槽

切削  
條件表 **P330**  
Cutting Condition

TiSiN

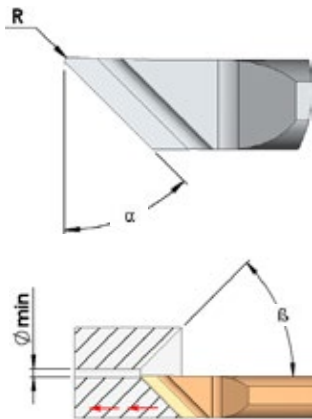
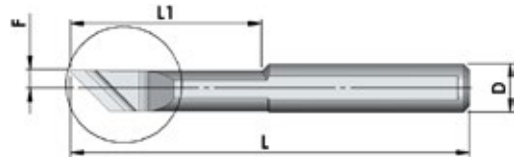
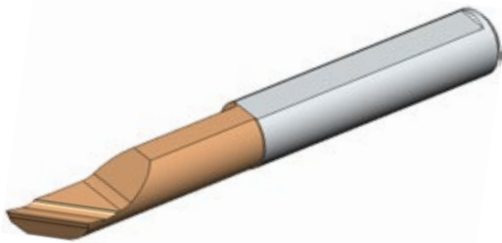


| MODE                 | D | Ø min | F   | L  | L1 | W   | R    | T   |
|----------------------|---|-------|-----|----|----|-----|------|-----|
| 型號                   |   |       |     |    |    |     |      |     |
| FGR100-40.050-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 1.0 | 0.50 | 1.2 |
| FGR150-40.075-15 R/L | 4 | 4     | 1.8 | 50 | 15 | 1.5 | 0.75 | 1.5 |
| FGR100-50.050-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 1.0 | 0.50 | 1.2 |
| FGR150-50.075-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 1.5 | 0.75 | 1.5 |
| FGR200-50.100-22 R/L | 6 | 5     | 2.3 | 50 | 22 | 2.0 | 1.00 | 2.5 |
| FGR100-60.050-22 R/L | 6 | 6     | 2.3 | 50 | 22 | 1.0 | 0.50 | 1.2 |
| FGR150-60.075-22R/L  | 6 | 6     | 2.8 | 50 | 22 | 1.5 | 0.75 | 1.5 |
| FGR200-60.100-22R/L  | 6 | 6     | 2.8 | 50 | 22 | 2.0 | 1.00 | 2.5 |

## Chamfering & Profiling ■ 倒角&仿形

切削  
條件表 **P330**  
Cutting Condition

TiSiN

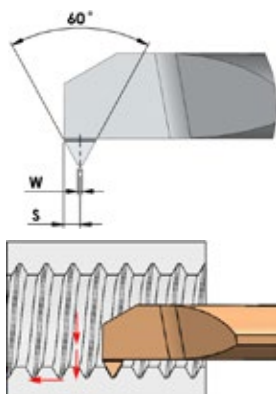
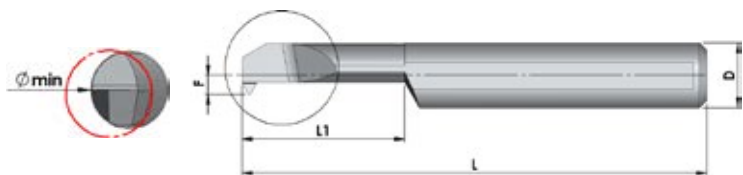
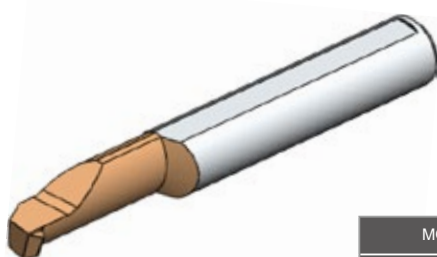


| MODE<br>型號     | D   | Ø min | F   | L  | L1 | α  | β  | R   |
|----------------|-----|-------|-----|----|----|----|----|-----|
| CP30-10.020-18 | 6.0 | 1     | 2.3 | 50 | 18 | 30 | 60 | 0.2 |
| CP45-10.020-18 | 6.0 | 1     | 2.3 | 50 | 18 | 45 | 45 | 0.2 |
| CP60-10.020-18 | 6.0 | 1     | 2.3 | 50 | 18 | 60 | 30 | 0.2 |

## Threading ■ 螺紋車削

切削  
條件表 **P331**  
Cutting Condition

TiSiN



| MODE<br>型號     | D | Ø min | F   | P(mm)    | P(TPI) | L  | L1 | S    | W    |
|----------------|---|-------|-----|----------|--------|----|----|------|------|
| TA60-23-08 R/L | 4 | 2.3   | 1.0 | 0.2-0.5  | 80-48  | 50 | 8  | 0.45 | 0.03 |
| TA60-30-15 R/L | 4 | 3.0   | 1.3 | 0.5-0.75 | 40-36  | 50 | 15 | 0.75 | 0.06 |
| TA60-40-15 R/L | 4 | 4.0   | 1.8 | 0.5-1.0  | 40-24  | 50 | 15 | 0.75 | 0.06 |
| TA60-60-20 R/L | 6 | 6.0   | 2.8 | 0.75-1.5 | 36-18  | 50 | 20 | 0.80 | 0.09 |

BR

產品規格表 **P322**  
Specification page

PF22

產品規格表 **P323**  
Specification page

PF47

產品規格表 **P324**  
Specification page

BT

產品規格表 **P325**  
Specification page

IG

產品規格表 **P326**  
Specification page

IGR

產品規格表 **P327**  
Specification page

FG/FGR

產品規格表 **P328**  
Specification page

CP

產品規格表 **P329**  
Specification page

### Internal Turning (Boring & Profiling) 內徑車削 (搪孔 & 仿形)

| Work Materials<br>被切削材料        | Vc(m/min) | F(mm/rev) | Work Materials<br>被切削材料         | Vc(m/min) | F(mm/rev) |
|--------------------------------|-----------|-----------|---------------------------------|-----------|-----------|
|                                | 切削速度      | 進給        |                                 | 切削速度      | 進給        |
| 低碳鋼, 易削鋼<br>S10C, SUM22等...    | 50-140    | 0.01-0.12 | 碳鋼, 合金鋼<br>S45C, SCM415等...     | 30-120    | 0.01-0.1  |
| 不鏽鋼<br>SUS303, SUS430等...      | 20-100    | 0.01-0.1  | 灰鑄鐵, 球墨鑄鐵<br>FC200, FCD400等...  | 30-100    | 0.01-0.08 |
| 鋁合金<br>A5052, A6061, A7025等... | 50-140    | 0.01-0.12 | 鈦合金, 耐熱合金<br>Ti-6Al-4V(TC4)等... | 20-80     | 0.01-0.08 |
| 黃銅<br>C2801, C3604等...         | 50-150    | 0.01-0.12 |                                 |           |           |

### Internal Cutting 內徑槽切削

| Work Materials<br>被切削材料        | Vc(m/min) | F(mm/rev) | Work Materials<br>被切削材料         | Vc(m/min) | F(mm/rev) |
|--------------------------------|-----------|-----------|---------------------------------|-----------|-----------|
|                                | 切削速度      | 進給        |                                 | 切削速度      | 進給        |
| 低碳鋼, 易削鋼<br>S10C, SUM22等...    | 50-140    | 0.01-0.04 | 碳鋼, 合金鋼<br>S45C, SCM415等...     | 30-120    | 0.01-0.04 |
| 不鏽鋼<br>SUS303, SUS430等...      | 20-100    | 0.01-0.04 | 灰鑄鐵, 球墨鑄鐵<br>FC200, FCD400等...  | 30-100    | 0.01-0.04 |
| 鋁合金<br>A5052, A6061, A7025等... | 50-140    | 0.01-0.04 | 鈦合金, 耐熱合金<br>Ti-6Al-4V(TC4)等... | 20-80     | 0.01-0.04 |
| 黃銅<br>C2801, C3604等...         | 50-150    | 0.01-0.04 |                                 |           |           |

### Face Cutting 端面槽切削

| Work Materials<br>被切削材料        | Vc(m/min) | F(mm/rev) | Work Materials<br>被切削材料         | Vc(m/min) | F(mm/rev) |
|--------------------------------|-----------|-----------|---------------------------------|-----------|-----------|
|                                | 切削速度      | 進給        |                                 | 切削速度      | 進給        |
| 低碳鋼, 易削鋼<br>S10C, SUM22等...    | 50-140    | 0.01-0.06 | 碳鋼, 合金鋼<br>S45C, SCM415等...     | 30-120    | 0.01-0.06 |
| 不鏽鋼<br>SUS303, SUS430等...      | 20-100    | 0.01-0.06 | 灰鑄鐵, 球墨鑄鐵<br>FC200, FCD400等...  | 30-100    | 0.01-0.06 |
| 鋁合金<br>A5052, A6061, A7025等... | 50-140    | 0.01-0.06 | 鈦合金, 耐熱合金<br>Ti-6Al-4V(TC4)等... | 20-80     | 0.01-0.06 |
| 黃銅<br>C2801, C3604等...         | 50-150    | 0.01-0.06 |                                 |           |           |

TA

產品規格表 **P329**  
Specification page

• Internal Threading 內徑螺紋切削

| Work Materials<br>被切削材料      | Vc(m/min) | P-0.5mm                  | P-0.75mm                 | P-1.0mm                  | P-1.25mm                 | P-1.5mm                  |
|------------------------------|-----------|--------------------------|--------------------------|--------------------------|--------------------------|--------------------------|
|                              | 切削速度      | Number of Passes<br>進刀次數 | Number of Passes<br>進刀次數 | Number of Passes<br>進刀次數 | Number of Passes<br>進刀次數 | Number of Passes<br>進刀次數 |
| 低碳鋼，易削鋼<br>S10C，SUM22等...    | 50-150    | 5~7                      | 7~9                      | 9~11                     | 11~14                    | 14~17                    |
| 碳鋼，合金鋼<br>S45C，SCM415等...    | 30-120    | 6~8                      | 8~10                     | 10~12                    | 12~15                    | 15~18                    |
| 不鏽鋼<br>SUS303，SUS430等...     | 20-100    | 8~10                     | 10~12                    | 12~14                    | 15~17                    | 18~20                    |
| 灰鑄鐵，球墨鑄鐵<br>FC200，FCD400等... | 30-100    | 7~9                      | 9~11                     | 11~13                    | 14~16                    | 17~19                    |
| 鋁合金<br>A5052，A6061，A7025等... | 50-150    | 6~8                      | 8~10                     | 10~12                    | 12~14                    | 15~17                    |
| 黃銅<br>C2801，C3604等...        | 50-150    | 6~8                      | 8~10                     | 10~12                    | 12~14                    | 15~17                    |

P-MIE

產品規格表 **P36**  
Specification page

P-SLE/P-MLE

產品規格表 **P45**  
Specification page

SUMIE

產品規格表 **P194**  
Specification page

SUPE

產品規格表 **P195**  
Specification page

### ● P-MIE, P-SLE/P-MLE, SUMIE, SUPE, 2 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Copper<br>銅                          |                               |               | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼, 合金鋼 -HRC30 |                               |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼, 工具鋼 |                               |               | Austenitic stainless steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                               |               | Hardened steels<br>SKD61, SKD11,<br>NAK, STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                               |               |
|-----------------------|--------------------------------------|-------------------------------|---------------|---|-------------------------------|---------------|---|-------------------------------|---------------|---|-------------------------------|---------------|--|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 80~150m/min                          |                               |               | 50~100m/min   |                               |               | 50~70m/min  |                               |               | 30~60m/min  |                               |               | 20~40m/min   |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |                                      | Side Milling<br>側面            | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |  | Side Milling<br>側面            | Slotting<br>溝 |
| 0.2                   | 40,000                               | 90                            | 30            | 40,000  | -                             | 120           | 40,000  | -                             | 100           | 28,000  | -                             | 60            | 32,000   | -                             | 25            |
| 0.3                   | 40,000                               | 130                           | 40            | 40,000  | -                             | 160           | 40,000  | -                             | 120           | 28,000  | -                             | 70            | 32,000   | -                             | 35            |
| 0.4                   | 40,000                               | 170                           | 55            | 40,000  | -                             | 200           | 40,000  | -                             | 160           | 28,000  | -                             | 90            | 24,000   | -                             | 35            |
| 0.5                   | 40,000                               | 210                           | 70            | 40,000  | 320                           | 250           | 40,000  | 240                           | 190           | 25,000  | 200                           | 120           | 19,000   | 75                            | 60            |
| 0.6                   | 40,000                               | 245                           | 85            | 38,000  | 380                           | 300           | 33,000  | 270                           | 210           | 21,000  | 220                           | 130           | 16,000   | 75                            | 60            |
| 0.7                   | 40,000                               | 285                           | 95            | 36,000  | 420                           | 330           | 28,000  | 300                           | 240           | 18,000  | 240                           | 140           | 14,000   | 75                            | 60            |
| 0.8                   | 40,000                               | 330                           | 110           | 34,000  | 480                           | 380           | 25,000  | 340                           | 270           | 16,000  | 260                           | 150           | 12,000   | 75                            | 60            |
| 0.9                   | 40,000                               | 375                           | 125           | 32,000  | 540                           | 430           | 22,000  | 370                           | 290           | 14,000  | 280                           | 160           | 10,600   | 75                            | 60            |
| 1                     | 40,000                               | 420                           | 140           | 30,000  | 600                           | 480           | 20,000  | 400                           | 320           | 12,600  | 300                           | 180           | 9,600  | 75                            | 60            |
| 1.5                   | 32,000                               | 800                           | 270           | 20,000  | 600                           | 480           | 14,000  | 400                           | 320           | 8,400   | 300                           | 180           | 6,400  | 75                            | 60            |
| 2                     | 24,000                               | 1,000                         | 330           | 15,000  | 600                           | 480           | 10,000  | 400                           | 400           | 6,300   | 300                           | 180           | 4,800  | 75                            | 60            |
| 2.5                   | 19,000                               | 1,000                         | 330           | 12,000  | 600                           | 480           | 8,200   | 400                           | 320           | 5,100   | 300                           | 180           | 3,800  | 75                            | 60            |
| 3                     | 16,000                               | 1,000                         | 330           | 10,000  | 600                           | 480           | 7,000   | 400                           | 320           | 4,200   | 300                           | 180           | 3,200  | 75                            | 60            |
| 4                     | 12,000                               | 1,000                         | 330           | 7,500   | 600                           | 480           | 5,200   | 400                           | 320           | 3,100   | 300                           | 180           | 2,400  | 75                            | 60            |
| 5                     | 9,600                                | 1,000                         | 330           | 6,000   | 600                           | 480           | 4,200   | 400                           | 320           | 2,500   | 300                           | 180           | 1,900  | 75                            | 60            |
| 6                     | 8,000                                | 1,000                         | 330           | 5,000   | 600                           | 480           | 3,500   | 400                           | 320           | 2,100   | 300                           | 180           | 1,600  | 75                            | 60            |
| 8                     | 6,000                                | 1,000                         | 330           | 4,000   | 520                           | 410           | 2,800   | 350                           | 280           | 1,600   | 260                           | 150           | 1,200  | 65                            | 50            |
| 10                    | 4,800                                | 1,000                         | 330           | 3,200   | 450                           | 360           | 2,200   | 300                           | 240           | 1,300   | 230                           | 130           | 1,000  | 65                            | 50            |
| 12                    | 4,000                                | 1,000                         | 330           | 2,700   | 410                           | 320           | 1,900   | 270                           | 210           | 1,100   | 210                           | 120           | 800  | 65                            | 50            |
| 16                    | 3,000                                | 1,000                         | 330           | 2,000   | 240                           | 190           | 1,400   | 210                           | 160           | 840   | 160                           | 100           | 600  | 60                            | 45            |
| 20                    | 2,400                                | 1,000                         | 330           | 1,600   | 200                           | 160           | 1,100   | 170                           | 130           | 680   | 140                           | 80            | 480  | 50                            | 40            |
| 25                    | 1,900                                | 1,000                         | 330           | 1,300   | 160                           | 130           | 900   | 140                           | 110           | 540   | 120                           | 70            | 380  | 45                            | 35            |

Depth of cut (D:直徑Dia)  
切削量基準

1. Please use SI coating tools for work materials of 50~60HRC.
  2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
  3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
  4. When drilling, please set the feed rate at 1/3 or below of the above value.
1. 切削 50~60 HRC 以上之材料時，請使用 SI 鍍膜之刀具。
  2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
  3. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
  4. 縱向進給時，進給速度請設定為上表之 1/3 以下。

Unit/單位: mm

產品規格表 **P37-38**

Specification page

• P-SSE/P-MSE/P-SE 2 Flutes Slotting 溝銑切削

| WORK MATERIAL<br>被切削材   | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-------------------------|--------------------------------------|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                         |                                      |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| MILL DIA.<br>(mm)<br>直徑 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| 1                       | 47,500                               | 280                     | 17,500  | 96                      | 12,500  | 72                      | 11,000                               | 52                      |
| 1.5                     | 32,000                               | 256                     | 12,500  | 96                      | 8,900   | 72                      | 7,900                                | 52                      |
| 2                       | 24,000                               | 248                     | 9,700   | 104                     | 7,000   | 72                      | 6,300                                | 56                      |
| 2.5                     | 20,000                               | 280                     | 8,200   | 128                     | 6,100   | 72                      | 5,300                                | 56                      |
| 3                       | 16,000                               | 320                     | 6,900   | 136                     | 5,300   | 80                      | 4,400                                | 60                      |
| 3.5                     | 14,000                               | 336                     | 6,000   | 152                     | 4,600   | 96                      | 3,800                                | 64                      |
| 4                       | 12,000                               | 360                     | 5,400   | 168                     | 4,200   | 100                     | 3,500                                | 72                      |
| 4.5                     | 10,500                               | 400                     | 5,100   | 192                     | 3,900   | 104                     | 3,200                                | 76                      |
| 5                       | 9,500                                | 432                     | 4,800   | 216                     | 3,500   | 104                     | 3,000                                | 80                      |
| 5.5                     | 8,800                                | 432                     | 4,400   | 216                     | 3,200   | 104                     | 2,700                                | 80                      |
| 6                       | 7,900                                | 424                     | 4,000   | 216                     | 2,900   | 104                     | 2,500                                | 80                      |
| 6.5                     | 7,500                                | 424                     | 3,700   | 216                     | 2,700   | 104                     | 2,300                                | 80                      |
| 7                       | 6,900                                | 424                     | 3,400   | 216                     | 2,500   | 104                     | 2,100                                | 80                      |
| 7.5                     | 6,400                                | 424                     | 3,200   | 216                     | 2,300   | 104                     | 2,000                                | 80                      |
| 8                       | 5,900                                | 416                     | 3,000   | 208                     | 2,200   | 100                     | 1,900                                | 80                      |
| 8.5                     | 5,600                                | 416                     | 2,800   | 208                     | 2,000   | 100                     | 1,700                                | 80                      |
| 9                       | 5,300                                | 408                     | 2,600   | 208                     | 1,900   | 100                     | 1,500                                | 80                      |
| 9.5                     | 5,100                                | 408                     | 2,500   | 208                     | 1,800   | 100                     | 1,400                                | 76                      |
| 10                      | 4,700                                | 400                     | 2,400   | 200                     | 1,700   | 100                     | 1,500                                | 76                      |
| 11                      | 4,400                                | 400                     | 2,200   | 200                     | 1,600   | 100                     | 1,100                                | 76                      |
| 12                      | 4,000                                | 408                     | 2,000   | 200                     | 1,400   | 100                     | 1,200                                | 76                      |
| 16                      | 3,000                                | 320                     | 1,500   | 160                     | 1,100   | 92                      | 800                                  | 64                      |
| 18                      | 2,700                                | 288                     | 1,300   | 144                     | 900   | 80                      | 700                                  | 56                      |
| 20                      | 2,400                                | 240                     | 1,200   | 120                     | 800   | 72                      | 600                                  | 48                      |

|                      |  |  |
|----------------------|--|--|
| DEPTH OF CUT<br>加工深度 |  |  |
|----------------------|--|--|

P-SSE/P-MSE/P-SE

P-MPE/P-PE(45°)

產品規格表 **P39-40**

產品規格表 **P43-44**

Specification page

Specification page

## • P-SSE/P-MSE/P-SE/P-MPE/P-PE(45°) 4T Side Milling 側銑切削

| WORK MATERIAL<br>被切削材 | MILD STEELS,<br>CARBON STEELS,<br>CAST IRON<br>SS400、S55C、<br>FC250(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                      | ALLOY STEELS, TOOL<br>STEELS<br>SCM、SKT、SKS、<br>SKD<br>~HRC30合金鋼、<br>工具鋼 |                                      | HARDENED STEELS,<br>PREHARDENED<br>STEELS<br>SKT、SKD、NAK55、<br>HPM1<br>HRC30~38<br>調質鋼、預硬鋼 |                                      | STAINLESS STEELS,<br>HARDENED STEELS<br>SUS304、SKD<br>HRC38~45不鏽鋼、<br>調質鋼 |                                      | HARDENED STEELS,<br>TITANIUM ALLOY<br>STEELS<br>HRC45~55<br>調質鋼、鈦合金 |                                      | HEAT RESISTANT<br>ALLOY STEELS<br>INCONEL<br>耐熱合金鋼、<br>高鎳合金 |                                      |
|-----------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|---|--------------------------------------|---|--------------------------------------|---|--------------------------------------|
|                       | MILL DIA.<br>(mm)<br>直徑  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速                                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 |
| 3                     | 12,500   | 880                                  | 9,550  | 672                                  | 8,100  | 500                                  | 7,650   | 492                                  | 7,400   | 436                                  | 3,800   | 176                                  |
| 4                     | 9,750  | 960                                  | 7,550  | 788                                  | 6,400  | 544                                  | 6,050   | 568                                  | 5,850   | 504                                  | 3,000   | 192                                  |
| 5                     | 7,950  | 1,040                                | 6,150  | 840                                  | 5,250  | 580                                  | 4,950   | 620                                  | 4,800   | 536                                  | 2,450   | 196                                  |
| 6                     | 6,750  | 1,280                                | 5,250  | 960                                  | 4,450  | 712                                  | 4,200   | 668                                  | 4,050   | 556                                  | 2,100   | 200                                  |
| 8                     | 5,050  | 1,240                                | 3,950  | 880                                  | 3,350  | 652                                  | 3,150   | 648                                  | 3,050   | 540                                  | 1,600   | 180                                  |
| 10                    | 4,100  | 1,160                                | 3,200  | 840                                  | 2,700  | 580                                  | 2,550   | 572                                  | 2,450   | 508                                  | 1,250   | 172                                  |
| 12                    | 3,400  | 1,120                                | 2,650  | 800                                  | 2,250  | 576                                  | 2,100   | 540                                  | 2,050   | 484                                  | 1,050   | 168                                  |
| 16                    | 2,550  | 960                                  | 2,000  | 752                                  | 1,700  | 508                                  | 1,600   | 444                                  | 1,550   | 404                                  | 765   | 168                                  |
| 20                    | 2,050  | 788                                  | 1,600  | 604                                  | 1,350  | 472                                  | 1,250   | 412                                  | 1,250   | 368                                  | 635   | 160                                  |
| 25                    | 1,650  | 704                                  | 1,250  | 540                                  | 1,100  | 428                                  | 1,000   | 388                                  | 990   | 316                                  | 510   | 148                                  |

DEPTH OF CUT  
加工深度

## • P-SSE/P-MSE/P-SE/P-MPE/P-PE(45°) 4T Slotting 溝銑切削

| WORK MATERIAL<br>被切削材 | MILD STEELS,<br>CARBON STEELS,<br>CAST IRON<br>SS400、S55C、<br>FC250(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                      | ALLOY STEELS, TOOL<br>STEELS<br>SCM、SKT、SKS、<br>SKD<br>~HRC30合金鋼、工具鋼 |                                      | HARDENED STEELS,<br>PREHARDENED<br>STEELS<br>SKT、SKD、NAK55、<br>HPM1<br>HRC30~38<br>調質鋼、預硬鋼 |                                      | STAINLESS STEELS,<br>HARDENED STEELS<br>SUS304、SKD<br>HRC38~45不鏽鋼、<br>調質鋼 |                                      | HARDENED STEELS,<br>TITANIUM ALLOY<br>STEELS<br>HRC45~55<br>調質鋼、鈦合金 |                                      | HEAT RESISTANT<br>ALLOY STEELS<br>INCONEL<br>耐熱合金鋼、<br>高鎳合金 |                                      |
|-----------------------|--|--------------------------------------|--|--------------------------------------|--|--------------------------------------|---|--------------------------------------|---|--------------------------------------|---|--------------------------------------|
|                       | MILL DIA.<br>(mm)<br>直徑  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速                                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 |
| 3                     | 10,500   | 584                                  | 8,550  | 544                                  | 7,850  | 416                                  | 7,450   | 368                                  | 7,200   | 352                                  | 2,500   | 100                                  |
| 4                     | 7,750  | 584                                  | 6,400  | 620                                  | 5,900  | 416                                  | 5,550   | 412                                  | 5,400   | 396                                  | 1,900   | 108                                  |
| 5                     | 6,200  | 588                                  | 5,100  | 604                                  | 4,700  | 436                                  | 4,450   | 436                                  | 4,300   | 428                                  | 1,500   | 116                                  |
| 6                     | 5,150  | 592                                  | 4,250  | 508                                  | 3,950  | 460                                  | 3,700   | 456                                  | 3,600   | 436                                  | 1,250   | 116                                  |
| 8                     | 3,850  | 480                                  | 3,200  | 440                                  | 2,950  | 440                                  | 2,800   | 420                                  | 2,700   | 408                                  | 945   | 124                                  |
| 10                    | 3,100  | 464                                  | 2,550  | 432                                  | 2,350  | 384                                  | 2,250   | 380                                  | 2,150   | 364                                  | 760   | 116                                  |
| 12                    | 2,600  | 448                                  | 2,150  | 380                                  | 1,950  | 368                                  | 1,850   | 352                                  | 1,800   | 348                                  | 630   | 116                                  |
| 16                    | 1,950  | 444                                  | 1,600  | 344                                  | 1,500  | 296                                  | 1,400   | 296                                  | 1,350   | 292                                  | 475   | 88                                   |
| 20                    | 1,550  | 380                                  | 1,300  | 304                                  | 1,200  | 284                                  | 1,100   | 264                                  | 1,100   | 264                                  | 380   | 88                                   |
| 25                    | 1,250  | 360                                  | 1,000  | 292                                  | 945  | 252                                  | 890   | 228                                  | 865   | 188                                  | 300   | 84                                   |

DEPTH OF CUT  
加工深度



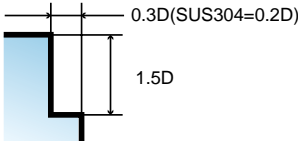
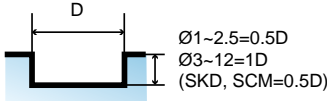
產品規格表 **P41-42**

Specification page

## • P-MPE/P-PE (45°) 3 Flutes Slotting Milling 溝銑切削

| WORK MATERIAL<br>被切削材   | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-------------------------|--------------------------------------|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                         |                                      |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| 直徑<br>MILL DIA.<br>(mm) | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| 1                       | 47,500                               | 420                     | 17,500  | 144                     | 12,500  | 108                     | 11,000                               | 78                      |
| 1.5                     | 32,000                               | 384                     | 12,500  | 144                     | 8,900   | 108                     | 7,900                                | 78                      |
| 2                       | 24,000                               | 372                     | 9,700   | 156                     | 7,000   | 108                     | 6,300                                | 84                      |
| 2.5                     | 20,000                               | 420                     | 8,200   | 192                     | 6,100   | 108                     | 5,300                                | 84                      |
| 3                       | 16,000                               | 480                     | 6,900   | 204                     | 5,300   | 120                     | 4,400                                | 90                      |
| 3.5                     | 14,000                               | 504                     | 6,000   | 228                     | 4,600   | 144                     | 3,800                                | 96                      |
| 4                       | 12,000                               | 540                     | 5,400   | 252                     | 4,200   | 150                     | 3,500                                | 108                     |
| 4.5                     | 10,500                               | 600                     | 5,100   | 288                     | 3,900   | 156                     | 3,200                                | 114                     |
| 5                       | 9,500                                | 648                     | 4,800   | 324                     | 3,500   | 156                     | 3,000                                | 120                     |
| 5.5                     | 8,800                                | 648                     | 4,400   | 324                     | 3,200   | 156                     | 2,700                                | 120                     |
| 6                       | 7,900                                | 636                     | 4,000   | 324                     | 2,900   | 156                     | 2,500                                | 120                     |
| 6.5                     | 7,500                                | 636                     | 3,700   | 324                     | 2,700   | 156                     | 2,300                                | 120                     |
| 7                       | 6,900                                | 636                     | 3,400   | 324                     | 2,500   | 156                     | 2,100                                | 120                     |
| 7.5                     | 6,400                                | 636                     | 3,200   | 324                     | 2,300   | 156                     | 2,000                                | 120                     |
| 8                       | 5,900                                | 624                     | 3,000   | 312                     | 2,200   | 150                     | 1,900                                | 120                     |
| 8.5                     | 5,600                                | 624                     | 2,800   | 312                     | 2,000   | 150                     | 1,700                                | 120                     |
| 9                       | 5,300                                | 612                     | 2,600   | 312                     | 1,900   | 150                     | 1,500                                | 120                     |
| 9.5                     | 5,100                                | 612                     | 2,500   | 312                     | 1,800   | 150                     | 1,400                                | 114                     |
| 10                      | 4,700                                | 600                     | 2,400   | 300                     | 1,700   | 150                     | 1,500                                | 114                     |
| 11                      | 4,400                                | 600                     | 2,200   | 300                     | 1,600   | 150                     | 1,100                                | 114                     |
| 12                      | 4,000                                | 612                     | 2,000   | 300                     | 1,400   | 150                     | 1,200                                | 114                     |
| 16                      | 3,000                                | 480                     | 1,500   | 240                     | 1,100   | 138                     | 800                                  | 96                      |
| 18                      | 2,700                                | 432                     | 1,300   | 216                     | 900   | 120                     | 700                                  | 84                      |
| 20                      | 2,400                                | 360                     | 1,200   | 180                     | 800   | 108                     | 600                                  | 72                      |

|                      |   |  |
|----------------------|---|--|
| DEPTH OF CUT<br>加工深度 |  <p>0.3D(SUS304=0.2D)<br/>1.5D</p> |  <p>D<br/>Ø1~2.5=0.5D<br/>Ø3~12=1D (SKD, SCM=0.5D)</p> |
|----------------------|---|--|

P-SLE/P-MLE

SUPE

SUS

產品規格表 **P46**  
Specification page

產品規格表 **P198**  
Specification page

產品規格表 **P247**  
Specification page

### ● P-SLE,P-MLE,SUPE,SUS 4 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼, 合金鋼~HRC30 |                            |               | Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened Steels, AISI H13<br>合金鋼, 工具鋼HRC30~45 |                            |               | Austenitic stainless Steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                            |               | Hardened Steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                            |               |
|-----------------------|--|----------------------------|---------------|---|----------------------------|---------------|---|----------------------------|---------------|---|----------------------------|---------------|
| Cutting Speed<br>切削速度 | 50~100m/min  |                            |               | 50~70m/min  |                            |               | 30~60m/min  |                            |               | 30~50m/min  |                            |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數                                      | Feed Rate (mm/min)<br>進給速度 |               |
|                       |  | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |
| 1                     | 30,000   | 900                        | 720           | 20,000  | 600                        | 480           | 12,600  | 450                        | 270           | 15,000  | 180                        | 140           |
| 1.5                   | 20,000   | 900                        | 720           | 14,000  | 600                        | 480           | 8,400   | 450                        | 270           | 10,000  | 180                        | 140           |
| 2                     | 15,000   | 900                        | 720           | 10,000  | 600                        | 480           | 6,300   | 450                        | 270           | 8,000   | 180                        | 140           |
| 2.5                   | 12,000   | 900                        | 720           | 8,200   | 600                        | 480           | 5,100   | 450                        | 270           | 6,100   | 180                        | 140           |
| 3                     | 10,000   | 900                        | 720           | 7,000   | 600                        | 480           | 4,200   | 450                        | 270           | 5,000   | 180                        | 140           |
| 4                     | 7,500  | 900                        | 720           | 5,200   | 600                        | 480           | 3,100   | 450                        | 270           | 4,000   | 180                        | 140           |
| 5                     | 6,000  | 900                        | 720           | 4,200   | 600                        | 480           | 2,500   | 450                        | 270           | 3,200   | 180                        | 140           |
| 6                     | 5,000  | 900                        | 720           | 3,500   | 600                        | 480           | 2,100   | 450                        | 270           | 2,700   | 180                        | 140           |
| 8                     | 4,000  | 780                        | 620           | 2,800   | 520                        | 410           | 1,600   | 390                        | 230           | 2,000   | 160                        | 125           |
| 10                    | 3,200  | 680                        | 540           | 2,200   | 450                        | 360           | 1,300   | 340                        | 200           | 1,600   | 140                        | 110           |
| 12                    | 2,700  | 620                        | 490           | 1,900   | 410                        | 320           | 1,100   | 310                        | 180           | 1,300   | 120                        | 95            |
| 16                    | 2,000  | 360                        | 280           | 1,400   | 310                        | 240           | 840   | 240                        | 140           | 1,000   | 100                        | 80            |
| 20                    | 1,600  | 300                        | 240           | 1,100   | 250                        | 200           | 680   | 210                        | 120           | 800   | 90                         | 70            |
| 25                    | 1,300  | 240                        | 190           | 900   | 210                        | 160           | 540   | 180                        | 100           | 640   | 70                         | 55            |

Depth of cut (D:直徑Dia) 切削量基準

1. Please use SI coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

1. 切削 50~60 HRC 以上之材料時，請使用 SI 鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
3. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之 1/3 以下。

P-SLE/P-MLE

SUPE

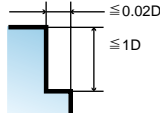
SUS

產品規格表 **P46**  
Specification page

產品規格表 **P198**  
Specification page

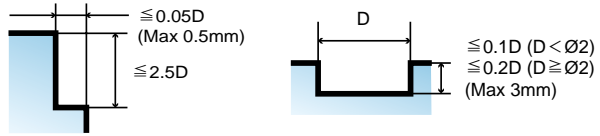
產品規格表 **P247**  
Specification page

### ● P-SLE,P-MLE,SUPE,SUS 4 Flutes High-Speed Milling Conditions 高速標準切削

| Work Material<br>被削材               | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼, 合金鋼 ~HRC30 |                            | Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼, 工具鋼HRC30~45 |                            | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                            |
|------------------------------------|---|----------------------------|---|----------------------------|---|----------------------------|
| Cutting Speed<br>切削速度              | 300m/min  |                            | 200m/min  |                            | 100m/min  |                            |
| Diameter<br>直徑(mm)                 | Speed (min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |
| 1                                  | 40,000  | 1,200                      | 30,000  | 900                        | 30,000  | 360                        |
| 2                                  | 40,000  | 2,400                      | 30,000  | 1,800                      | 23,800  | 530                        |
| 3                                  | 30,000  | 2,700                      | 21,200  | 1,800                      | 15,900  | 530                        |
| 4                                  | 23,800  | 2,850                      | 15,900  | 1,800                      | 11,900  | 530                        |
| 5                                  | 19,000  | 2,850                      | 12,700  | 1,800                      | 9,500   | 530                        |
| 6                                  | 15,900  | 2,850                      | 10,600  | 1,800                      | 7,900   | 530                        |
| 8                                  | 11,900  | 2,325                      | 7,900   | 1,485                      | 5,900   | 470                        |
| 10                                 | 9,500   | 2,000                      | 6,300   | 1,290                      | 4,700   | 410                        |
| 12                                 | 7,900   | 1,800                      | 5,300   | 1,125                      | 3,900   | 360                        |
| 16                                 | 6,000   | 1,000                      | 4,000   | 880                        | 3,000   | 300                        |
| 20                                 | 4,800   | 900                        | 3,200   | 720                        | 2,400   | 270                        |
| 25                                 | 3,800   | 700                        | 2,500   | 580                        | 1,900   | 200                        |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 |            |                            |   |                            |   |                            |

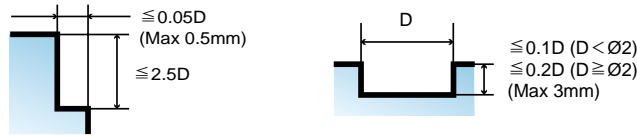
產品規格表 **P47**  
Specification page

## • P-LET 2 Flutes Side MILLING P-LET 2刃側銑

| WORK MATERIAL<br>被切削材   | COPPER, ALUMINUM ALLOY<br>銅、鋁合金  |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-------------------------|--|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                         |  |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| MILL DIA.<br>(mm)<br>直徑 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| 1                       | 9,800  | 96                      | 5,700   | 36                      | 5,400   | 40                      | -                                    | -                       |
| 1.5                     | 7,000  | 104                     | 3,900   | 36                      | 3,600   | 40                      | -                                    | -                       |
| 2                       | 5,200  | 96                      | 3,000   | 36                      | 2,800   | 40                      | -                                    | -                       |
| 2.5                     | 4,100  | 112                     | 2,500   | 44                      | 2,500   | 40                      | -                                    | -                       |
| 3                       | 3,400  | 120                     | 2,100   | 48                      | 2,100   | 40                      | 1,900                                | 24                      |
| 3.5                     | 2,800  | 128                     | 1,800   | 56                      | 1,800   | 44                      | 1,600                                | 24                      |
| 4                       | 2,400  | 136                     | 1,600   | 60                      | 1,600   | 52                      | 1,400                                | 28                      |
| 4.5                     | 2,100  | 160                     | 1,500   | 68                      | 1,500   | 52                      | 1,300                                | 32                      |
| 5                       | 2,000  | 168                     | 1,400   | 76                      | 1,400   | 52                      | 1,300                                | 32                      |
| 5.5                     | 1,800  | 168                     | 1,300   | 76                      | 1,300   | 52                      | 1,100                                | 32                      |
| 6                       | 1,600  | 168                     | 1,200   | 76                      | 1,200   | 52                      | 1,000                                | 32                      |
| 8                       | 1,100  | 160                     | 900   | 76                      | 900   | 52                      | 800                                  | 32                      |
| 10                      | 900  | 160                     | 700   | 72                      | 700   | 52                      | 630                                  | 32                      |
| 12                      | 800  | 160                     | 600   | 72                      | 600   | 52                      | 525                                  | 32                      |
| DEPTH OF CUT<br>加工深度    |  |                         |   |                         |   |                         |                                      |                         |

產品規格表 **P48**  
Specification page


## • P-LET 4 Flutes Side Milling P-LET 4刃 側銑

| WORK MATERIAL<br>被切削材   | COPPER, ALUMINUM ALLOY<br>銅、鋁合金  |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS,<br>STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |
|-------------------------|--|-------------------------|---|-------------------------|--|-------------------------|--------------------------------------|
|                         |  |                         | ~32HRC  |                         | HRC33~41   |                         | HRC42~50                             |
| MILL DIA.<br>(mm)<br>直徑 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 |
| 1                       | 5,880  | 96                      | 3,420   | 36                      | 3,240  | 40                      | -                                    |
| 1.5                     | 4,200  | 104                     | 2,340   | 36                      | 2,160  | 40                      | -                                    |
| 2                       | 3,120  | 96                      | 1,800   | 36                      | 1,680  | 40                      | -                                    |
| 2.5                     | 2,460  | 112                     | 1,500   | 44                      | 1,500  | 40                      | -                                    |
| 3                       | 2,040  | 120                     | 1,260   | 48                      | 1,260  | 40                      | 1,140                                |
| 3.5                     | 1,680  | 128                     | 1,080   | 56                      | 1,080  | 44                      | 960                                  |
| 4                       | 1,440  | 136                     | 960   | 60                      | 960  | 52                      | 840                                  |
| 4.5                     | 1,260  | 160                     | 900   | 68                      | 900  | 52                      | 780                                  |
| 5                       | 1,200  | 168                     | 840   | 76                      | 840  | 52                      | 780                                  |
| 5.5                     | 1,080  | 168                     | 780   | 76                      | 780  | 52                      | 660                                  |
| 6                       | 960  | 168                     | 720   | 76                      | 720  | 52                      | 600                                  |
| 8                       | 660  | 160                     | 540   | 76                      | 540  | 52                      | 480                                  |
| 10                      | 540  | 160                     | 420   | 72                      | 420  | 52                      | 378                                  |
| 12                      | 480  | 160                     | 360   | 72                      | 360  | 52                      | 315                                  |
| DEPTH OF CUT<br>加工深度    |  |                         |   |                         |  |                         |                                      |

產品規格表 **P49-51**  
Specification page

| ● P-LNT 2 Flutes Slotting P-LNT 2刃 溝銑切削 |                         |                                      |                         |        |  |                         |       |   |                         |       |                                      |                         |       |
|---|-------------------------|--------------------------------------|-------------------------|--------|--|-------------------------|-------|---|-------------------------|-------|--------------------------------------|-------------------------|-------|
| WORK MATERIAL<br>被切削材                   |                         | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         |        | MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         |       | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELSSKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |       |                                      |                         |       |
| MILL DIA.<br>(mm)<br>直徑                 | Efficient Length<br>有效長 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | Ap     | ~32HRC   |                         |       | HRC33~41  |                         |       | HRC42~50                             |                         |       |
|   |                         |                                      |                         |        | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                             | FEED<br>(mm/min)<br>進給速 | Ap    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | Ap    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | Ap    |
| 0.5                                     | 2                       | 38,500                               | 480                     | 0.054  | 32,000   | 400                     | 0.045 | 32,000  | 320                     | 0.038 | 29,000                               | 240                     | 0.030 |
|   | 4                       | 33,500                               | 384                     | 0.025  | 28,000   | 320                     | 0.021 | 28,000  | 256                     | 0.018 | 25,000                               | 200                     | 0.014 |
|   | 6                       | 26,500                               | 336                     | 0.007  | 22,000   | 280                     | 0.006 | 22,000  | 176                     | 0.005 | 20,000                               | 144                     | 0.004 |
| 0.6                                     | 2                       | 38,500                               | 576                     | 0.065  | 32,000   | 480                     | 0.054 | 32,000  | 320                     | 0.045 | 27,000                               | 240                     | 0.036 |
|   | 4                       | 33,500                               | 432                     | 0.048  | 28,000   | 360                     | 0.040 | 28,000  | 240                     | 0.033 | 25,000                               | 160                     | 0.260 |
|   | 6                       | 26,500                               | 240                     | 0.022  | 22,000   | 200                     | 0.018 | 22,000  | 160                     | 0.015 | 20,000                               | 120                     | 0.012 |
| 0.7                                     | 4                       | 33,500                               | 432                     | 0.055  | 28,000   | 360                     | 0.046 | 28,000  | 240                     | 0.039 | 22,000                               | 240                     | 0.031 |
|   | 6                       | 33,500                               | 432                     | 0.035  | 28,000   | 360                     | 0.029 | 28,000  | 160                     | 0.250 | 22,000                               | 160                     | 0.020 |
| 0.8                                     | 4                       | 38,500                               | 576                     | 0.064  | 32,000   | 480                     | 0.053 | 32,000  | 480                     | 0.044 | 25,000                               | 320                     | 0.035 |
|   | 6                       | 31,000                               | 432                     | 0.041  | 26,000   | 360                     | 0.034 | 26,000  | 320                     | 0.028 | 21,000                               | 240                     | 0.022 |
|   | 8                       | 26,500                               | 336                     | 0.290  | 22,000   | 280                     | 0.024 | 22,000  | 240                     | 0.020 | 18,000                               | 200                     | 0.016 |
| 0.9                                     | 6                       | 36,000                               | 960                     | 0.071  | 30,000   | 800                     | 0.059 | 28,000  | 624                     | 0.050 | 22,000                               | 480                     | 0.040 |
|   | 8                       | 31,000                               | 768                     | 0.046  | 26,000   | 640                     | 0.038 | 25,000  | 480                     | 0.032 | 19,000                               | 320                     | 0.025 |
|   | 10                      | 24,000                               | 576                     | 0.032  | 20,000   | 480                     | 0.027 | 20,000  | 400                     | 0.023 | 16,000                               | 240                     | 0.018 |
| 1.0                                     | 6                       | 32,500                               | 960                     | 0.084  | 27,000   | 800                     | 0.070 | 26,000  | 720                     | 0.060 | 20,000                               | 480                     | 0.040 |
|   | 8                       | 27,500                               | 768                     | 0.048  | 23,000   | 640                     | 0.040 | 22,000  | 560                     | 0.040 | 18,000                               | 320                     | 0.030 |
|   | 10                      | 23,000                               | 576                     | 0.036  | 19,000   | 480                     | 0.030 | 18,000  | 400                     | 0.028 | 15,000                               | 240                     | 0.020 |
|   | 12                      | 23,000                               | 576                     | 0.024  | 19,000   | 480                     | 0.020 | 18,000  | 400                     | 0.019 | 15,000                               | 240                     | 0.010 |
| 1.2                                     | 16                      | 18,000                               | 288                     | 0.010  | 15,000   | 240                     | 0.008 | 15,000  | 240                     | 0.007 | 12,000                               | 160                     | 0.006 |
|   | 6                       | 27,500                               | 960                     | 0.096  | 23,000   | 800                     | 0.080 | 22,000  | 720                     | 0.070 | 18,000                               | 560                     | 0.060 |
|   | 8                       | 24,000                               | 672                     | 0.084  | 20,000   | 560                     | 0.070 | 19,000  | 560                     | 0.050 | 17,000                               | 480                     | 0.050 |
|   | 10                      | 24,000                               | 672                     | 0.060  | 20,000   | 560                     | 0.050 | 19,000  | 560                     | 0.040 | 14,000                               | 320                     | 0.040 |
| 1.4                                     | 12                      | 20,500                               | 576                     | 0.048  | 17,000   | 480                     | 0.040 | 16,000  | 400                     | 0.030 | 14,000                               | 320                     | 0.030 |
|   | 6                       | 24,000                               | 960                     | 0.156  | 20,000   | 800                     | 0.013 | 19,000  | 720                     | 0.110 | 15,000                               | 480                     | 0.090 |
|   | 10                      | 21,500                               | 768                     | 0.072  | 18,000   | 640                     | 0.050 | 17,000  | 560                     | 0.040 | 13,000                               | 320                     | 0.030 |
|   | 16                      | 18,000                               | 576                     | 0.036  | 15,000   | 480                     | 0.030 | 14,000  | 400                     | 0.020 | 11,000                               | 240                     | 0.020 |
| 1.5                                     | 6                       | 21,500                               | 960                     | 0.168  | 18,000   | 800                     | 0.014 | 18,000  | 720                     | 0.110 | 14,000                               | 480                     | 0.090 |
|   | 8                       | 19,000                               | 768                     | 0.120  | 16,000   | 640                     | 0.010 | 15,000  | 560                     | 0.080 | 12,000                               | 320                     | 0.070 |
|   | 10                      | 19,000                               | 768                     | 0.096  | 16,000   | 640                     | 0.080 | 15,000  | 560                     | 0.070 | 12,000                               | 320                     | 0.050 |
|   | 12                      | 19,000                               | 768                     | 0.072  | 16,000   | 640                     | 0.060 | 15,000  | 560                     | 0.050 | 12,000                               | 320                     | 0.040 |
|   | 14                      | 19,000                               | 768                     | 0.060  | 16,000   | 640                     | 0.050 | 15,000  | 560                     | 0.045 | 12,000                               | 320                     | 0.035 |
|   | 16                      | 17,000                               | 576                     | 0.060  | 14,000   | 480                     | 0.050 | 13,000  | 400                     | 0.040 | 10,000                               | 240                     | 0.030 |
|   | 18                      | 17,000                               | 576                     | 0.036  | 14,000   | 480                     | 0.030 | 13,000  | 400                     | 0.020 | 10,000                               | 240                     | 0.020 |
| 1.6                                     | 20                      | 14,500                               | 400                     | 0.024  | 12,000   | 336                     | 0.020 | 11,000  | 304                     | 0.015 | 10,000                               | 240                     | 0.010 |
|   | 6                       | 20,500                               | 960                     | 0.180  | 17,000   | 800                     | 0.150 | 17,000  | 720                     | 0.130 | 13,000                               | 480                     | 0.100 |
|   | 8                       | 18,000                               | 768                     | 0.168  | 15,000   | 640                     | 0.140 | 15,000  | 560                     | 0.120 | 11,000                               | 320                     | 0.100 |
|   | 10                      | 18,000                               | 768                     | 0.132  | 15,000   | 640                     | 0.110 | 15,000  | 560                     | 0.090 | 11,000                               | 320                     | 0.070 |
|   | 12                      | 18,000                               | 768                     | 0.084  | 15,000   | 640                     | 0.070 | 15,000  | 560                     | 0.060 | 11,000                               | 320                     | 0.050 |
|   | 14                      | 18,000                               | 768                     | 0.072  | 15,000   | 640                     | 0.060 | 15,000  | 560                     | 0.050 | 11,000                               | 320                     | 0.040 |
|   | 16                      | 15,500                               | 576                     | 0.060  | 13,000   | 480                     | 0.050 | 13,000  | 400                     | 0.040 | 9,000                                | 240                     | 0.035 |
| 1.8                                     | 18                      | 15,500                               | 576                     | 0.048  | 13,000   | 480                     | 0.040 | 13,000  | 400                     | 0.030 | 9,000                                | 240                     | 0.030 |
|   | 8                       | 19,000                               | 1,040                   | 0.252  | 16,000   | 880                     | 0.210 | 15,000  | 800                     | 0.170 | 12,000                               | 560                     | 0.130 |
|   | 14                      | 17,000                               | 768                     | 0.096  | 14,000   | 640                     | 0.080 | 14,000  | 560                     | 0.060 | 10,000                               | 400                     | 0.050 |
|   | 20                      | 14,500                               | 576                     | 0.048  | 12,000   | 480                     | 0.040 | 12,000  | 400                     | 0.040 | 8,000                                | 320                     | 0.030 |
|   | 6                       | 18,000                               | 1,040                   | 0.372  | 15,000   | 880                     | 0.310 | 14,000  | 800                     | 0.260 | 11,000                               | 560                     | 0.210 |
| 2.0                                     | 8                       | 18,000                               | 1,040                   | 0.312  | 15,000   | 880                     | 0.260 | 14,000  | 800                     | 0.220 | 11,000                               | 560                     | 0.180 |
|   | 10                      | 15,500                               | 768                     | 0.288  | 13,000   | 640                     | 0.240 | 12,000  | 560                     | 0.200 | 9,000                                | 400                     | 0.160 |
|   | 12                      | 15,500                               | 768                     | 0.156  | 13,000   | 640                     | 0.130 | 12,000  | 560                     | 0.110 | 9,000                                | 400                     | 0.090 |
|   | 14                      | 15,500                               | 768                     | 0.132  | 13,000   | 640                     | 0.110 | 12,000  | 560                     | 0.090 | 9,000                                | 400                     | 0.070 |
|   | 16                      | 15,500                               | 768                     | 0.096  | 13,000   | 640                     | 0.080 | 12,000  | 560                     | 0.070 | 9,000                                | 400                     | 0.060 |
|   | 18                      | 15,500                               | 768                     | 0.084  | 13,000   | 640                     | 0.070 | 12,000  | 560                     | 0.060 | 9,000                                | 400                     | 0.050 |
|   | 20                      | 13,000                               | 576                     | 0.060  | 11,000   | 480                     | 0.050 | 10,000  | 400                     | 0.050 | 7,000                                | 320                     | 0.040 |
| 2.5                                     | 8                       | 14,500                               | 1,040                   | 0.468  | 12,000   | 880                     | 0.039 | 11,000  | 800                     | 0.330 | 9,000                                | 560                     | 0.260 |
|   | 10                      | 14,500                               | 1,040                   | 0.396  | 12,000   | 880                     | 0.033 | 11,000  | 800                     | 0.280 | 9,000                                | 560                     | 0.220 |
|   | 12                      | 14,500                               | 1,040                   | 0.276  | 12,000   | 880                     | 0.230 | 11,000  | 800                     | 0.190 | 9,000                                | 560                     | 0.150 |
|   | 14                      | 12,000                               | 768                     | 0.204  | 12,000   | 640                     | 0.170 | 9,000   | 560                     | 0.140 | 7,000                                | 400                     | 0.110 |
|   | 16                      | 12,000                               | 768                     | 0.144  | 12,000   | 640                     | 0.120 | 9,000   | 560                     | 0.100 | 7,000                                | 400                     | 0.080 |
| 20                                      | 12,000                  | 768                                  | 0.108                   | 12,000 | 640  | 0.090                   | 9,000 | 560   | 0.090                   | 7,000 | 400                                  | 0.060                   |       |

產品規格表 **P49-51**  
Specification page

| ● P-LNT 2 Flutes Slotting P-LNT 2刃 溝銑切削 |                         |  |                         |       |  |                         |       |   |                         |       |                                      |                         |       |
|---|-------------------------|--|-------------------------|-------|--|-------------------------|-------|---|-------------------------|-------|--------------------------------------|-------------------------|-------|
| WORK MATERIAL<br>被切削材                   |                         | COPPER, ALUMINUM ALLOY<br>銅、鋁合金  |                         |       | MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         |       | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELSSKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |       |                                      |                         |       |
|   |                         |  |                         |       | ~32HRC   |                         |       | HRC33~41  |                         |       | HRC42~50                             |                         |       |
| MILL DIA.<br>(mm)<br>直徑                 | Efficient Length<br>有效長 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | FEED<br>(mm/min)<br>進給速 | Ap    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                             | FEED<br>(mm/min)<br>進給速 | Ap    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | Ap    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | Ap    |
| 3.0                                     | 8                       | 12,000   | 1,040                   | 0.432 | 10,000   | 880                     | 0.360 | 10,000  | 800                     | 0.300 | 8,000                                | 560                     | 0.240 |
|   | 10                      | 12,000   | 1,040                   | 0.348 | 10,000   | 880                     | 0.290 | 10,000  | 800                     | 0.240 | 8,000                                | 560                     | 0.190 |
|   | 12                      | 12,000   | 1,040                   | 0.324 | 10,000   | 880                     | 0.270 | 10,000  | 800                     | 0.230 | 8,000                                | 560                     | 0.180 |
|   | 16                      | 12,000   | 768                     | 0.240 | 10,000   | 640                     | 0.200 | 9,000   | 560                     | 0.170 | 6,000                                | 400                     | 0.130 |
|   | 20                      | 12,000   | 768                     | 0.156 | 10,000   | 640                     | 0.130 | 9,000   | 560                     | 0.110 | 6,000                                | 400                     | 0.080 |
|   | 25                      | 12,000   | 768                     | 0.132 | 10,000   | 640                     | 0.110 | 9,000   | 560                     | 0.090 | 6,000                                | 400                     | 0.070 |
| 4.0                                     | 12                      | 8,550  | 1,080                   | 0.456 | 7,000  | 880                     | 0.380 | 7,000   | 800                     | 0.320 | 6,000                                | 560                     | 0.260 |
|   | 16                      | 8,550  | 1,080                   | 0.432 | 7,000  | 880                     | 0.360 | 7,000   | 800                     | 0.300 | 6,000                                | 560                     | 0.240 |
|   | 20                      | 8,550  | 776                     | 0.408 | 7,000  | 640                     | 0.340 | 6,000   | 560                     | 0.280 | 5,000                                | 400                     | 0.220 |
|   | 25                      | 8,550  | 776                     | 0.312 | 7,000  | 640                     | 0.260 | 6,000   | 560                     | 0.220 | 5,000                                | 400                     | 0.180 |
|   | 30                      | 8,550  | 776                     | 0.228 | 7,000  | 640                     | 0.190 | 6,000   | 560                     | 0.160 | 5,000                                | 400                     | 0.130 |
|   | 35                      | 8,550  | 776                     | 0.204 | 7,000  | 640                     | 0.170 | 6,000   | 560                     | 0.140 | 5,000                                | 400                     | 0.110 |
| DEPTH OF CUT<br>加工深度                    |                         |  |                         |       |  |                         |       |   |                         |       |                                      |                         |       |

P-NTA

產品規格表 **P52**  
Specification page

SUNTA

產品規格表 **P204**  
Specification page

## ● P-NTA,SUNTA 3 Flutes Side Cutting 側面切削

| Work Material<br>被削材 | SS400, AISI 1050, SCM<br>鑄鐵, FC250等<br>結構鋼, 碳素鋼 ~HRC30 |                               | AISI H13, AISI D2等<br>合金鋼, 工具鋼,<br>調質鋼HRC30~35 |                               | AISI 304, AISI 316等<br>沃斯田鐵系列不鏽鋼     |                               | SKD61等<br>淬火鋼HRC45~50                |                               | 耐熱合金英高鎳等                             |                               |
|----------------------|--|-------------------------------|--|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| (mm)<br>外徑           | Speed<br>(min <sup>-1</sup> )<br>迴轉數                   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數           | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| 5                    | 7600   | 555                           | 4500   | 285                           | 3800                                 | 195                           | 3200                                 | 75                            | 2500                                 | 53                            |
| 6                    | 6400   | 563                           | 3700   | 293                           | 3200                                 | 218                           | 2700                                 | 83                            | 2100                                 | 56                            |
| 8                    | 4800   | 585                           | 2800   | 315                           | 2400                                 | 255                           | 2000                                 | 105                           | 1600                                 | 71                            |
| 10                   | 3800   | 593                           | 2200   | 315                           | 1900                                 | 255                           | 1600                                 | 113                           | 1300                                 | 79                            |
| 12                   | 3200   | 593                           | 1900   | 315                           | 1600                                 | 240                           | 1300                                 | 113                           | 1100                                 | 83                            |
| 16                   | 2400   | 578                           | 1400   | 293                           | 1200                                 | 225                           | 1000                                 | 113                           | 800                                  | 83                            |
| 20                   | 1900   | 570                           | 1100   | 278                           | 1000                                 | 225                           | 800                                  | 105                           | 600                                  | 75                            |
| Depth of cut<br>切削深度 |  |                               |  |                               |                                      |                               |                                      |                               |                                      |                               |

P-NTA

產品規格表 **P52**  
Specification page

SUNTA

產品規格表 **P204**  
Specification page

## ● P-NTA,SUNTA 3 Flutes Slot Cutting 溝加工

| Work Material<br>被削材 | SS400, AISI 1050, SCM<br>鑄鐵, FC250等<br>結構鋼, 碳素鋼 ~HRC30 |                               | AISI H13, AISI D2等<br>合金鋼, 工具鋼,<br>調質鋼HRC30~35 |                               | AISI 304, AISI 316等<br>沃斯田鐵系列不鏽鋼     |                               | SKD61等<br>淬火鋼HRC45~50                |                               | 耐熱合金英高鎳等                             |                               |
|----------------------|--|-------------------------------|--|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| (mm)<br>外徑           | Speed<br>(min <sup>-1</sup> )<br>迴轉數                   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數           | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| 5                    | 6400   | 428                           | 3800   | 210                           | 3200                                 | 143                           | 1900                                 | 38                            | 1300                                 | 19                            |
| 6                    | 5300   | 435                           | 3200   | 218                           | 2700                                 | 150                           | 1600                                 | 41                            | 1100                                 | 23                            |
| 8                    | 4000   | 450                           | 2400   | 240                           | 2000                                 | 165                           | 1200                                 | 53                            | 800                                  | 26                            |
| 10                   | 3200   | 450                           | 1900   | 233                           | 1600                                 | 165                           | 1000                                 | 53                            | 600                                  | 26                            |
| 12                   | 2700   | 450                           | 1600   | 233                           | 1300                                 | 158                           | 800                                  | 56                            | 500                                  | 30                            |
| 16                   | 2000   | 428                           | 1200   | 240                           | 1000                                 | 135                           | 600                                  | 56                            | 400                                  | 34                            |
| 20                   | 1600   | 405                           | 1000   | 203                           | 800                                  | 120                           | 500                                  | 53                            | 300                                  | 30                            |
| Depth of cut<br>切削深度 |  |                               |  |                               |                                      |                               |                                      |                               |                                      |                               |



P-NTA

產品規格表 **P53**  
Specification page

SUNTA

產品規格表 **P205**  
Specification page

## ● P-NTA,SUNTA 4 Flutes Side Cutting 側面切削

| Work Material 被削材 | SS400, AISI 1050, SCM 鑄鐵, FC250等 結構鋼, 碳素鋼 ~HRC30 |                         | AISI H13, AISI D2等 合金鋼, 工具鋼, 調質鋼HRC30~35 |                         | AISI 304, AISI 316等 沃斯田鐵系列不鏽鋼  |                         | SKD61等 淬火鋼HRC45~50             |                         | 耐熱合金英高鎳等                       |                         |
|-------------------|--|-------------------------|--|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|
| (mm) 外徑           | Speed (min <sup>-1</sup> ) 迴轉數                   | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數           | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 |
| 5                 | 7,600  | 740                     | 4,500                                    | 380                     | 3,800                          | 260                     | 3,200                          | 100                     | 2,500                          | 70                      |
| 6                 | 6,400  | 750                     | 3,700                                    | 390                     | 3,200                          | 290                     | 2,700                          | 110                     | 2,100                          | 75                      |
| 8                 | 4,800  | 780                     | 2,800                                    | 420                     | 2,400                          | 340                     | 2,000                          | 140                     | 1,600                          | 95                      |
| 10                | 3,800  | 790                     | 2,200                                    | 420                     | 1,900                          | 340                     | 1,600                          | 150                     | 1,300                          | 105                     |
| 12                | 3,200  | 790                     | 1,900                                    | 420                     | 1,600                          | 320                     | 1,300                          | 150                     | 1,100                          | 110                     |
| 16                | 2,400  | 770                     | 1,400                                    | 390                     | 1,200                          | 300                     | 1,000                          | 150                     | 800                            | 110                     |
| 20                | 1,900  | 760                     | 1,100                                    | 370                     | 1,000                          | 300                     | 800                            | 140                     | 600                            | 100                     |
| Depth of cut 切削深度 |  |                         |  |                         |                                |                         |                                |                         |                                |                         |

P-NTA

產品規格表 **P53**  
Specification page

SUNTA

產品規格表 **P205**  
Specification page

## ● P-NTA,SUNTA 4 Flutes Slot Cutting 溝加工

| Work Material 被削材 | SS400, AISI 1050, SCM 鑄鐵, FC250等 結構鋼, 碳素鋼 ~HRC30 |                         | AISI H13, AISI D2等 合金鋼, 工具鋼, 調質鋼HRC30~35 |                         | AISI 304, AISI 316等 沃斯田鐵系列不鏽鋼  |                         | SKD61等 淬火鋼HRC45~50             |                         | 耐熱合金英高鎳等                       |                         |
|-------------------|--|-------------------------|--|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|
| (mm) 外徑           | Speed (min <sup>-1</sup> ) 迴轉數                   | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數           | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數 | Feed Rate (mm/min) 進給速度 |
| 5                 | 6,400  | 570                     | 3,800                                    | 280                     | 3,200                          | 190                     | 1,900                          | 50                      | 1,300                          | 25                      |
| 6                 | 5,300  | 580                     | 3,200                                    | 290                     | 2,700                          | 200                     | 1,600                          | 55                      | 1,100                          | 30                      |
| 8                 | 4,000  | 600                     | 2,400                                    | 320                     | 2,000                          | 220                     | 1,200                          | 70                      | 800                            | 35                      |
| 10                | 3,200  | 600                     | 1,900                                    | 310                     | 1,600                          | 220                     | 1,000                          | 70                      | 600                            | 35                      |
| 12                | 2,700  | 600                     | 1,600                                    | 310                     | 1,300                          | 210                     | 800                            | 75                      | 500                            | 40                      |
| 16                | 2,000  | 570                     | 1,200                                    | 320                     | 1,000                          | 180                     | 600                            | 75                      | 400                            | 45                      |
| 20                | 1,600  | 540                     | 1,000                                    | 270                     | 800                            | 160                     | 500                            | 70                      | 300                            | 40                      |
| Depth of cut 切削深度 |  |                         |  |                         |                                |                         |                                |                         |                                |                         |

1. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective; in cutting heat-resisting alloy, it is more effective to use water-soluble cutting fluid.
2. It can improve the speed and feed to cut non-deep depth.
3. If the installation rigidity of machine tool or working material is very low, or shaking and noise happen, please in accordance with reducing the and feeding proportionally, or reduce the depth of cutting.
4. Suggest to right o'clock cutting when Side working.

1. 切削沃斯田鐵系列不鏽鋼時，使用水溶性切削油效果較好，切削耐熱合金時，使用非水溶性切削油效果較好。
2. 若切削深度很淺，可提高轉速和進給速度。
3. 若機床設備或工件材料的安裝剛性很低，或出現震顫和噪音，請相應地同比例降低轉速和進給速度，或者請減少切削深度。
4. 建議在側面加工時使用順銑。

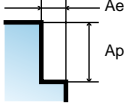
P-XTA

產品規格表 **P54**  
Specification page

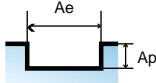
SUXTA

產品規格表 **P206**  
Specification page

## • P-XTA,SUXTA 3 Flutes Side Cutting 側面切削

| Work Material 被削材  | Cast iron FC FCD 鑄鐵   |                         | Mild Steels, Carbon Steels SS400 SS55C(~750N/mm) 一般構造用鋼, 碳素鋼 |                         | Alloy Steels, Tool Steels SCM SKT SKS SKD ~HRC30 合金鋼, 工具鋼 |                         | Hardened Steels Prehardened Steels (Free-cutting) SKT SKD NAK55 HPM1 調質鋼 HRC30~38 調質鋼 (快削) |                         | Hardened Steels Stainless Steels SUS304 SKD 調質鋼 HRC38~45 不鏽鋼                                    |                         |    |    |      |      |  |  |   |  |    |    |      |      |
|--------------------|---|-------------------------|--|-------------------------|---|-------------------------|--|-------------------------|---|-------------------------|----|----|------|------|--|--|---|--|----|----|------|------|
| Cutting Speed 切削速度 | 100~140m/min  |                         | 80~120m/min  |                         | 70~100m/min   |                         | 50~80m/min   |                         | 35~65m/min  |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| (mm) 外徑            | Speed (min <sup>-1</sup> ) 迴轉數  | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數                               | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數                            | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數   | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數  | Feed Rate (mm/min) 進給速度 |    |    |      |      |  |  |   |  |    |    |      |      |
| 6                  | 6350  | 570                     | 5300   | 480                     | 4500  | 270                     | 3450   | 210                     | 2650  | 158                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 8                  | 4750  | 570                     | 4000   | 480                     | 3400  | 308                     | 2600   | 233                     | 2000  | 180                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 10                 | 3800  | 570                     | 3200   | 480                     | 2700  | 323                     | 2050   | 248                     | 1600  | 195                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 12                 | 3200  | 578                     | 2650   | 480                     | 2250  | 113                     | 1700   | 255                     | 1350  | 203                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 14                 | 2750  | 578                     | 2250   | 488                     | 1950  | 353                     | 1500   | 270                     | 1150  | 210                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 16                 | 2400  | 578                     | 2000   | 480                     | 1700  | 360                     | 1300   | 270                     | 1000  | 210                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 18                 | 2100  | 570                     | 1750   | 473                     | 1500  | 360                     | 1150   | 263                     | 900   | 203                     |    |    |      |      |  |  |   |  |    |    |      |      |
| 20                 | 1900  | 570                     | 1600   | 458                     | 1350  | 353                     | 1050   | 263                     | 800   | 195                     |    |    |      |      |  |  |   |  |    |    |      |      |
| Depth of cut 切削深度  | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.4D</td></tr> </table> |                         | Ap   | Ae                      | 1.5D  | 0.4D                    |           |                         | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table> |                         | Ap | Ae | 1.5D | 0.3D |  |  | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table> |  | Ap | Ae | 1.5D | 0.3D |
| Ap                 | Ae  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| 1.5D               | 0.4D  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| Ap                 | Ae  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| 1.5D               | 0.3D  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| Ap                 | Ae  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |
| 1.5D               | 0.3D  |                         |  |                         |   |                         |  |                         |   |                         |    |    |      |      |  |  |   |  |    |    |      |      |

## • P-XTA,SUXTA 3 Flutes Slot Cutting 溝加工

| Work Material 被削材  | Cast Iron FC FCD 鑄鐵  |                         | Mild Steels, Carbon Steels SS400 SS55C(~750N/mm) 一般構造用鋼, 碳素鋼 |                         | Alloy Steels, Tool Steels SCM SKT SKS SKD ~HRC30 合金鋼, 工具鋼 |   | Hardened Steels Prehardened Steels (Free-cutting) SKT SKD NAK55 HPM1 調質鋼 HRC30~38 調質鋼 (快削) |                         | Hardened Steels Stainless Steels SUS304 SKD 調質鋼 HRC38~45 不鏽鋼 |                         |  |   |  |    |      |
|--------------------|--|-------------------------|--|-------------------------|---|---|--|-------------------------|--|-------------------------|--|---|--|----|------|
| Cutting Speed 切削速度 | 80~120m/min  |                         | 70~100m/min  |                         | 55~85m/min  |   | 40~70m/min   |                         | 30~60m/min   |                         |  |   |  |    |      |
| (mm) 外徑            | Speed (min <sup>-1</sup> ) 迴轉數   | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數                               | 進給速度 Feed Rate (mm/min) | Speed (min <sup>-1</sup> ) 迴轉數                            | Feed Rate (mm/min) 進給速度   | Speed (min <sup>-1</sup> ) 迴轉數   | Feed Rate (mm/min) 進給速度 | Speed (min <sup>-1</sup> ) 迴轉數                               | Feed Rate (mm/min) 進給速度 |  |   |  |    |      |
| 6                  | 5,300  | 480                     | 4,500  | 405                     | 3,700   | 225   | 2,900  | 173                     | 2,400  | 143                     |  |   |  |    |      |
| 8                  | 4,000  | 480                     | 3,400  | 405                     | 2,800   | 255   | 2,200  | 195                     | 1,800  | 165                     |  |   |  |    |      |
| 10                 | 3,200  | 480                     | 2,700  | 405                     | 2,250   | 270   | 1,750  | 210                     | 1,450  | 173                     |  |   |  |    |      |
| 12                 | 2,650  | 480                     | 2,250  | 405                     | 1,850   | 278   | 1,450  | 217                     | 1,200  | 180                     |  |   |  |    |      |
| 14                 | 2,250  | 473                     | 1,950  | 428                     | 1,600   | 285   | 1,250  | 225                     | 1,000  | 180                     |  |   |  |    |      |
| 16                 | 2,000  | 480                     | 1,700  | 405                     | 1,400   | 293   | 1,100  | 233                     | 900  | 188                     |  |   |  |    |      |
| 18                 | 1,750  | 473                     | 1,500  | 405                     | 1,250   | 300   | 950  | 218                     | 800  | 180                     |  |   |  |    |      |
| 20                 | 1,600  | 480                     | 1,350  | 383                     | 1,100   | 293   | 900  | 225                     | 700  | 173                     |  |   |  |    |      |
| Depth of cut 切削深度  | <table border="1"> <tr><td>Ap</td></tr> <tr><td>0.75D</td></tr> <tr><td>Ap Max=12mm</td></tr> </table> |                         | Ap   | 0.75D                   | Ap Max=12mm   |  |  |                         |  |                         |  | <table border="1"> <tr><td>Ap</td></tr> <tr><td>0.5D</td></tr> </table> |  | Ap | 0.5D |
| Ap                 |  |                         |  |                         |   |   |  |                         |  |                         |  |   |  |    |      |
| 0.75D              |  |                         |  |                         |   |   |  |                         |  |                         |  |   |  |    |      |
| Ap Max=12mm        |  |                         |  |                         |   |   |  |                         |  |                         |  |   |  |    |      |
| Ap                 |  |                         |  |                         |   |   |  |                         |  |                         |  |   |  |    |      |
| 0.5D               |  |                         |  |                         |   |   |  |                         |  |                         |  |   |  |    |      |

1. Use air blow. When using cutting fluids. Use high-quality fluid with high smoke retardant properties.
2. When chattering occurs. Reduce the speed and feed simultaneously.
3. Use a rigid and precision machine and holder.

1. 請採用吹氣冷卻方式或使用不易產生油煙的切削液。
2. 在產生異常震動時, 請降低轉速和進給速度。
3. 請使用精度高剛性好的設備和夾具。

P-XTA

產品規格表 **P55**

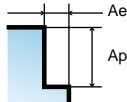
Specification page

SUXTA

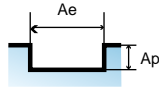
產品規格表 **P207**

Specification page

## ● P-XTA,SUXTA 4 Flutes Side Cutting 側面切削

| Work Material<br>被削材  | Cast iron FC FCD<br>鑄鐵  |                               | Mild Steels, Carbon Steels<br>SS400 SS55C(~750N/mm)<br>一般構造用鋼, 碳素鋼 |                               | Alloy Steels, Tool Steels<br>SCM SKT SKS SKD<br>~HRC30<br>合金鋼, 工具鋼 |                               | Hardened Steels<br>Prehardened Steels<br>(Free-cutting)<br>SKT SKD NAK55 HPM1<br>調質鋼 HRC30~38<br>調質鋼 (快削) |                               | Hardened Steels<br>Stainless Steels<br>SUS304 SKD<br>調質鋼 HRC38~45<br>不鏽鋼                        |                               |    |    |      |      |  |  |  |  |
|-----------------------|---|-------------------------------|--|-------------------------------|--|-------------------------------|---|-------------------------------|---|-------------------------------|----|----|------|------|--|--|--|--|
| Cutting Speed<br>切削速度 | 100~140m/min  |                               | 80~120m/min  |                               | 70~100m/min  |                               | 50~80m/min  |                               | 35~65m/min  |                               |    |    |      |      |  |  |  |  |
| (mm)<br>外徑            | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                               | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                               | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |    |    |      |      |  |  |  |  |
| 6                     | 6,350   | 760                           | 5,300  | 640                           | 4,500  | 360                           | 3,450   | 280                           | 2,650   | 210                           |    |    |      |      |  |  |  |  |
| 8                     | 4,750   | 760                           | 4,000  | 640                           | 3,400  | 410                           | 2,600   | 310                           | 2,000   | 240                           |    |    |      |      |  |  |  |  |
| 10                    | 3,800   | 760                           | 3,200  | 640                           | 2,700  | 430                           | 2,050   | 330                           | 1,600   | 260                           |    |    |      |      |  |  |  |  |
| 12                    | 3,200   | 770                           | 2,650  | 640                           | 2,250  | 450                           | 1,700   | 340                           | 1,350   | 270                           |    |    |      |      |  |  |  |  |
| 14                    | 2750  | 770                           | 2,250  | 650                           | 1,950  | 470                           | 1,500   | 360                           | 1,150   | 280                           |    |    |      |      |  |  |  |  |
| 16                    | 2,400   | 770                           | 2,000  | 640                           | 1,700  | 480                           | 1,300   | 360                           | 1,000   | 280                           |    |    |      |      |  |  |  |  |
| 18                    | 2,100   | 760                           | 1,750  | 630                           | 1,500  | 480                           | 1,150   | 350                           | 900   | 270                           |    |    |      |      |  |  |  |  |
| 20                    | 1,900   | 760                           | 1,600  | 610                           | 1,350  | 470                           | 1,050   | 350                           | 800   | 260                           |    |    |      |      |  |  |  |  |
| Depth of cut<br>切削深度  | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.4D</td></tr> </table> |                               | Ap   | Ae                            | 1.5D   | 0.4D                          |                          |                               | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.3D</td></tr> </table> |                               | Ap | Ae | 1.5D | 0.3D |  |  |  |  |
| Ap                    | Ae  |                               |  |                               |  |                               |   |                               |   |                               |    |    |      |      |  |  |  |  |
| 1.5D                  | 0.4D  |                               |  |                               |  |                               |   |                               |   |                               |    |    |      |      |  |  |  |  |
| Ap                    | Ae  |                               |  |                               |  |                               |   |                               |   |                               |    |    |      |      |  |  |  |  |
| 1.5D                  | 0.3D  |                               |  |                               |  |                               |   |                               |   |                               |    |    |      |      |  |  |  |  |

## ● P-XTA,SUXTA 4 Flutes Slot Cutting 溝加工

| Work Material<br>被削材  | Cast Iron FC FCD<br>鑄鐵   |                               | Mild Steels, Carbon Steels<br>SS400 SS55C(~750N/mm)<br>一般構造用鋼, 碳素鋼 |                               | Alloy Steels, Tool Steels<br>SCM SKT SKS SKD<br>~HRC30<br>合金鋼, 工具鋼 |   | Hardened Steels<br>Prehardened Steels<br>(Free-cutting)<br>SKT SKD NAK55 HPM1<br>調質鋼 HRC30~38<br>調質鋼 (快削) |                               | Hardened Steels<br>Stainless Steels<br>SUS304 SKD<br>調質鋼 HRC38~45<br>不鏽鋼 |                               |  |   |  |    |      |
|-----------------------|--|-------------------------------|--|-------------------------------|--|---|---|-------------------------------|--|-------------------------------|--|---|--|----|------|
| Cutting Speed<br>切削速度 | 80~120m/min  |                               | 70~100m/min  |                               | 55~85m/min   |   | 40~70m/min  |                               | 30~60m/min   |                               |  |   |  |    |      |
| (mm)<br>外徑            | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                               | 進給速度<br>Feed Rate<br>(mm/min) | Speed<br>(min <sup>-1</sup> )<br>迴轉數                               | Feed Rate<br>(mm/min)<br>進給速度   | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                                     | Feed Rate<br>(mm/min)<br>進給速度 |  |   |  |    |      |
| 6                     | 5,300  | 640                           | 4,500  | 540                           | 3,700  | 300   | 2,900   | 230                           | 2,400  | 190                           |  |   |  |    |      |
| 8                     | 4,000  | 640                           | 3,400  | 540                           | 2,800  | 340   | 2,200   | 260                           | 1,800  | 220                           |  |   |  |    |      |
| 10                    | 3,200  | 640                           | 2,700  | 540                           | 2,250  | 360   | 1,750   | 280                           | 1,450  | 230                           |  |   |  |    |      |
| 12                    | 2,650  | 640                           | 2,250  | 540                           | 1,850  | 370   | 1,450   | 290                           | 1,200  | 240                           |  |   |  |    |      |
| 14                    | 2,250  | 630                           | 1,950  | 570                           | 1,600  | 380   | 1,250   | 300                           | 1,000  | 240                           |  |   |  |    |      |
| 16                    | 2,000  | 640                           | 1,700  | 540                           | 1,400  | 390   | 1,100   | 310                           | 900  | 250                           |  |   |  |    |      |
| 18                    | 1,750  | 630                           | 1,500  | 540                           | 1,250  | 400   | 950   | 290                           | 800  | 240                           |  |   |  |    |      |
| 20                    | 1,600  | 640                           | 1,350  | 510                           | 1,100  | 390   | 900   | 300                           | 700  | 230                           |  |   |  |    |      |
| Depth of cut<br>切削深度  | <table border="1"> <tr><td>Ap</td></tr> <tr><td>0.75D</td></tr> <tr><td>Ap Max=12mm</td></tr> </table> |                               | Ap   | 0.75D                         | Ap Max=12mm  |  |   |                               |  |                               |  | <table border="1"> <tr><td>Ap</td></tr> <tr><td>0.5D</td></tr> </table> |  | Ap | 0.5D |
| Ap                    |  |                               |  |                               |  |   |   |                               |  |                               |  |   |  |    |      |
| 0.75D                 |  |                               |  |                               |  |   |   |                               |  |                               |  |   |  |    |      |
| Ap Max=12mm           |  |                               |  |                               |  |   |   |                               |  |                               |  |   |  |    |      |
| Ap                    |  |                               |  |                               |  |   |   |                               |  |                               |  |   |  |    |      |
| 0.5D                  |  |                               |  |                               |  |   |   |                               |  |                               |  |   |  |    |      |

1. Use air blow. When using cutting fluids. Use high-quality fluid with high smoke retardant properties.
2. When chattering occurs. Reduce the speed and feed simultaneously.
3. Use a rigid and precision machine and holder.

1. 請採用吹氣冷卻方式或使用不易產生油煙的切削液。
2. 在產生異常震動時, 請降低轉速和進給速度。
3. 請使用精度高剛性好的設備和夾具。

產品規格表 **P56-59**  
Specification page

### ● P-TTA 2 Flutes Standard Cutting Conditions 標準切削

| WORK MATERIAL<br>被切削材 | Copper<br>銅                          |                               |                      | Carbon Steels, Alloy Steels, S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron 碳素鋼, 合金鋼-HRC30 |                               |                      | HRC30~45<br>Alloy Steels, Tool Steels, 調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13 合金鋼, 工具鋼 |                               |                      | Austenitic stainless steels<br>SUS304, SUS316等<br>沃斯田鐵系列不鏽鋼 |                               |                      | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13 熱處理鋼HRC45~50 |                               |                      |
|-----------------------|--------------------------------------|-------------------------------|----------------------|---|-------------------------------|----------------------|--|-------------------------------|----------------------|---|-------------------------------|----------------------|--|-------------------------------|----------------------|
| Cutting Speed<br>切削速度 | 80~150m/min                          |                               |                      | 50~100m/min   |                               |                      | 50~70m/min   |                               |                      | 30~60m/min  |                               |                      | 20~40m/min   |                               |                      |
| Shank<br>柄徑(mm)       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                        | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                   | Feed Rate<br>(mm/min)<br>進給速度 |                      |
|                       |                                      | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |   | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |  | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |   | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |  | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |
| 4                     | 12,000                               | 1,000                         | 330                  | 7,500   | 600                           | 480                  | 5,200  | 400                           | 320                  | 3,100   | 300                           | 180                  | 2,400  | 75                            | 60                   |
| 6                     | 8,000                                | 1,000                         | 330                  | 5,000   | 600                           | 480                  | 3,500  | 400                           | 320                  | 2,100   | 300                           | 180                  | 1,600  | 75                            | 60                   |
| 8                     | 6,000                                | 1,000                         | 330                  | 4,000   | 520                           | 410                  | 2,800  | 350                           | 280                  | 1,600   | 260                           | 150                  | 1,200  | 65                            | 50                   |
| 10                    | 4,800                                | 1,000                         | 330                  | 3,200   | 450                           | 360                  | 2,200  | 300                           | 240                  | 1,300   | 230                           | 130                  | 1,000  | 65                            | 50                   |
| 12                    | 4,000                                | 1,000                         | 330                  | 2,700   | 410                           | 320                  | 1,900  | 270                           | 210                  | 1,100   | 210                           | 120                  | 800  | 65                            | 50                   |
| 16                    | 3,000                                | 1,000                         | 330                  | 2,000   | 240                           | 190                  | 1,400  | 210                           | 160                  | 840   | 160                           | 100                  | 600  | 60                            | 45                   |

| DEPTH OF CUT<br>加工深度 | $\leq 0.1D (D \leq \phi 3)$<br>$\leq 0.2D (D > \phi 3)$ |  | $\leq 1.5D$ | $\leq 0.1D (D < \phi 2)$<br>$\leq 0.2D (D \geq \phi 2)$ |  | $\leq 0.02D$ |  | $\leq 0.05D (\phi 0.5 \leq D \leq \phi 2)$<br>$\leq 0.1D (D > \phi 2)$ |
|----------------------|---|--|-------------|---|--|--------------|--|--|
|                      |   |  |             |   |  |              |  |  |

產品規格表 **P60-61**  
Specification page

### ● P-LTTA 2 Flutes Standard Cutting Conditions 標準切削

| WORK MATERIAL<br>被切削材 | Carbon Steels, Alloy Steels, S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron 碳素鋼, 合金鋼-HRC30 |                               |                      | HRC30~45<br>Alloy Steels, Tool Steels, 調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13 合金鋼, 工具鋼 |                               |                      | Austenitic stainless steels<br>SUS304, SUS316等<br>沃斯田鐵系列不鏽鋼 |                               |                      | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13 熱處理鋼HRC45~50 |                               |                      |
|-----------------------|---|-------------------------------|----------------------|--|-------------------------------|----------------------|---|-------------------------------|----------------------|--|-------------------------------|----------------------|
| Cutting Speed<br>切削速度 | 30~50m/min  |                               |                      | 30~40m/min   |                               |                      | 20~30m/min  |                               |                      | 15~25m/min   |                               |                      |
| Shank<br>柄徑(mm)       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                        | Feed Rate<br>(mm/min)<br>進給速度 |                      | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                   | Feed Rate<br>(mm/min)<br>進給速度 |                      |
|                       |   | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |  | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |   | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |  | Side<br>Milling<br>側銑         | Slotting<br>溝銑<br>切削 |
| 4                     | 3,400   | 80                            | 60                   | 2,700  | 65                            | 45                   | 2,100   | 50                            |                      | 1,700  | 35                            | 25                   |
|                       |   |                               |                      |  |                               |                      | 1,600   |                               | 30                   |  |                               |                      |
| 6                     | 2,500   | 120                           | 60                   | 2,000  | 100                           | 50                   | 1,500   | 75                            |                      | 1,300  | 50                            | 25                   |
|                       |   |                               |                      |  |                               |                      | 1,100   |                               | 30                   |  |                               |                      |
| 8                     | 1,900   | 130                           | 60                   | 1,500  | 100                           | 50                   | 1,200   | 80                            |                      | 1,000  | 50                            | 25                   |
|                       |   |                               |                      |  |                               |                      | 900   |                               | 30                   |  |                               |                      |
| 10                    | 1,600   | 130                           | 60                   | 1,300  | 100                           | 50                   | 950   | 75                            |                      | 800  | 50                            | 25                   |
|                       |   |                               |                      |  |                               |                      | 710   |                               | 30                   |  |                               |                      |
| 12                    | 1,300   | 120                           | 60                   | 1,100  | 100                           | 50                   | 800   | 75                            |                      | 670  | 50                            | 25                   |
|                       |   |                               |                      |  |                               |                      | 600   |                               | 30                   |  |                               |                      |

| DEPTH OF CUT<br>加工深度 | $\leq 0.05D$<br>(Max 0.5mm) |  | $\leq 2.5D$ | $\leq 0.1D (D < \phi 2)$<br>$\leq 0.2D (D \geq \phi 2)$<br>(Max 3mm) |  | $\leq 0.02D$<br>(Max 0.3mm) |  | $\leq 0.05D$<br>(Max 0.5mm) |
|----------------------|-----------------------------|--|-------------|--|--|-----------------------------|--|-----------------------------|
|                      |                             |  |             |  |  |                             |  |                             |

Unit/單位: mm

P-MIB

產品規格表 **P62**  
Specification page

P-SLB/P-MLB/P-LLB/P-XLB

產品規格表 **P65**  
Specification page

ACB

產品規格表 **P171-172**  
Specification page

SUMIB

產品規格表 **P208**  
Specification page

SUBT

產品規格表 **P209**  
Specification page

SULBT

產品規格表 **P211**  
Specification page

SBS

產品規格表 **P269**  
Specification page

### ● P-MIB, P-SLB, P-MLB, P-LLB, P-XLB, ACB, SUMIB, SUBT, SULBT, SBS 2 Flutes

#### Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels S50C<br>碳素鋼            |                               | Alloy Steels<br>Prehardened Steels<br>SCM SKD SUS HPM NAK<br>合金鋼・調質鋼 |                               | Hardened Steels<br>SKD61-HRC50<br>調質鋼 |                               | Aluminum<br>鋁                        |                               | Copper<br>銅                          |                               |
|-----------------------|--------------------------------------|-------------------------------|--|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 150m/min                             |                               | 120~150m/min   |                               | 80~100m/min                           |                               | 150~m/min                            |                               | 100~150m/min                         |                               |
| R                     | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                                 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.15R                | 40,000                               | 400                           | 40,000   | 360                           | 40,000                                | 330                           | 40,000                               | 440                           | 40,000                               | 400                           |
| D0.2R                 | 40,000                               | 500                           | 40,000   | 480                           | 40,000                                | 500                           | 40,000                               | 480                           | 40,000                               | 480                           |
| D0.25R                | 40,000                               | 620                           | 40,000   | 610                           | 40,000                                | 620                           | 40,000                               | 540                           | 40,000                               | 540                           |
| D0.3R                 | 40,000                               | 750                           | 40,000   | 750                           | 40,000                                | 750                           | 40,000                               | 600                           | 40,000                               | 600                           |
| D0.4R                 | 40,000                               | 960                           | 40,000   | 1,000                         | 36,000                                | 900                           | 40,000                               | 800                           | 40,000                               | 800                           |
| D0.5R                 | 40,000                               | 1,200                         | 38,000   | 1,200                         | 29,000                                | 900                           | 40,000                               | 1,000                         | 40,000                               | 830                           |
| D0.75R                | 30,000                               | 1,270                         | 25,500   | 1,100                         | 19,000                                | 700                           | 40,000                               | 1,360                         | 30,000                               | 1,160                         |
| D1R                   | 24,000                               | 1,160                         | 19,000   | 800                           | 14,300                                | 600                           | 40,000                               | 2,000                         | 24,000                               | 1,200                         |
| D1.25R                | 19,000                               | 1,000                         | 15,300   | 670                           | 11,500                                | 510                           | 38,000                               | 2,400                         | 19,000                               | 1,200                         |
| D1.5R                 | 16,000                               | 930                           | 13,000   | 600                           | 9,600                                 | 460                           | 32,000                               | 2,400                         | 16,000                               | 1,200                         |
| D1.75R                | 13,700                               | 930                           | 11,400   | 580                           | 8,200                                 | 450                           | 27,300                               | 2,400                         | 13,600                               | 1,200                         |
| D2R                   | 12,000                               | 930                           | 10,000   | 570                           | 7,200                                 | 450                           | 24,000                               | 2,400                         | 12,000                               | 1,200                         |
| D2.5R                 | 9,600                                | 930                           | 8,000  | 560                           | 5,700                                 | 450                           | 19,000                               | 2,400                         | 9,600                                | 1,200                         |
| D3R                   | 8,000                                | 930                           | 6,400  | 540                           | 4,800                                 | 450                           | 16,000                               | 2,400                         | 8,000                                | 1,200                         |
| D4R                   | 6,000                                | 900                           | 4,800  | 540                           | 3,600                                 | 450                           | 12,000                               | 2,400                         | 6,000                                | 1,200                         |
| D5R                   | 4,800                                | 900                           | 3,800  | 540                           | 2,900                                 | 450                           | 9,600                                | 2,300                         | 4,800                                | 1,150                         |
| D6R                   | 4,000                                | 900                           | 3,200  | 540                           | 2,400                                 | 450                           | 8,000                                | 2,100                         | 4,000                                | 1,050                         |
| D7R                   | 3,400                                | 900                           | 2,750  | 540                           | 2,050                                 | 450                           | 6,800                                | 2,000                         | 3,400                                | 1,000                         |
| D8R                   | 3,000                                | 900                           | 2,400  | 540                           | 1,800                                 | 450                           | 6,000                                | 2,000                         | 3,000                                | 1,000                         |
| D10R                  | 2,400                                | 900                           | 1,900  | 520                           | 1,450                                 | 450                           | 4,800                                | 2,000                         | 2,400                                | 1,000                         |
| D12.5R                | 1,900                                | 720                           | 1,520  | 450                           | 1,160                                 | 420                           | 3,840                                | 1,900                         | 1,920                                | 940                           |

Depth of cut  
(R:球頭半徑)  
切削量基準

|                  |                  |                          |
|------------------|------------------|--------------------------|
| 0.1xR (~45HRC)   | (R0.1~0.5=0.2XR) | -0.16XR R ≤ 0.3 (~45HRC) |
| -0.08XR (~50HRC) | 0.3XR            | -0.25XR R ≤ 3 (~45HRC)   |
|                  |                  | -0.17XR R ≥ 4 (~45HRC)   |
|                  |                  | -0.05XR (~50HRC)         |

- When Slotting, reduce the feed by 60% from above values.
  - Length of overhang is 4 times dia, as standard. When it is longer then 4 times dia, follow figures of above table.
  - Use Oil-mist coolant or Air blow.
  - Adjust both spindle speed and feed according to Milling conditions and machine rigidity.
- 溝加工時之進給速度，請設定為上述值之 60%。
  - 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
  - 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
  - 主軸迴轉速及床台進給速度，請以相同比例作適度調整。

P-MIB

產品規格表 **P62**  
Specification page

P-SLB/P-MLB/P-LLB/P-XLB

產品規格表 **P65**  
Specification page

ACB

產品規格表 **P171-172**  
Specification page

SUMIB

產品規格表 **P208**  
Specification page

SUBT

產品規格表 **P209**  
Specification page

SULBT

產品規格表 **P211**  
Specification page

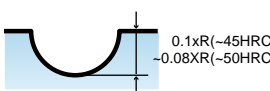
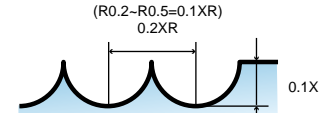
SBS

產品規格表 **P269**  
Specification page

## ● P-MIB,P-SLB,P-MLB,P-LLB,P-XLB,ACB,SUMIB,SUBT,SULBT,SBS 2 Flutes HIGH - SPEED Milling Conditions 高速標準切削

| Work Material<br>被削材  | Carbon Steels<br>S50C<br>碳素鋼         |                               | Alloy Steels<br>SCM, SKD, SUS<br>合金鋼 |                               | Prehardened Steels<br>HPM, NAK<br>調質鋼 |                               | Hardened Steels<br>SKD61~HRC50<br>調質鋼 |                               |
|-----------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 250m/min                             |                               | 200m/min                             |                               | 180m/min                              |                               | 100m/min                              |                               |
| R                     | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.15R                | ~ 40,000                             | ~ 1,200                       | ~ 40,000                             | ~ 960                         | ~ 40,000                              | ~ 800                         | ~ 40,000                              | 350                           |
| D0.2R                 | ~ 40,000                             | ~ 1,200                       | ~ 40,000                             | ~ 960                         | ~ 40,000                              | ~ 800                         | ~ 40,000                              | 480                           |
| D0.25R                | ~ 40,000                             | ~ 1,200                       | ~ 40,000                             | ~ 960                         | ~ 40,000                              | ~ 800                         | ~ 40,000                              | 520                           |
| D0.3R                 | ~ 40,000                             | ~ 1,200                       | ~ 40,000                             | ~ 960                         | ~ 40,000                              | ~ 800                         | ~ 40,000                              | 560                           |
| D0.4R                 | ~ 40,000                             | ~ 2,400                       | ~ 40,000                             | ~ 2,000                       | ~ 40,000                              | ~ 1,760                       | 40,000                                | 1,000                         |
| D0.5R                 | ~ 40,000                             | ~ 2,400                       | ~ 40,000                             | ~ 2,000                       | ~ 40,000                              | ~ 1,760                       | 32,000                                | 1,500                         |
| D0.75R                | ~ 40,000                             | ~ 3,700                       | ~ 40,000                             | ~ 3,000                       | 38,000                                | 2,700                         | 21,300                                | 1,500                         |
| D1R                   | 40,000                               | 5,000                         | 32,000                               | 3,200                         | 29,000                                | 2,900                         | 16,000                                | 1,500                         |
| D1.25R                | 32,000                               | 5,000                         | 25,000                               | 3,200                         | 23,000                                | 2,900                         | 12,800                                | 1,500                         |
| D1.5R                 | 27,000                               | 5,000                         | 21,000                               | 3,200                         | 19,000                                | 2,900                         | 10,600                                | 1,500                         |
| D1.75R                | 23,000                               | 5,000                         | 18,000                               | 3,200                         | 16,400                                | 2,900                         | 9,100                                 | 1,500                         |
| D2R                   | 20,000                               | 4,000                         | 16,000                               | 3,200                         | 14,000                                | 2,900                         | 8,000                                 | 1,500                         |
| D2.5R                 | 16,000                               | 3,500                         | 12,800                               | 2,500                         | 11,500                                | 2,300                         | 6,400                                 | 1,300                         |
| D3R                   | 13,500                               | 3,000                         | 10,600                               | 2,000                         | 9,500                                 | 1,800                         | 5,300                                 | 1,200                         |
| D4R                   | 10,000                               | 3,000                         | 8,000                                | 2,000                         | 7,200                                 | 1,800                         | 4,000                                 | 1,200                         |
| D5R                   | 8,000                                | 3,000                         | 6,400                                | 2,000                         | 5,700                                 | 1,800                         | 3,200                                 | 1,200                         |
| D6R                   | 6,700                                | 2,500                         | 5,300                                | 1,800                         | 4,800                                 | 1,600                         | 2,700                                 | 1,200                         |
| D8R                   | 5,000                                | 2,000                         | 4,000                                | 1,500                         | 3,600                                 | 1,300                         | 2,000                                 | 800                           |
| D10R                  | 4,000                                | 1,500                         | 3,200                                | 1,200                         | 2,900                                 | 1,000                         | 1,600                                 | 800                           |
| D12.5R                | 3,200                                | 1,200                         | 2,550                                | 900                           | 2,300                                 | 700                           | 1,280                                 | 760                           |

Depth of cut  
切削量基準  
(R:球頭半徑)

1. When Slotting, reduce the feed by 60% from above values.
2. Length of overhang is 4 times dia. as standard. When it is longer than 4 times dia., follow figures of above table.
3. Recommend Oil-mist coolant or Air blow.
4. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
5. Use a rigid machine and holder.

1. 溝加工時之進給速度，請設定為上述值之 60%。
2. 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
3. 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
4. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
5. 請使用較具剛性之機械設備及夾頭。

產品規格表 **P63**

Specification page

## • P-SSB/P-MSB/P-SB 2 Flutes Regular Milling 標準切削

| WORK MATERIAL<br>被切削材 | COPPER, ALUMINUM ALLOY<br>銅、鋁合金 |                                      |                         |                               | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                                      |                         |                               | HARDENED STEELS, PREHARDENED STEELS, STAINLESS<br>STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                                      |                         |                               |          |                                      |                         |                               |
|-----------------------|---------------------------------|--------------------------------------|-------------------------|-------------------------------|---|--------------------------------------|-------------------------|-------------------------------|--|--------------------------------------|-------------------------|-------------------------------|----------|--------------------------------------|-------------------------|-------------------------------|
|                       |                                 |                                      |                         |                               | ~32HRC  |                                      |                         |                               | HRC33~41   |                                      |                         |                               | HRC42~50 |                                      |                         |                               |
|                       | R                               | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |          | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |
| R 0.05                | 40,000                          | 120                                  | 0.003                   | 0.005                         | 32,000  | 60                                   | 0.005                   | 0.005                         | 32,000   | 40                                   | 0.005                   | 0.005                         | 32,000   | 28                                   | 0.005                   | 0.005                         |
| R 0.1                 | 40,000                          | 240                                  | 0.010                   | 0.020                         | 32,000  | 160                                  | 0.010                   | 0.010                         | 32,000   | 160                                  | 0.010                   | 0.010                         | 32,000   | 160                                  | 0.005                   | 0.005                         |
| R0.2                  | 40,000                          | 392                                  | 0.020                   | 0.080                         | 32,000  | 328                                  | 0.020                   | 0.080                         | 32,000   | 264                                  | 0.040                   | 0.080                         | 32,000   | 164                                  | 0.020                   | 0.040                         |
| R0.3                  | 40,000                          | 464                                  | 0.030                   | 0.120                         | 32,000  | 392                                  | 0.030                   | 0.120                         | 32,000   | 336                                  | 0.060                   | 0.120                         | 32,000   | 212                                  | 0.030                   | 0.060                         |
| R0.4                  | 40,000                          | 528                                  | 0.040                   | 0.160                         | 32,000  | 440                                  | 0.040                   | 0.160                         | 31,500   | 336                                  | 0.080                   | 0.160                         | 27,500   | 232                                  | 0.040                   | 0.080                         |
| R0.5                  | 32,000                          | 600                                  | 0.050                   | 0.200                         | 31,500  | 496                                  | 0.050                   | 0.200                         | 25,000   | 320                                  | 0.100                   | 0.200                         | 22,000   | 228                                  | 0.050                   | 0.100                         |
| R1                    | 19,000                          | 600                                  | 0.200                   | 0.400                         | 15,500  | 496                                  | 0.200                   | 0.400                         | 12,500   | 320                                  | 0.200                   | 0.400                         | 11,000   | 232                                  | 0.100                   | 0.200                         |
| R1.5                  | 12,500                          | 608                                  | 0.300                   | 0.600                         | 10,500  | 504                                  | 0.300                   | 0.600                         | 8,450  | 324                                  | 0.300                   | 0.600                         | 7,400    | 232                                  | 0.150                   | 0.300                         |
| R2                    | 9,500                           | 608                                  | 0.400                   | 0.800                         | 7,950   | 504                                  | 0.400                   | 0.800                         | 6,350  | 356                                  | 0.400                   | 0.800                         | 5,550    | 296                                  | 0.200                   | 0.400                         |
| R3                    | 6,300                           | 640                                  | 0.600                   | 1.200                         | 5,300   | 536                                  | 0.600                   | 1.200                         | 4,200  | 372                                  | 0.600                   | 1.200                         | 3,700    | 312                                  | 0.300                   | 0.600                         |
| R4                    | 4,750                           | 760                                  | 0.800                   | 1.600                         | 3,950   | 632                                  | 0.800                   | 1.600                         | 3,150  | 444                                  | 0.800                   | 1.600                         | 2,750    | 364                                  | 0.400                   | 0.800                         |
| R5                    | 3,800                           | 712                                  | 1.000                   | 2.000                         | 3,150   | 596                                  | 1.000                   | 2.000                         | 2,500  | 420                                  | 1.000                   | 2.000                         | 2,200    | 344                                  | 0.500                   | 1.000                         |
| R6                    | 3,170                           | 672                                  | 1.200                   | 2.400                         | 2,650   | 560                                  | 1.200                   | 2.400                         | 2,100  | 392                                  | 1.200                   | 2.400                         | 1,850    | 344                                  | 0.600                   | 1.200                         |
| R8                    | 2,400                           | 504                                  | 1.600                   | 3.200                         | 1,990   | 420                                  | 1.600                   | 3.200                         | 1,580  | 296                                  | 1.600                   | 3.200                         | 1,390    | 260                                  | 0.800                   | 1.600                         |
| R10                   | 1,900                           | 400                                  | 2.000                   | 4.000                         | 1,590   | 336                                  | 2.000                   | 4.000                         | 1,260  | 232                                  | 2.000                   | 4.000                         | 1,110    | 208                                  | 1.000                   | 2.000                         |

DEPTH OF CUT  
加工深度

## • P-SSB/P-MSB/P-SB 2 Flutes HIGH-SPEED LIGHT Milling P-SSB/P-MSB/P-SB 2刃 高速切削

| WORK MATERIAL<br>被切削材 | COPPER, ALUMINUM ALLOY<br>銅、鋁合金 |                                      |                         |                               | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                                      |                         |                               | HARDENED STEELS, PREHARDENED STEELS, STAINLESS<br>STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                                      |                         |                               |          |                                      |                         |                               |
|-----------------------|---------------------------------|--------------------------------------|-------------------------|-------------------------------|---|--------------------------------------|-------------------------|-------------------------------|--|--------------------------------------|-------------------------|-------------------------------|----------|--------------------------------------|-------------------------|-------------------------------|
|                       |                                 |                                      |                         |                               | ~32HRC  |                                      |                         |                               | HRC33~41   |                                      |                         |                               | HRC42~50 |                                      |                         |                               |
|                       | R                               | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |   | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |  | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |          | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度<br>Ap Pf |
| R 0.5                 | 50,000                          | 2,680                                | 0.020                   | 0.050                         | 50,000  | 2,240                                | 0.020                   | 0.050                         | 50,000   | 2,000                                | 0.020                   | 0.050                         | 47,500   | 1,800                                | 0.020                   | 0.050                         |
| R1                    | 31,500                          | 2,680                                | 0.040                   | 0.100                         | 25,000  | 2,240                                | 0.040                   | 0.100                         | 24,500   | 2,000                                | 0.040                   | 0.100                         | 23,500   | 1,800                                | 0.040                   | 0.100                         |
| R1.5                  | 21,000                          | 2,680                                | 0.060                   | 0.150                         | 16,500  | 2,240                                | 0.060                   | 0.150                         | 16,000   | 2,000                                | 0.060                   | 0.150                         | 15,500   | 1,800                                | 0.060                   | 0.150                         |
| R2                    | 15,500                          | 3,264                                | 0.080                   | 0.200                         | 15,500  | 2,720                                | 0.080                   | 0.200                         | 15,000   | 2,200                                | 0.080                   | 0.200                         | 13,500   | 1,960                                | 0.080                   | 0.200                         |
| R3                    | 10,500                          | 4,128                                | 0.120                   | 0.300                         | 13,500  | 3,440                                | 0.300                   | 0.600                         | 11,500   | 2,200                                | 0.300                   | 0.600                         | 9,500    | 1,800                                | 0.120                   | 0.300                         |
| R4                    | 7,900                           | 3,072                                | 0.160                   | 0.400                         | 10,000  | 2,560                                | 0.400                   | 0.800                         | 8,950  | 1,680                                | 0.400                   | 0.800                         | 7,150    | 1,360                                | 0.160                   | 0.400                         |
| R5                    | 6,300                           | 2,496                                | 0.200                   | 0.500                         | 8,250   | 2,080                                | 0.500                   | 1.000                         | 7,150  | 1,360                                | 0.500                   | 1.000                         | 5,700    | 1,080                                | 0.200                   | 0.500                         |
| R6                    | 5,250                           | 2,064                                | 0.240                   | 0.600                         | 6,850   | 1,720                                | 0.500                   | 2.400                         | 5,950  | 1,120                                | 0.500                   | 2.400                         | 4,750    | 880                                  | 0.240                   | 0.600                         |
| R8                    | 4,950                           | 1,240                                | 0.320                   | 0.800                         | 4,110   | 1,032                                | 0.500                   | 3.200                         | 4,460  | 840                                  | 0.500                   | 3.200                         | 3,560    | 656                                  | 0.320                   | 0.800                         |
| R10                   | 3,950                           | 992                                  | 0.400                   | 1.000                         | 3,290   | 824                                  | 0.500                   | 4.000                         | 3,570  | 672                                  | 0.500                   | 4.000                         | 2,850    | 528                                  | 0.320                   | 1.000                         |

DEPTH OF CUT  
加工深度

產品規格表 **P64**

Specification page

## ● P-SSB/P-MSB/P-SB 4 Flutes Regular Milling 標準切削

| WORK MATERIAL<br>被切削材 | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-----------------------|--------------------------------------|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                       |                                      |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| R                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| R 0.05                | 40,000                               | 180                     | 32,000  | 90                      | 32,000  | 60                      | 32,000                               | 42                      |
| R 0.1                 | 40,000                               | 360                     | 32,000  | 240                     | 32,000  | 240                     | 32,000                               | 240                     |
| R0.2                  | 40,000                               | 588                     | 32,000  | 492                     | 32,000  | 396                     | 32,000                               | 246                     |
| R0.3                  | 40,000                               | 696                     | 32,000  | 588                     | 32,000  | 504                     | 32,000                               | 318                     |
| R0.4                  | 40,000                               | 792                     | 32,000  | 660                     | 31,500  | 504                     | 27,500                               | 348                     |
| R0.5                  | 32,000                               | 900                     | 31,500  | 744                     | 25,000  | 480                     | 22,000                               | 342                     |
| R1                    | 19,000                               | 900                     | 15,500  | 744                     | 12,500  | 480                     | 11,000                               | 348                     |
| R1.5                  | 12,500                               | 912                     | 10,500  | 756                     | 8,450   | 486                     | 7,400                                | 348                     |
| R2                    | 9,500                                | 912                     | 7,950   | 756                     | 6,350   | 534                     | 5,550                                | 444                     |
| R3                    | 6,300                                | 960                     | 5,300   | 804                     | 4,200   | 558                     | 3,700                                | 468                     |
| R4                    | 4,750                                | 1,140                   | 3,950   | 948                     | 3,150   | 666                     | 2,750                                | 546                     |
| R5                    | 3,800                                | 1,068                   | 3,150   | 894                     | 2,500   | 630                     | 2,200                                | 516                     |
| R6                    | 3,170                                | 1,008                   | 2,650   | 840                     | 2,100   | 588                     | 1,850                                | 516                     |
| R8                    | 2,400                                | 756                     | 1,990   | 630                     | 1,580   | 444                     | 1,390                                | 390                     |
| R10                   | 1,900                                | 600                     | 1,590   | 504                     | 1,260   | 348                     | 1,110                                | 312                     |

|                      |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|
| DEPTH OF CUT<br>加工深度 |  |  |  |  |  |  |
|----------------------|--|--|--|--|--|--|

## ● P-SSB/P-MSB/P-SB 4 Flutes HIGH-SPEED LIGHT Milling P-SSB/P-MSB/P-SB 4刃 高速切削

| WORK MATERIAL<br>被切削材 | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-----------------------|--------------------------------------|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                       |                                      |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| R                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| R 0.5                 | 50,000                               | 4,020                   | 50,000  | 3,360                   | 50,000  | 3,000                   | 47,500                               | 2,700                   |
| R1                    | 31,500                               | 4,020                   | 25,000  | 3,360                   | 24,500  | 3,000                   | 23,500                               | 2,700                   |
| R1.5                  | 21,000                               | 4,020                   | 16,500  | 3,360                   | 16,000  | 3,000                   | 15,500                               | 2,700                   |
| R2                    | 15,500                               | 4,896                   | 15,500  | 4,080                   | 15,000  | 3,300                   | 13,500                               | 2,940                   |
| R3                    | 10,500                               | 6,192                   | 13,500  | 5,160                   | 11,500  | 3,300                   | 9,500                                | 2,700                   |
| R4                    | 7,900                                | 4,608                   | 10,000  | 3,840                   | 8,950   | 2,520                   | 7,150                                | 2,040                   |
| R5                    | 6,300                                | 3,744                   | 8,250   | 3,120                   | 7,150   | 2,040                   | 5,700                                | 1,620                   |
| R6                    | 5,250                                | 3,096                   | 6,850   | 2,580                   | 5,950   | 1,680                   | 4,750                                | 1,320                   |
| R8                    | 4,950                                | 1,860                   | 4,110   | 1,548                   | 4,460   | 1,260                   | 3,560                                | 984                     |
| R10                   | 3,950                                | 1,488                   | 3,290   | 1,236                   | 3,570   | 1,008                   | 2,850                                | 792                     |

|                      |  |  |  |  |
|----------------------|--|--|--|--|
| DEPTH OF CUT<br>加工深度 |  |  |  |  |
|----------------------|--|--|--|--|

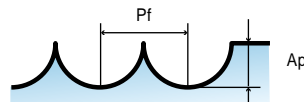


產品規格表 **P66-67**  
Specification page

### • P-LNBT 2 Flutes Regular Milling P-LNBT 2刃 標準切削

| WORK MATERIAL<br>被切削材 |    | COPPER, ALUMINUM ALLOY<br>銅、鋁合       |                         |                      |       | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         |                      |       | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                      |       |                                      |                         |                      |       |
|-----------------------|----|--------------------------------------|-------------------------|----------------------|-------|---|-------------------------|----------------------|-------|---|-------------------------|----------------------|-------|--------------------------------------|-------------------------|----------------------|-------|
|                       |    | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度 |       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度 |       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度 |       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | DEPTH OF CUT<br>加工深度 |       |
| Ap                    | Pf |                                      |                         | Ap                   | Pf    |   |                         | Ap                   | Pf    |   |                         | Ap                   | Pf    |                                      |                         |                      |       |
| 0.25                  | 2  | 32,000                               | 480                     | 0.040                | 0.050 | 32,000  | 320                     | 0.020                | 0.025 | 32,000  | 240                     | 0.020                | 0.020 | 32,000                               | 240                     | 0.010                | 0.010 |
|                       | 4  | 27,000                               | 360                     | 0.040                | 0.050 | 27,000  | 240                     | 0.020                | 0.025 | 27,000  | 160                     | 0.020                | 0.020 | 27,000                               | 160                     | 0.010                | 0.010 |
|                       | 6  | 21,000                               | 240                     | 0.020                | 0.030 | 20,000  | 160                     | 0.010                | 0.015 | 20,000  | 120                     | 0.010                | 0.010 | 20,000                               | 120                     | 0.010                | 0.010 |
| 0.30                  | 2  | 32,000                               | 540                     | 0.045                | 0.120 | 32,000  | 360                     | 0.030                | 0.060 | 32,000  | 240                     | 0.030                | 0.050 | 32,000                               | 240                     | 0.030                | 0.030 |
|                       | 4  | 30,000                               | 300                     | 0.045                | 0.120 | 25,000  | 200                     | 0.030                | 0.060 | 24,000  | 160                     | 0.030                | 0.040 | 24,000                               | 160                     | 0.030                | 0.030 |
|                       | 6  | 25,000                               | 180                     | 0.045                | 0.120 | 20,000  | 120                     | 0.030                | 0.060 | 20,000  | 120                     | 0.030                | 0.040 | 20,000                               | 120                     | 0.020                | 0.020 |
| 0.40                  | 4  | 27,000                               | 540                     | 0.060                | 0.160 | 23,000  | 360                     | 0.040                | 0.080 | 21,000  | 240                     | 0.040                | 0.060 | 21,000                               | 240                     | 0.040                | 0.040 |
|                       | 6  | 24,000                               | 300                     | 0.060                | 0.120 | 21,000  | 200                     | 0.040                | 0.080 | 19,000  | 160                     | 0.040                | 0.050 | 19,000                               | 160                     | 0.020                | 0.025 |
|                       | 8  | 22,000                               | 180                     | 0.060                | 0.120 | 19,000  | 120                     | 0.040                | 0.060 | 17,000  | 120                     | 0.040                | 0.050 | 17,000                               | 120                     | 0.020                | 0.025 |
| 0.50                  | 6  | 21,000                               | 360                     | 0.075                | 0.200 | 19,000  | 240                     | 0.050                | 0.100 | 16,000  | 160                     | 0.050                | 0.080 | 16,000                               | 160                     | 0.050                | 0.050 |
|                       | 8  | 21,000                               | 360                     | 0.075                | 0.150 | 19,000  | 240                     | 0.050                | 0.075 | 16,000  | 160                     | 0.050                | 0.060 | 16,000                               | 160                     | 0.030                | 0.030 |
|                       | 10 | 18,000                               | 240                     | 0.060                | 0.120 | 17,000  | 160                     | 0.030                | 0.050 | 14,000  | 120                     | 0.030                | 0.040 | 14,000                               | 120                     | 0.010                | 0.015 |
|                       | 12 | 18,000                               | 240                     | 0.060                | 0.120 | 17,000  | 160                     | 0.030                | 0.050 | 14,000  | 120                     | 0.030                | 0.040 | 14,000                               | 120                     | 0.010                | 0.015 |
| 0.60                  | 6  | 20,000                               | 360                     | 0.090                | 0.240 | 17,000  | 240                     | 0.060                | 0.120 | 14,000  | 160                     | 0.060                | 0.100 | 14,000                               | 160                     | 0.060                | 0.060 |
|                       | 8  | 20,000                               | 360                     | 0.090                | 0.240 | 17,000  | 240                     | 0.060                | 0.120 | 14,000  | 160                     | 0.060                | 0.100 | 14,000                               | 160                     | 0.060                | 0.060 |
|                       | 10 | 20,000                               | 360                     | 0.090                | 0.180 | 17,000  | 240                     | 0.060                | 0.090 | 14,000  | 160                     | 0.060                | 0.070 | 14,000                               | 160                     | 0.030                | 0.030 |
|                       | 12 | 16,000                               | 240                     | 0.090                | 0.180 | 14,000  | 160                     | 0.060                | 0.090 | 11,000  | 120                     | 0.060                | 0.070 | 11,000                               | 120                     | 0.030                | 0.030 |
| 0.70                  | 16 | 13,000                               | 240                     | 0.090                | 0.180 | 12,000  | 160                     | 0.060                | 0.090 | 9,000   | 120                     | 0.040                | 0.070 | 9,000                                | 120                     | 0.010                | 0.030 |
| 0.75                  | 6  | 18,000                               | 600                     | 0.120                | 0.300 | 15,000  | 400                     | 0.080                | 0.150 | 12,000  | 280                     | 0.080                | 0.120 | 12,000                               | 240                     | 0.080                | 0.100 |
|                       | 8  | 17,000                               | 360                     | 0.120                | 0.300 | 15,000  | 240                     | 0.080                | 0.150 | 12,000  | 200                     | 0.080                | 0.120 | 12,000                               | 200                     | 0.080                | 0.100 |
|                       | 10 | 17,000                               | 360                     | 0.120                | 0.300 | 15,000  | 240                     | 0.080                | 0.150 | 12,000  | 200                     | 0.080                | 0.120 | 12,000                               | 200                     | 0.080                | 0.100 |
|                       | 12 | 17,000                               | 360                     | 0.120                | 0.240 | 15,000  | 240                     | 0.080                | 0.120 | 12,000  | 200                     | 0.080                | 0.090 | 12,000                               | 200                     | 0.050                | 0.060 |
|                       | 14 | 17,000                               | 360                     | 0.120                | 0.240 | 15,000  | 240                     | 0.080                | 0.120 | 12,000  | 200                     | 0.080                | 0.090 | 12,000                               | 200                     | 0.050                | 0.060 |
|                       | 16 | 13,000                               | 240                     | 0.090                | 0.180 | 12,000  | 160                     | 0.060                | 0.010 | 9,500   | 120                     | 0.060                | 0.070 | 9,500                                | 120                     | 0.010                | 0.030 |
|                       | 18 | 13,000                               | 240                     | 0.090                | 0.180 | 12,000  | 160                     | 0.060                | 0.010 | 9,500   | 120                     | 0.060                | 0.070 | 9,500                                | 120                     | 0.010                | 0.030 |
| 0.80                  | 20 | 13,000                               | 240                     | 0.090                | 0.180 | 12,000  | 160                     | 0.060                | 0.010 | 9,500   | 120                     | 0.060                | 0.070 | 9,500                                | 120                     | 0.010                | 0.030 |
|                       | 8  | 16,500                               | 360                     | 0.120                | 0.320 | 14,000  | 240                     | 0.080                | 0.160 | 11,000  | 200                     | 0.080                | 0.130 | 11,000                               | 200                     | 0.080                | 0.100 |
|                       | 12 | 16,500                               | 360                     | 0.120                | 0.240 | 14,000  | 240                     | 0.080                | 0.120 | 11,000  | 200                     | 0.080                | 0.080 | 11,000                               | 200                     | 0.050                | 0.050 |
|                       | 16 | 11,500                               | 240                     | 0.120                | 0.240 | 11,000  | 160                     | 0.080                | 0.120 | 9,000   | 120                     | 0.080                | 0.080 | 9,000                                | 120                     | 0.050                | 0.050 |
| 0.90                  | 20 | 11,500                               | 240                     | 0.090                | 0.200 | 11,000  | 160                     | 0.060                | 0.120 | 9,000   | 120                     | 0.060                | 0.075 | 9,000                                | 120                     | 0.015                | 0.030 |
|                       | 8  | 16,500                               | 480                     | 0.130                | 0.360 | 14,000  | 320                     | 0.090                | 0.180 | 11,000  | 240                     | 0.090                | 0.160 | 11,000                               | 240                     | 0.090                | 0.120 |
|                       | 20 | 11,000                               | 240                     | 0.100                | 0.220 | 11,000  | 160                     | 0.060                | 0.130 | 8,000   | 160                     | 0.060                | 0.080 | 8,000                                | 160                     | 0.020                | 0.030 |
| 1.00                  | 8  | 14,000                               | 840                     | 0.150                | 0.560 | 16,500  | 400                     | 0.100                | 0.280 | 10,000  | 240                     | 0.100                | 0.280 | 10,000                               | 240                     | 0.100                | 0.200 |
|                       | 10 | 14,000                               | 600                     | 0.150                | 0.560 | 13,000  | 400                     | 0.100                | 0.280 | 10,000  | 240                     | 0.100                | 0.280 | 10,000                               | 240                     | 0.100                | 0.200 |
|                       | 12 | 14,000                               | 600                     | 0.150                | 0.560 | 13,000  | 400                     | 0.100                | 0.280 | 10,000  | 240                     | 0.100                | 0.280 | 10,000                               | 240                     | 0.100                | 0.200 |
|                       | 14 | 14,000                               | 600                     | 0.150                | 0.560 | 13,000  | 400                     | 0.100                | 0.280 | 10,000  | 240                     | 0.100                | 0.280 | 10,000                               | 240                     | 0.100                | 0.200 |
|                       | 16 | 14,000                               | 600                     | 0.150                | 0.420 | 13,000  | 400                     | 0.100                | 0.210 | 10,000  | 240                     | 0.100                | 0.180 | 10,000                               | 240                     | 0.060                | 0.100 |
|                       | 18 | 14,000                               | 600                     | 0.150                | 0.420 | 13,000  | 400                     | 0.100                | 0.210 | 10,000  | 240                     | 0.100                | 0.180 | 10,000                               | 240                     | 0.060                | 0.100 |
|                       | 20 | 11,000                               | 300                     | 0.150                | 0.420 | 10,000  | 200                     | 0.100                | 0.210 | 8,000   | 160                     | 0.100                | 0.180 | 8,000                                | 160                     | 0.060                | 0.100 |
| 1.25                  | 20 | 12,000                               | 480                     | 0.180                | 0.560 | 10,000  | 320                     | 0.120                | 0.280 | 8,500   | 240                     | 0.120                | 0.200 | 8,500                                | 240                     | 0.080                | 0.150 |
| 1.50                  | 12 | 10,000                               | 720                     | 0.200                | 0.840 | 9,500   | 480                     | 0.150                | 0.420 | 7,500   | 320                     | 0.150                | 0.360 | 7,500                                | 320                     | 0.150                | 0.300 |
|                       | 16 | 10,000                               | 360                     | 0.200                | 0.840 | 8,500   | 240                     | 0.150                | 0.420 | 6,500   | 200                     | 0.150                | 0.360 | 6,500                                | 200                     | 0.150                | 0.300 |
|                       | 20 | 10,000                               | 360                     | 0.200                | 0.840 | 8,500   | 240                     | 0.150                | 0.420 | 6,500   | 200                     | 0.150                | 0.360 | 6,500                                | 200                     | 0.150                | 0.300 |
|                       | 25 | 10,000                               | 360                     | 0.200                | 0.840 | 8,500   | 240                     | 0.150                | 0.420 | 6,500   | 200                     | 0.150                | 0.300 | 6,500                                | 200                     | 0.090                | 0.150 |
| 2.00                  | 12 | 9,000                                | 720                     | 0.500                | 1.280 | 7,500   | 480                     | 0.200                | 0.640 | 6,000   | 320                     | 0.200                | 0.600 | 6,000                                | 320                     | 0.200                | 0.400 |
|                       | 16 | 9,000                                | 720                     | 0.500                | 1.280 | 7,500   | 480                     | 0.200                | 0.640 | 6,000   | 320                     | 0.200                | 0.600 | 6,000                                | 320                     | 0.200                | 0.400 |
|                       | 20 | 7,000                                | 480                     | 0.500                | 1.280 | 6,000   | 320                     | 0.200                | 0.640 | 5,000   | 200                     | 0.200                | 0.600 | 5,000                                | 200                     | 0.200                | 0.400 |
|                       | 25 | 7,000                                | 480                     | 0.500                | 1.280 | 6,000   | 320                     | 0.200                | 0.640 | 5,000   | 200                     | 0.200                | 0.600 | 5,000                                | 200                     | 0.200                | 0.400 |
|                       | 30 | 7,000                                | 480                     | 0.400                | 1.280 | 6,000   | 320                     | 0.200                | 0.640 | 5,000   | 200                     | 0.200                | 0.560 | 5,000                                | 200                     | 0.120                | 0.200 |

DEPTH OF CUT  
加工深度



產品規格表 **P68**

Specification page

## ● P-PBTA 2 Flutes Standard Cutting Conditons 標準切削

| Working material hardness<br>被切削材硬度 | HRC45~52               |                     | HRC52~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      |
| PBTA0101T                           | 8800                   | 260                 | 7920                   | 234                 |
| PBTA0151T                           | 6900                   | 190                 | 4950                   | 171                 |
| PBTA0201T                           | 5600                   | 420                 | 5040                   | 378                 |
| PBTA0205T                           | 5600                   | 420                 | 4320                   | 378                 |
| PBTA0301T                           | 7200                   | 380                 | 6480                   | 342                 |
| PBTA0305T                           | 7200                   | 380                 | 6480                   | 342                 |
| PBTA0401T                           | 7200                   | 380                 | 6480                   | 342                 |
| PBTA0405T                           | 5400                   | 300                 | 4860                   | 270                 |
| PBTA0605T                           | 9728                   | 1280                | 7040                   | 768                 |
| PBTA0603T                           | 9728                   | 1216                | 6400                   | 704                 |
| PBTA0805T                           | 5120                   | 1536                | 3200                   | 832                 |
| PBTA0803T                           | 5120                   | 1152                | 2048                   | 640                 |

產品規格表 **P69-70**

Specification page

## ● P-TBTA 2 Flutes Standard Cutting Conditons 標準切削

| WORK MATERIAL<br>被切削材 | Carbon Steels S50C<br>碳素鋼            |                               | Alloy Steels<br>Prehardened Steels<br>SCM SKD HPM NAK<br>合金鋼、調質鋼 |                               | Hardened Steels<br>SKD61~HRC50<br>調質鋼 |                               | Aluminum<br>鋁                        |                               | Copper<br>銅                          |                               |
|-----------------------|--------------------------------------|-------------------------------|--|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 150m/min                             |                               | 120~150m/min   |                               | 80~100m/min                           |                               | 150~m/min                            |                               | 100~150m/min                         |                               |
| Shank<br>柄徑(mm)       | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                             | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 |
| 4                     | 12,000                               | 930                           | 10,000   | 570                           | 7,200                                 | 450                           | 24,000                               | 2,400                         | 12,000                               | 1,200                         |
| 6                     | 8,000                                | 930                           | 6,400  | 540                           | 4,800                                 | 450                           | 16,000                               | 2,400                         | 8,000                                | 1,200                         |
| 8                     | 6,000                                | 900                           | 4,800  | 540                           | 3,600                                 | 450                           | 12,000                               | 2,400                         | 6,000                                | 1,200                         |
| 10                    | 4,800                                | 900                           | 3,800  | 540                           | 2,900                                 | 450                           | 9,600                                | 2,300                         | 4,800                                | 1,150                         |

| DEPTH OF CUT<br>加工深度 | 0.1XR (~45HRC)<br>-0.08XR (~50HRC) |  | (R0.1~0.5=0.2XR)<br>0.3XR |  | -0.16XR R <sub>z</sub> ≤0.3 (~45HRC)<br>-0.25XR R <sub>z</sub> ≤3 (~45HRC)<br>-0.17XR R <sub>z</sub> ≤4 (~45HRC)<br>-0.05XR (~50HRC) |  |
|----------------------|------------------------------------|--|---------------------------|--|--|--|
|                      |                                    |  |                           |  |  |  |

P-RTA

產品規格表 **P71-72**

Specification page

P-LRTA

產品規格表 **P75**

Specification page

## ● P-RTA/P-LRTA 2 Flutes Slotting P-RTA/P-LRTA 2刃 溝銑切削

| WORK MATERIAL<br>被切削材   | COPPER, ALUMINUM ALLOY<br>銅、鋁合金      |                         | MILD STEELS, CARBON STEELS,<br>SS400、S55C、FC250、NAK55<br>一般構造用鋼、碳素鋼 |                         | HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS<br>SKT、SKD61、NAK80、HPM1、DH<br>調質鋼、預硬鋼、不鏽鋼 |                         |                                      |                         |
|-------------------------|--------------------------------------|-------------------------|---|-------------------------|---|-------------------------|--------------------------------------|-------------------------|
|                         |                                      |                         | ~32HRC  |                         | HRC33~41  |                         | HRC42~50                             |                         |
| MILL DIA.<br>(mm)<br>直徑 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | FEED<br>(mm/min)<br>進給速 |
| 2                       | 24,000                               | 248                     | 9,700   | 104                     | 7,000   | 72                      | 6,300                                | 56                      |
| 3                       | 16,000                               | 320                     | 6,900   | 136                     | 5,300   | 80                      | 4,400                                | 60                      |
| 4                       | 12,000                               | 360                     | 5,400   | 168                     | 4,200   | 100                     | 3,500                                | 72                      |
| 5                       | 9,500                                | 432                     | 4,800   | 216                     | 3,500   | 104                     | 3,000                                | 80                      |
| 6                       | 7,900                                | 424                     | 4,000   | 216                     | 2,900   | 104                     | 2,500                                | 80                      |
| 8                       | 5,900                                | 416                     | 3,000   | 208                     | 2,200   | 100                     | 1,900                                | 80                      |
| 10                      | 4,700                                | 400                     | 2,400   | 200                     | 1,700   | 100                     | 1,500                                | 76                      |
| 12                      | 4,000                                | 408                     | 2,000   | 200                     | 1,400   | 100                     | 1,200                                | 76                      |

|                      |  |  |
|----------------------|--|--|
| DEPTH OF CUT<br>加工深度 |  |  |
|----------------------|--|--|

P-RTA

產品規格表 **P73-74**

Specification page

P-LRTA

產品規格表 **P76**

Specification page

## • P-RTA/P-LRTA 4 Flutes Slotting P-RTA/P-LRTA 4刃 溝銑切削

| MILL DIA.<br>(mm)<br>直徑 | MILD STEELS,<br>CARBON STEELS,<br>CAST IRON<br>SS400、S55C、<br>FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、<br>碳素鋼、鑄鐵 |                         | ALLOY STEELS,<br>TOOL STEELS<br>SCM、SKT、SKS、<br>SKD<br>~HRC30合金鋼、<br>工具鋼 |                         | HARDENED<br>STEELS,<br>PREHARDENED<br>STEELS<br>SKT、SKD、<br>NAK55、HPM1<br>HRC30~38<br>調質鋼、預硬鋼 |                         | STAINLESS<br>STEELS,<br>HARDENED<br>STEELS<br>SUS304、SKD<br>HRC38~45<br>不鏽鋼、調質鋼 |                         | HARDENED<br>STEELS, TITANIUM<br>ALLOY STEELS<br>HRC45~55<br>調質鋼、鈦合金 |                         | HEAT RESISTANT<br>ALLOY STEELS<br>INCONEL<br>耐熱合金鋼、<br>高鎳合金 |                         |
|-------------------------|--|-------------------------|--|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|---|-------------------------|
|                         | SPEED<br>(min <sup>-1</sup> )<br>迴轉速   | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                     | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                                | FEED<br>(mm/min)<br>進給速 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                        | FEED<br>(mm/min)<br>進給速 |
| 3                       | 10,500   | 584                     | 8,550  | 544                     | 7,850   | 416                     | 7,450   | 368                     | 7,200   | 352                     | 2,500   | 100                     |
| 4                       | 7,750  | 584                     | 6,400  | 620                     | 5,900   | 416                     | 5,550   | 412                     | 5,400   | 396                     | 1,900   | 108                     |
| 5                       | 6,200  | 588                     | 5,100  | 604                     | 4,700   | 436                     | 4,450   | 436                     | 4,300   | 428                     | 1,500   | 116                     |
| 6                       | 5,150  | 592                     | 4,250  | 508                     | 3,950   | 460                     | 3,700   | 456                     | 3,600   | 436                     | 1,250   | 116                     |
| 8                       | 3,850  | 480                     | 3,200  | 440                     | 2,950   | 440                     | 2,800   | 420                     | 2,700   | 408                     | 945   | 124                     |
| 10                      | 3,100  | 464                     | 2,550  | 432                     | 2,350   | 384                     | 2,250   | 380                     | 2,150   | 364                     | 760   | 116                     |
| 12                      | 2,600  | 448                     | 2,150  | 380                     | 1,950   | 368                     | 1,850   | 352                     | 1,800   | 348                     | 630   | 116                     |
| DEPTH OF CUT<br>加工深度    |  |                         |  |                         |   |                         |   |                         |   |                         |   |                         |

產品規格表 **P82-83**  
Specification page

## ● P-UMIE 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter<br>D          | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D0.2                                | 25000                  | 144                 | 22500                  | 130                 |
| D0.3                                | 25000                  | 171                 | 22500                  | 154                 |
| D0.4                                | 25000                  | 189                 | 22500                  | 170                 |
| D0.5                                | 25000                  | 216                 | 22500                  | 194                 |
| D0.6                                | 25000                  | 216                 | 22500                  | 194                 |
| D0.7                                | 23000                  | 252                 | 20700                  | 227                 |
| D0.8                                | 21500                  | 270                 | 19350                  | 243                 |
| D0.9                                | 20000                  | 324                 | 18000                  | 292                 |



**Attention :** In order to get better cutting surface and lengthen the life-time of the end mill, please use high accuracy, high rigidity and dynamic equilibrium of holder.

請特別注意：為了得到較佳之切削表面及延長刀具壽命，請務必使用高精度、高剛性、動平衡佳之刀把夾治具。

1. Before using the end mill, please examine the end mill to lean towards and put, when the precision of the leaning towards of end mill exceeds 0.01mm, please cut after correcting.
2. It is better that end mill stretches out shorter from chuck, when the end mill stretches out longer, please adjust the rotational speed, feeding speed or cutting amount.
3. Unusual vibrations or sound happen when cutting, please adjust and lower the rotational speed of the main shaft one by one, feeding speed and cutting amount until improving the situation, or change the high-quality end mill.
4. It is the best way to cool steel material by spraying or air in order to make nBS efficiently; we commend to adopt non-water cutting liquid to cool the stainless steel, titanium alloy or heat-resisting alloy.
5. Cutting will be influenced by work piece, machine and software; the above-mentioned data are only for reference, please improve feeding speed by 30%~50% up after cutting situation steadily.

1. 使用本刀具前請測刀具偏擺，刀具之偏擺精度超過0.01mm時，請改正後再進行切削。
2. 刀具伸出夾頭之長度越短越好，刀具之伸出量若伸出較長時，請自行調降轉速、進給速度或切削量。
3. 在切削中如果產生異常之震動或聲音時，請逐一調降主軸轉速，進給速度與切削量至情況改善為止，或更換高品質刀把。
4. 鋼料冷卻以噴霧式或噴氣式為最佳選用方式，以使nBS發揮最佳效果，不鏽鋼鈦合金或耐熱合金建議採用非水溶性切削液。
5. 切削方式依工件、機器、軟件之影響，以上之數據僅供參考，待切削狀況穩定後再將進給速度往上提高 30%-50%。

產品規格表 **P84**  
Specification page

## ● P-UET 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D1.0                                | 11500                  | 384                 | 8896                   | 288                 | 6720                   | 243                 |
| D1.5                                | 10800                  | 480                 | 8250                   | 380                 | 6400                   | 290                 |
| D2.0                                | 9472                   | 448                 | 8192                   | 384                 | 5760                   | 320                 |
| D2.5                                | 9100                   | 500                 | 8050                   | 420                 | 5600                   | 320                 |
| D3.0                                | 7680                   | 550                 | 7150                   | 480                 | 4992                   | 320                 |
| D3.5                                | 7200                   | 610                 | 6850                   | 520                 | 4680                   | 350                 |
| D4.0                                | 6950                   | 680                 | 6350                   | 580                 | 4480                   | 350                 |
| D4.5                                | 6660                   | 700                 | 6100                   | 600                 | 4500                   | 360                 |
| D5.0                                | 6400                   | 700                 | 5850                   | 600                 | 4310                   | 360                 |
| D5.5                                | 6200                   | 750                 | 5900                   | 650                 | 4100                   | 380                 |
| D6.0                                | 6200                   | 750                 | 5900                   | 650                 | 3900                   | 380                 |
| D6.5                                | 6000                   | 800                 | 5700                   | 710                 | 3800                   | 410                 |
| D7.0                                | 5900                   | 850                 | 5000                   | 760                 | 3700                   | 420                 |
| D7.5                                | 5900                   | 850                 | 4600                   | 760                 | 3600                   | 420                 |
| D8.0                                | 4500                   | 950                 | 2880                   | 800                 | 1850                   | 470                 |
| D8.5                                | 4100                   | 1020                | 2450                   | 900                 | 1750                   | 500                 |
| D10.0                               | 2900                   | 1400                | 1500                   | 750                 | 1100                   | 380                 |
| D10.5                               | 2800                   | 1400                | 1350                   | 680                 | 1000                   | 350                 |
| D11.0                               | 2700                   | 1300                | 1250                   | 500                 | 950                    | 300                 |
| D11.5                               | 2600                   | 1300                | 1100                   | 450                 | 850                    | 250                 |
| D12.0                               | 2450                   | 1000                | 1020                   | 420                 | 790                    | 210                 |
| D12.5                               | 2100                   | 900                 | 950                    | 380                 | 680                    | 200                 |
| D13.0                               | 1800                   | 700                 | 870                    | 350                 | 620                    | 180                 |
| D14.0                               | 1680                   | 650                 | 740                    | 320                 | 570                    | 170                 |
| D15.0                               | 1500                   | 600                 | 700                    | 320                 | 520                    | 170                 |
| D16.0                               | 1400                   | 600                 | 670                    | 300                 | 490                    | 170                 |
| D17.0                               | 1300                   | 600                 | 630                    | 290                 | 450                    | 170                 |
| D18.0                               | 1190                   | 550                 | 580                    | 270                 | 430                    | 160                 |
| D19.0                               | 1050                   | 550                 | 490                    | 250                 | 395                    | 150                 |
| D20.0                               | 920                    | 550                 | 440                    | 210                 | 310                    | 120                 |
| D25.0                               | 780                    | 400                 | 380                    | 165                 | 280                    | 120                 |

產品規格表 **P85**  
Specification page

## ● P-UET 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D1.0                                | 13800                  | 461                 | 10675                  | 346                 | 8064                   | 292                 |
| D1.5                                | 12960                  | 576                 | 9900                   | 456                 | 7680                   | 348                 |
| D2.0                                | 11366                  | 538                 | 9830                   | 461                 | 6912                   | 384                 |
| D2.5                                | 10920                  | 600                 | 9660                   | 504                 | 6720                   | 384                 |
| D3.0                                | 9216                   | 660                 | 8580                   | 576                 | 5990                   | 384                 |
| D3.5                                | 8640                   | 732                 | 8220                   | 624                 | 5616                   | 420                 |
| D4.0                                | 8340                   | 816                 | 7620                   | 696                 | 5376                   | 420                 |
| D4.5                                | 7992                   | 840                 | 7320                   | 720                 | 5400                   | 432                 |
| D5.0                                | 7680                   | 840                 | 7020                   | 720                 | 5172                   | 432                 |
| D5.5                                | 7440                   | 900                 | 7080                   | 780                 | 4920                   | 456                 |
| D6.0                                | 7440                   | 900                 | 7080                   | 780                 | 4680                   | 456                 |
| D6.5                                | 7200                   | 960                 | 6840                   | 852                 | 4560                   | 492                 |
| D7.0                                | 7080                   | 1020                | 6000                   | 912                 | 4440                   | 504                 |
| D7.5                                | 7080                   | 1020                | 5520                   | 912                 | 4320                   | 504                 |
| D8.0                                | 5400                   | 1140                | 3456                   | 960                 | 2220                   | 564                 |
| D8.5                                | 4920                   | 1224                | 2940                   | 1080                | 2100                   | 600                 |
| D10.0                               | 3480                   | 1680                | 1800                   | 900                 | 1320                   | 456                 |
| D10.5                               | 3360                   | 1680                | 1620                   | 816                 | 1200                   | 420                 |
| D11.0                               | 3240                   | 1560                | 1500                   | 600                 | 1140                   | 360                 |
| D11.5                               | 3120                   | 1560                | 1320                   | 540                 | 1020                   | 300                 |
| D12.0                               | 2940                   | 1200                | 1224                   | 504                 | 948                    | 252                 |
| D12.5                               | 2520                   | 1080                | 1140                   | 456                 | 816                    | 240                 |
| D13.0                               | 2160                   | 840                 | 1044                   | 420                 | 744                    | 216                 |
| D14.0                               | 2016                   | 780                 | 888                    | 384                 | 684                    | 204                 |
| D15.0                               | 1800                   | 720                 | 840                    | 384                 | 624                    | 204                 |
| D16.0                               | 1680                   | 720                 | 804                    | 360                 | 588                    | 204                 |
| D17.0                               | 1560                   | 720                 | 756                    | 348                 | 540                    | 204                 |
| D18.0                               | 1428                   | 660                 | 696                    | 324                 | 516                    | 192                 |
| D19.0                               | 1260                   | 660                 | 588                    | 300                 | 474                    | 180                 |
| D20.0                               | 1104                   | 660                 | 528                    | 252                 | 372                    | 144                 |
| D25.0                               | 936                    | 480                 | 456                    | 198                 | 336                    | 144                 |

**P-ULET**

 產品規格表 **P86**  
 Specification page

**SULET**

 產品規格表 **P200**  
 Specification page

**• P-ULET,SULET 2 Flutes Standard Cutting Conditions 標準切削**

| Work Material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼·合金鋼 ~HRC30 |                               |               | Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼·工具鋼HRC30~45 |                               |               | Austenitic stainless steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                               |               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                               |               |
|-----------------------|--|-------------------------------|---------------|--|-------------------------------|---------------|---|-------------------------------|---------------|---|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 30~50m/min   |                               |               | 30~40m/min   |                               |               | 20~30m/min  |                               |               | 15~25m/min  |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數                                      | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |  | Side Milling<br>側面            | Slotting<br>溝 |  | Side Milling<br>側面            | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |
| 1                     | 13,000   | 60                            | 60            | 9,500  | 45                            | 45            | 8,000   | 35                            | 35            | 6,400   | 25                            | 25            |
| 1.5                   | 8,500  | 60                            | 60            | 6,400  | 45                            | 45            | 5,300   | 35                            | 35            | 4,200   | 25                            | 25            |
| 2                     | 6,400  | 60                            | 60            | 4,800  | 45                            | 45            | 4,000   | 35                            | 35            | 3,200   | 25                            | 25            |
| 2.5                   | 5,100  | 60                            | 60            | 3,800  | 45                            | 45            | 3,200   | 40                            | 40            | 2,500   | 25                            | 25            |
| 3                     | 4,200  | 65                            | 60            | 3,400  | 55                            | 45            | 2,600   | 40                            | 40            | 2,100   | 25                            | 25            |
| 4                     | 3,400  | 80                            | 60            | 2,700  | 65                            | 45            | 2,100   | 50                            |               | 1,700   | 35                            | 25            |
|                       |  |                               |               |  |                               |               | 1,600   |                               | 30            |   |                               |               |
| 5                     | 2,900  | 100                           | 60            | 2,300  | 80                            | 45            | 1,800   | 60                            |               | 1,500   | 40                            | 25            |
|                       |  |                               |               |  |                               |               | 1,350   |                               | 30            |   |                               |               |
| 6                     | 2,500  | 120                           | 60            | 2,000  | 100                           | 50            | 1,500   | 75                            |               | 1,300   | 50                            | 25            |
|                       |  |                               |               |  |                               |               | 1,100   |                               | 30            |   |                               |               |
| 8                     | 1,900  | 130                           | 60            | 1,500  | 100                           | 50            | 1,200   | 80                            |               | 1,000   | 50                            | 25            |
|                       |  |                               |               |  |                               |               | 900   |                               | 30            |   |                               |               |
| 10                    | 1,600  | 130                           | 60            | 1,300  | 100                           | 50            | 950   | 75                            |               | 800   | 50                            | 25            |
|                       |  |                               |               |  |                               |               | 710   |                               | 30            |   |                               |               |
| 12                    | 1,300  | 120                           | 60            | 1,100  | 100                           | 50            | 800   | 75                            |               | 670   | 50                            | 25            |
|                       |  |                               |               |  |                               |               | 600   |                               | 30            |   |                               |               |
| 16                    | 1,000  | 80                            | 40            | 820  | 65                            | 30            | 600   | 45                            |               | 500   | 30                            | 15            |
|                       |  |                               |               |  |                               |               | 450   |                               | 20            |   |                               |               |
| 20                    | 800  | 65                            | 30            | 650  | 50                            | 25            | 480   | 40                            |               | 400   | 25                            | 13            |
|                       |  |                               |               |  |                               |               | 360   |                               | 15            |   |                               |               |
| 25                    | 650  | 50                            | 25            | 520  | 40                            | 20            | 380   | 30                            |               | 320   | 20                            | 10            |
|                       |  |                               |               |  |                               |               | 280   |                               | 12            |   |                               |               |

|                                    |  |  |  |  |
|------------------------------------|--|--|--|--|
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 |  |  |  |  |
|------------------------------------|--|--|--|--|

1. Please use SI coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

1. 切削 50~60 HRC 以上之材料時，請使用 SI 鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
3. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之 1/3 以下。



**P-ULET**

產品規格表 **P87**  
Specification page

**SULET**

產品規格表 **P201**  
Specification page

**SUSL**

產品規格表 **P247**  
Specification page

## ● P-ULET,SULET,SUSL 4 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels,<br>Alloy SteelsS50C, SCM,<br>鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼,<br>合金鋼-HRC30 |                               |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened Steels,<br>AISI H13<br>合金鋼, 工具鋼 |                               |               | Austenitic stainless Steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                               |               | Hardened Steels<br>SKD61, SKD11, NAK,<br>STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                               |               | Non is essential please<br>don't attempt<br>Hardened Steels<br>SKD11等<br>AISI D2<br>[非必要請勿嘗試]<br>熱處理鋼(HRC50~60) |                               |               |
|-----------------------|---|-------------------------------|---------------|--|-------------------------------|---------------|---|-------------------------------|---------------|--|-------------------------------|---------------|---|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 35~50m/min  |                               |               | 30~40m/min   |                               |               | 20~30m/min  |                               |               | 15~25m/min   |                               |               | 15~20m/min  |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |   | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |
| 1                     | 11,000  | 85                            | 40            | 9,500  | 65                            | 30            | 8,000   | 50                            |               | 6,400  | 35                            | 17            | 4,800   | 20                            | 10            |
| 1.5                   | 7,400   | 85                            | 40            | 6,400  | 90                            | 45            | 5,300   | 50                            |               | 4,200  | 35                            | 17            | 3,200   | 20                            | 10            |
|                       |   |                               |               |  |                               |               | 4,240   |                               | 20            |  |                               |               |   |                               |               |
| 2                     | 5,600   | 85                            | 40            | 4,800  | 90                            | 45            | 4,000   | 50                            |               | 3,200  | 35                            | 17            | 2,400   | 20                            | 10            |
|                       |   |                               |               |  |                               |               | 3,200   |                               | 20            |  |                               |               |   |                               |               |
| 2.5                   | 4,500   | 85                            | 40            | 3,800  | 90                            | 45            | 3,200   | 55                            |               | 2,500  | 35                            | 17            | 2,100   | 20                            | 10            |
|                       |   |                               |               |  |                               |               | 2,560   |                               | 22            |  |                               |               |   |                               |               |
| 3                     | 4,200   | 100                           | 50            | 3,400  | 90                            | 45            | 2,600   | 60                            |               | 2,100  | 35                            | 17            | 1,800   | 25                            | 12            |
|                       |   |                               |               |  |                               |               | 2,080   |                               | 24            |  |                               |               |   |                               |               |
| 4                     | 3,400   | 125                           | 60            | 2,700  | 90                            | 45            | 2,100   | 70                            |               | 1,700  | 50                            | 25            | 1,400   | 30                            | 15            |
|                       |   |                               |               |  |                               |               | 1,680   |                               | 28            |  |                               |               |   |                               |               |
| 5                     | 2,900   | 155                           | 75            | 2,300  | 110                           | 55            | 1,800   | 85                            |               | 1,500  | 55                            | 27            | 1,200   | 35                            | 17            |
|                       |   |                               |               |  |                               |               | 1,440   |                               | 34            |  |                               |               |   |                               |               |
| 6                     | 2,500   | 180                           | 90            | 2,000  | 140                           | 70            | 1,500   | 110                           |               | 1,300  | 70                            | 35            | 1,000   | 40                            | 20            |
|                       |   |                               |               |  |                               |               | 1,200   |                               | 44            |  |                               |               |   |                               |               |
| 8                     | 1,900   | 200                           | 100           | 1,500  | 140                           | 70            | 1,200   | 110                           |               | 1,000  | 70                            | 35            | 800   | 40                            | 20            |
|                       |   |                               |               |  |                               |               | 960   |                               | 44            |  |                               |               |   |                               |               |
| 10                    | 1,600   | 205                           | 100           | 1,300  | 140                           | 70            | 950   | 110                           |               | 800  | 70                            | 35            | 650   | 40                            | 20            |
|                       |   |                               |               |  |                               |               | 760   |                               | 44            |  |                               |               |   |                               |               |
| 12                    | 1,300   | 180                           | 90            | 1,100  | 140                           | 70            | 800   | 110                           |               | 670  | 70                            | 35            | 530   | 40                            | 20            |
|                       |   |                               |               |  |                               |               | 640   |                               | 44            |  |                               |               |   |                               |               |
| 16                    | 1,000   | 120                           | 60            | 820  | 100                           | 50            | 600   | 80                            |               | 500  | 50                            | 25            | 400   | 30                            | 15            |
|                       |   |                               |               |  |                               |               | 480   |                               | 32            |  |                               |               |   |                               |               |
| 20                    | 800   | 95                            | 45            | 650  | 75                            | 35            | 480   | 70                            |               | 400  | 40                            | 20            | 320   | 25                            | 12            |
|                       |   |                               |               |  |                               |               | 384   |                               | 28            |  |                               |               |   |                               |               |
| 25                    | 650   | 75                            | 35            | 520  | 60                            | 30            | 380   | 50                            |               | 320  | 35                            | 17            | 250   | 20                            | 10            |
|                       |   |                               |               |  |                               |               | 280   |                               | 20            |  |                               |               |   |                               |               |

Depth of cut  
(D:直徑Dia)  
切削量基準

- In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
- If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- When drilling, please set the feed rate at 1/3 or below of the above value.

- 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
- 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
- 縱向進給時，進給速度請設定為上表之 1/3 以下。

產品規格表 **P88**  
Specification page

| ● P-UVT Multi Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度         | HRC30~ 50              |                     | HRC50~ 55°             |                     |
|   | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Diameter<br>D 值                             | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0  | 14040                  | 1498                | 6760                   | 749                 |
| D4.0  | 10920                  | 1778                | 5200                   | 842                 |
| D5.0  | 9360                   | 2013                | 4628                   | 983                 |
| D6.0  | 8320                   | 2714                | 4160                   | 1358                |
| D8.0  | 4640                   | 2714                | 2400                   | 1358                |
| D10.0                                       | 3360                   | 2668                | 2000                   | 1358                |
| D12.0                                       | 2480                   | 2246                | 1520                   | 1123                |
| D16.0                                       | 1440                   | 1685                | 1080                   | 842                 |
| D20.0                                       | 612                    | 576                 | 504                    | 456                 |
| D25.0                                       | 468                    | 360                 | 342                    | 216                 |

產品規格表 **P89**  
Specification page

| ● P-ULVT Long Flutes Multi Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|--|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度                      | HRC30~ 50              |                     | HRC50~ 55°             |                     |
|  | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Diameter<br>D 值  | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0   | 5200                   | 599                 | 62704                  | 300                 |
| D4.0   | 4640                   | 711                 | 2080                   | 337                 |
| D5.0   | 3360                   | 805                 | 1851                   | 393                 |
| D6.0   | 3080                   | 1086                | 1664                   | 543                 |
| D8.0   | 2240                   | 1086                | 1248                   | 543                 |
| D10.0  | 1800                   | 1067                | 998                    | 543                 |
| D12.0  | 1320                   | 899                 | 832                    | 449                 |
| D16.0  | 680                    | 570                 | 624                    | 337                 |
| D20.0  | 510                    | 480                 | 420                    | 380                 |
| D25.0  | 390                    | 300                 | 285                    | 180                 |

P-ULNT

產品規格表 **P90**  
Specification page

P-SFULNT

產品規格表 **P126**  
Specification page

## ● P-ULNT,P-SFULNT2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D1.6-14                             | 19904                  | 796                 | 15924                  | 637                 |
| D1.6-16                             | 18909                  | 756                 | 15127                  | 605                 |
| D1.6-18                             | 17964                  | 719                 | 14371                  | 575                 |
| D1.6-20                             | 17066                  | 683                 | 13652                  | 546                 |
| D1.8-8                              | 17693                  | 708                 | 14154                  | 566                 |
| D1.8-14                             | 16808                  | 672                 | 13447                  | 538                 |
| D1.8-20                             | 15968                  | 639                 | 12774                  | 511                 |
| D2-6                                | 15924                  | 637                 | 12739                  | 510                 |
| D2-8                                | 15127                  | 605                 | 12102                  | 484                 |
| D2-10                               | 14371                  | 575                 | 11497                  | 460                 |
| D2-12                               | 13652                  | 546                 | 10922                  | 437                 |
| D2-14                               | 12970                  | 519                 | 10376                  | 415                 |
| D2-16                               | 12321                  | 493                 | 9857                   | 394                 |
| D2-18                               | 11705                  | 468                 | 9364                   | 375                 |
| D2-20                               | 11120                  | 445                 | 8896                   | 356                 |
| D2.5-8                              | 12739                  | 637                 | 10191                  | 510                 |
| D2.5-12                             | 12102                  | 605                 | 9682                   | 484                 |
| D2.5-16                             | 11497                  | 575                 | 9197                   | 460                 |
| D2.5-20                             | 10922                  | 546                 | 8738                   | 437                 |
| D3-8                                | 10616                  | 531                 | 8493                   | 425                 |
| D3-12                               | 10085                  | 504                 | 8068                   | 403                 |
| D3-16                               | 9581                   | 479                 | 7665                   | 383                 |
| D3-20                               | 9102                   | 455                 | 7281                   | 364                 |
| D3-25                               | 8647                   | 432                 | 6917                   | 346                 |
| D3.5-12                             | 9099                   | 546                 | 7279                   | 437                 |
| D3.5-16                             | 8644                   | 519                 | 6915                   | 415                 |
| D3.5-20                             | 8212                   | 493                 | 6570                   | 394                 |
| D3.5-25                             | 7801                   | 468                 | 6241                   | 374                 |
| D3.5-30                             | 7411                   | 445                 | 5929                   | 356                 |
| D4-12                               | 7962                   | 478                 | 6369                   | 382                 |
| D4-16                               | 7564                   | 454                 | 6051                   | 363                 |
| D4-20                               | 7186                   | 431                 | 5748                   | 345                 |
| D4-25                               | 6826                   | 410                 | 5461                   | 328                 |
| D4-30                               | 6485                   | 389                 | 5188                   | 311                 |
| D4-35                               | 6161                   | 370                 | 4929                   | 296                 |

產品規格表 **P90-91**  
Specification page

## • P-ULNT 3 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D1.6-14                             | 19904                  | 1194                | 15924                  | 955                 |
| D1.6-16                             | 18909                  | 1135                | 15127                  | 908                 |
| D1.6-18                             | 17964                  | 1078                | 14371                  | 862                 |
| D1.6-20                             | 17066                  | 1024                | 13652                  | 819                 |
| D1.8-8                              | 17693                  | 1062                | 14154                  | 849                 |
| D1.8-14                             | 16808                  | 1008                | 13447                  | 807                 |
| D1.8-20                             | 15968                  | 958                 | 12774                  | 766                 |
| D2-6                                | 15924                  | 955                 | 12739                  | 764                 |
| D2-8                                | 15127                  | 908                 | 12102                  | 726                 |
| D2-10                               | 14371                  | 862                 | 11497                  | 690                 |
| D2-12                               | 13652                  | 819                 | 10922                  | 655                 |
| D2-14                               | 12970                  | 778                 | 10376                  | 623                 |
| D2-16                               | 12321                  | 739                 | 9857                   | 591                 |
| D2-18                               | 11705                  | 702                 | 9364                   | 562                 |
| D2-20                               | 11120                  | 667                 | 8896                   | 534                 |
| D2.5-8                              | 12739                  | 955                 | 10191                  | 764                 |
| D2.5-12                             | 12102                  | 908                 | 9682                   | 726                 |
| D2.5-16                             | 11497                  | 862                 | 9197                   | 690                 |
| D2.5-20                             | 10922                  | 819                 | 8738                   | 655                 |
| D3-8                                | 10616                  | 796                 | 8493                   | 637                 |
| D3-12                               | 10085                  | 756                 | 8068                   | 605                 |
| D3-16                               | 9581                   | 719                 | 7665                   | 575                 |
| D3-20                               | 9102                   | 683                 | 7281                   | 546                 |
| D3-25                               | 8647                   | 648                 | 6917                   | 519                 |
| D3.5-12                             | 9099                   | 819                 | 7279                   | 655                 |
| D3.5-16                             | 8644                   | 778                 | 6915                   | 622                 |
| D3.5-20                             | 8212                   | 739                 | 6570                   | 591                 |
| D3.5-25                             | 7801                   | 702                 | 6241                   | 562                 |
| D3.5-30                             | 7411                   | 667                 | 5929                   | 534                 |
| D4-12                               | 7962                   | 717                 | 6369                   | 573                 |
| D4-16                               | 7564                   | 681                 | 6051                   | 545                 |
| D4-20                               | 7186                   | 647                 | 5748                   | 517                 |
| D4-25                               | 6826                   | 614                 | 5461                   | 491                 |
| D4-30                               | 6485                   | 584                 | 5188                   | 467                 |
| D4-35                               | 6161                   | 554                 | 4929                   | 444                 |

Unit/單位: mm

產品規格表 **P92-93**

Specification page

## ● P-UMIB 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Radius of Ball Nose<br>R 徑          | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.15R                              | 25000                  | 200                 | 25000                  | 198                 |
| D0.2R                               | 25000                  | 275                 | 25000                  | 248                 |
| D0.25R                              | 25000                  | 330                 | 25000                  | 297                 |
| D0.3R                               | 25000                  | 418                 | 25000                  | 376                 |
| D0.35R                              | 25000                  | 495                 | 25000                  | 446                 |
| D0.4R                               | 25000                  | 561                 | 25000                  | 505                 |
| D0.45R                              | 25000                  | 638                 | 25000                  | 574                 |



**Attention :** In order to get better cutting surface and lengthen the life-time of the end mill, please use high accuracy, high rigidity and dynamic equilibrium of holder.

請特別注意：為了得到較佳之切削表面及延長刀具壽命，請務必使用高精度、高剛性、動平衡佳之刀把夾治具。

1. Before using the end mill, please examine the end mill to lean towards and put, when the precision of the leaning towards of end mill exceeds 0.01mm, please cut after correcting.
  2. It is better that end mill stretches out shorter from chuck, when the end mill stretches out longer, please adjust the rotational speed, feeding speed or cutting amount.
  3. Unusual vibrations or sound happen when cutting, please adjust and lower the rotational speed of the main shaft one by one, feeding speed and cutting amount until improving the situation, or change the high-quality end mill.
  4. It is the best way to cool steel material by spraying or air in order to make nBS efficiently; we commend to adopt non-water cutting liquid to cool the stainless steel, titanium alloy or heat-resisting alloy.
  5. Cutting will be influenced by work piece, machine and software; the above-mentioned data are only for reference, please improve feeding speed by 30%~50% up after cutting situation steadily.
1. 使用本刀具前請測刀具偏擺，刀具之偏擺精度超過0.01mm時，請改正後再進行切削。
  2. 刀具伸出夾頭之長度越短越好，刀具之伸出量若伸出較長時，請自行調降轉速、進給速度或切削量。
  3. 在切削中如果產生異常之震動或聲音時，請逐一調降主軸轉速，進給速度與切削量至情況改善為止，或更換高品質刀把。
  4. 鋼料冷卻以噴霧式或噴氣式為最佳選用方式，以使 nBS發揮最佳效果，不鏽鋼鈦合金或耐熱合金建議採用非水溶性切削液。
  5. 切削方式依工件、機器、軟件之影響，以上之數據僅供參考，待切削狀況穩定後再將進給速度往上提高 30%-50%。

產品規格表 **P94**

Specification page

## ● P-UBT 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC52                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                               | 20480                  | 768                 | 16640                  | 512                 | 13440                  | 486                 |
| D0.75R                              | 19500                  | 820                 | 15700                  | 680                 | 12700                  | 560                 |
| D1.0R                               | 18944                  | 896                 | 14272                  | 742                 | 11520                  | 640                 |
| D1.25R                              | 17000                  | 1060                | 12800                  | 950                 | 10500                  | 640                 |
| D1.5R                               | 15360                  | 1408                | 11520                  | 1024                | 9984                   | 640                 |
| D2.0R                               | 14720                  | 2048                | 10880                  | 960                 | 8960                   | 870                 |
| D2.5R                               | 13800                  | 2560                | 9984                   | 1280                | 7040                   | 768                 |
| D3.0R                               | 12800                  | 2560                | 9728                   | 1216                | 6400                   | 704                 |
| D3.5R                               | 9300                   | 2680                | 6800                   | 1420                | 4500                   | 780                 |
| D4.0R                               | 8320                   | 2816                | 5120                   | 1536                | 3200                   | 832                 |
| D4.5R                               | 6590                   | 2600                | 4100                   | 1380                | 2800                   | 750                 |
| D5.0R                               | 4864                   | 2432                | 2560                   | 1152                | 2048                   | 640                 |
| D6.0R                               | 3800                   | 2300                | 2560                   | 1280                | 1536                   | 576                 |
| D7.0R                               | 2200                   | 1250                | 1580                   | 690                 | 980                    | 420                 |
| D8.0R                               | 1650                   | 780                 | 1050                   | 520                 | 700                    | 360                 |
| D10.0R                              | 1100                   | 600                 | 680                    | 410                 | 490                    | 245                 |
| D12.5R                              | 860                    | 500                 | 530                    | 260                 | 385                    | 190                 |

## P-UBT / P-ULBT

產品規格表 **P95**

Specification page

## ● P-UBT,P-ULBT 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | HRC52                  |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                               | 18432                  | 691                 | 14976                  | 461                 | 12096                  | 438                 |
| D0.75R                              | 17550                  | 738                 | 14130                  | 612                 | 11430                  | 504                 |
| D1.0R                               | 17050                  | 806                 | 12845                  | 668                 | 10368                  | 576                 |
| D1.25R                              | 15300                  | 954                 | 11520                  | 855                 | 9450                   | 576                 |
| D1.5R                               | 13824                  | 1267                | 10368                  | 922                 | 8986                   | 576                 |
| D2.0R                               | 13248                  | 1843                | 9792                   | 864                 | 8064                   | 783                 |
| D2.5R                               | 12420                  | 2304                | 8986                   | 1152                | 6336                   | 691                 |
| D3.0R                               | 11520                  | 2304                | 8755                   | 1094                | 5760                   | 634                 |
| D3.5R                               | 8370                   | 2412                | 6120                   | 1278                | 4050                   | 702                 |
| D4.0R                               | 7488                   | 2534                | 4608                   | 1382                | 2880                   | 749                 |
| D4.5R                               | 5931                   | 2340                | 3690                   | 1241                | 2520                   | 675                 |
| D5.0R                               | 4378                   | 2189                | 2304                   | 1037                | 1843                   | 576                 |
| D6.0R                               | 3420                   | 2070                | 2304                   | 1152                | 1382                   | 518                 |
| D7.0R                               | 1980                   | 1125                | 1422                   | 621                 | 882                    | 378                 |
| D8.0R                               | 1485                   | 702                 | 945                    | 468                 | 630                    | 324                 |
| D10.0R                              | 990                    | 540                 | 612                    | 369                 | 441                    | 221                 |
| D12.5R                              | 774                    | 450                 | 477                    | 234                 | 347                    | 171                 |

產品規格表 **P96**  
Specification page

| ● P-UBTSX 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度       | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|   | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|   | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                                     | 20480                  | 768                 | 16640                  | 512                 | 13440                  | 486                 |
| D0.75R                                    | 19500                  | 820                 | 15700                  | 680                 | 12700                  | 560                 |
| D1.0R                                     | 18944                  | 896                 | 14272                  | 742                 | 11520                  | 640                 |
| D1.25R                                    | 17000                  | 1060                | 12800                  | 950                 | 10500                  | 640                 |
| D1.5R                                     | 15360                  | 1408                | 11520                  | 1024                | 9984                   | 640                 |
| D2.0R                                     | 14720                  | 2048                | 10880                  | 960                 | 8960                   | 870                 |
| D2.5R                                     | 13800                  | 2560                | 9984                   | 1280                | 7040                   | 768                 |
| D3.0R                                     | 12800                  | 2560                | 9728                   | 1216                | 6400                   | 704                 |
| D3.5R                                     | 9300                   | 2680                | 6800                   | 1420                | 4500                   | 780                 |
| D4.0R                                     | 8320                   | 2816                | 5120                   | 1536                | 3200                   | 832                 |
| D4.5R                                     | 6590                   | 2600                | 4100                   | 1380                | 2800                   | 750                 |
| D5.0R                                     | 4864                   | 2432                | 2560                   | 1152                | 2048                   | 640                 |
| D6.0R                                     | 3800                   | 2300                | 2560                   | 1280                | 1536                   | 576                 |
| D7.0R                                     | 2200                   | 1250                | 1580                   | 690                 | 980                    | 420                 |
| D8.0R                                     | 1650                   | 780                 | 1050                   | 520                 | 700                    | 360                 |
| D10.0R                                    | 1100                   | 600                 | 680                    | 410                 | 490                    | 245                 |
| D12.5R                                    | 860                    | 500                 | 530                    | 260                 | 385                    | 190                 |

產品規格表 **P97**  
Specification page

| ● P-ULBTS & P-ULBTM & P-ULBTL 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度                           | ~HRC30                 |                     | ~HRC52                 |                     | ~HRC60                 |                     |
|   | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|   | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R   | 20480                  | 768                 | 16640                  | 512                 | 13440                  | 486                 |
| D0.75R  | 19500                  | 820                 | 15700                  | 680                 | 12700                  | 560                 |
| D1.0R   | 18944                  | 896                 | 14272                  | 742                 | 11520                  | 640                 |
| D1.25R  | 17000                  | 1060                | 12800                  | 950                 | 10500                  | 640                 |
| D1.5R   | 15360                  | 1408                | 11520                  | 1024                | 9984                   | 640                 |
| D2.0R   | 14720                  | 2048                | 10880                  | 960                 | 8960                   | 870                 |
| D2.5R   | 13800                  | 2560                | 9984                   | 1280                | 7040                   | 768                 |
| D3.0R   | 12800                  | 2560                | 9728                   | 1216                | 6400                   | 704                 |
| D3.5R   | 9300                   | 2680                | 6800                   | 1420                | 4500                   | 780                 |
| D4.0R   | 8320                   | 2816                | 5120                   | 1536                | 3200                   | 832                 |
| D4.5R   | 6590                   | 2600                | 4100                   | 1380                | 2800                   | 750                 |
| D5.0R   | 4864                   | 2432                | 2560                   | 1152                | 2048                   | 640                 |
| D6.0R   | 3800                   | 2300                | 2560                   | 1280                | 1536                   | 576                 |
| D7.0R   | 2200                   | 1250                | 1580                   | 690                 | 980                    | 420                 |
| D8.0R   | 1650                   | 780                 | 1050                   | 520                 | 700                    | 360                 |
| D10.0R  | 1100                   | 600                 | 680                    | 410                 | 490                    | 245                 |
| D12.5R  | 860                    | 500                 | 530                    | 260                 | 385                    | 190                 |

**P-ULNBT**

產品規格表 **P98-99**  
Specification page

**P-SFULNBT**

產品規格表 **P134-135**  
Specification page

## ● P-ULNBT,P-SFULNBT 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.25 - 2                           | 25000                  | 250                 | 22500                  | 225                 |
| D0.25 - 4                           | 23000                  | 220                 | 20700                  | 198                 |
| D0.25 - 6                           | 17500                  | 200                 | 15750                  | 180                 |
| D0.3 - 2                            | 25000                  | 320                 | 22500                  | 288                 |
| D0.3 - 4                            | 23000                  | 250                 | 20700                  | 252                 |
| D0.3 - 6                            | 17500                  | 220                 | 15750                  | 198                 |
| D0.4 - 4                            | 18000                  | 400                 | 16200                  | 360                 |
| D0.4 - 6                            | 17000                  | 380                 | 15300                  | 342                 |
| D0.4 - 8                            | 16000                  | 300                 | 14400                  | 270                 |
| D0.5 - 6                            | 12000                  | 420                 | 10800                  | 378                 |
| D0.5 - 8                            | 10500                  | 330                 | 9450                   | 297                 |
| D0.5 - 10                           | 9300                   | 300                 | 8370                   | 270                 |
| D0.5 - 12                           | 8800                   | 260                 | 7920                   | 234                 |
| D0.6 - 6                            | 11500                  | 420                 | 10350                  | 378                 |
| D0.6 - 8                            | 9800                   | 330                 | 8820                   | 297                 |
| D0.6 - 10                           | 8500                   | 300                 | 7650                   | 270                 |
| D0.6 - 12                           | 7800                   | 260                 | 7020                   | 234                 |
| D0.7 - 6                            | 10500                  | 520                 | 9450                   | 468                 |
| D0.7 - 10                           | 9500                   | 380                 | 8550                   | 342                 |
| D0.7 - 16                           | 8300                   | 290                 | 7470                   | 261                 |
| D0.75 - 6                           | 13000                  | 600                 | 11700                  | 540                 |
| D0.75 - 8                           | 11000                  | 550                 | 9900                   | 495                 |
| D0.75 - 10                          | 9900                   | 470                 | 8910                   | 423                 |
| D0.75 - 12                          | 8800                   | 390                 | 7920                   | 351                 |
| D0.75 - 14                          | 8100                   | 280                 | 7290                   | 252                 |
| D0.75 - 16                          | 7800                   | 200                 | 7020                   | 180                 |
| D0.75 - 18                          | 6900                   | 190                 | 6210                   | 171                 |
| D0.75 - 20                          | 5500                   | 190                 | 4950                   | 171                 |
| D0.8 - 6                            | 13000                  | 600                 | 11700                  | 540                 |
| D0.8 - 8                            | 11000                  | 550                 | 9900                   | 495                 |
| D0.8 - 10                           | 9900                   | 470                 | 8910                   | 423                 |
| D0.8 - 12                           | 8800                   | 390                 | 7920                   | 351                 |



P-ULNBT

產品規格表 **P98-99**

Specification page

P-SFULNBT

產品規格表 **P134-135**

Specification page

## ● P-ULNBT,P-SFULNBT 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| Diameter-efficiency length<br>刃徑-有效 |                        |                     |                        |                     |
| D0.8 - 14                           | 8100                   | 280                 | 7290                   | 252                 |
| D0.8 - 16                           | 7800                   | 200                 | 7020                   | 180                 |
| D0.8 - 18                           | 6900                   | 190                 | 6210                   | 171                 |
| D0.8 - 20                           | 5500                   | 190                 | 4950                   | 171                 |
| D0.9 - 8                            | 12000                  | 750                 | 10800                  | 675                 |
| D0.9 - 14                           | 8500                   | 670                 | 7650                   | 603                 |
| D0.9 - 20                           | 7200                   | 320                 | 6480                   | 288                 |
| D1 - 8                              | 11000                  | 800                 | 9900                   | 720                 |
| D1 - 10                             | 8500                   | 730                 | 7650                   | 657                 |
| D1 - 12                             | 7900                   | 680                 | 7110                   | 412                 |
| D1 - 14                             | 6600                   | 650                 | 5940                   | 585                 |
| D1 - 16                             | 6100                   | 520                 | 5490                   | 468                 |
| D1 - 18                             | 5600                   | 420                 | 5040                   | 378                 |
| D1 - 20                             | 4800                   | 300                 | 4320                   | 270                 |
| D1.25 - 8                           | 11000                  | 850                 | 9900                   | 765                 |
| D1.25 - 12                          | 7900                   | 710                 | 7100                   | 639                 |
| D1.25 - 16                          | 6100                   | 640                 | 5490                   | 576                 |
| D1.25 - 20                          | 4800                   | 420                 | 4320                   | 378                 |
| D1.5 - 10                           | 13000                  | 850                 | 11700                  | 765                 |
| D1.5 - 12                           | 12000                  | 650                 | 10800                  | 585                 |
| D1.5 - 16                           | 10600                  | 480                 | 9540                   | 411                 |
| D1.5 - 20                           | 9700                   | 400                 | 8730                   | 396                 |
| D1.5 - 25                           | 7200                   | 380                 | 6480                   | 342                 |
| D2 - 12                             | 12000                  | 650                 | 10800                  | 585                 |
| D2 - 16                             | 10600                  | 490                 | 9540                   | 441                 |
| D2 - 20                             | 9700                   | 440                 | 8730                   | 396                 |
| D2 - 25                             | 7200                   | 380                 | 6480                   | 342                 |
| D2 - 30                             | 5400                   | 300                 | 4860                   | 270                 |

產品規格表 **P100**  
Specification page

| ● P-UPBT 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|--|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度      | HRC45~ 52              |                     | HRC52~ 62              |                     |
|  | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Mode                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| UPBT101520                               | 8800                   | 260                 | 7920                   | 234                 |
| UPBT151520                               | 6900                   | 190                 | 4950                   | 171                 |
| UPBT201025                               | 5600                   | 420                 | 5040                   | 378                 |
| UPBT251025                               | 4800                   | 420                 | 4320                   | 378                 |
| UPBT301030                               | 7200                   | 380                 | 6480                   | 342                 |
| UPBT401035                               | 7200                   | 380                 | 6480                   | 342                 |
| UPBT402545                               | 5400                   | 300                 | 4860                   | 270                 |
| UPBT502550                               | 9984                   | 1280                | 7040                   | 768                 |
| UPBT603038                               | 9728                   | 1216                | 6400                   | 704                 |
| UPBT803038                               | 5120                   | 1536                | 3200                   | 832                 |
| UPBT904042                               | 2560                   | 1152                | 2048                   | 640                 |

產品規格表 **P101**  
Specification page

| ● P-ULPBT 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度       | HRC30~ 50              |                     | HRC50~ 55°             |                     |
|   | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| MODE<br>型號                                | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| ULPBT200560                               | 4800                   | 300                 | 4320                   | 270                 |
| ULPBT201060                               | 4800                   | 300                 | 4320                   | 270                 |
| ULPBT201560                               | 4800                   | 300                 | 4320                   | 270                 |
| ULPBT202057                               | 4800                   | 300                 | 4320                   | 270                 |
| ULPBT300560                               | 7200                   | 380                 | 6480                   | 342                 |
| ULPBT301060                               | 7200                   | 380                 | 6480                   | 342                 |
| ULPBT301557                               | 7200                   | 380                 | 6480                   | 342                 |
| ULPBT302043                               | 7200                   | 380                 | 6480                   | 342                 |
| ULPBT400560                               | 5400                   | 300                 | 4860                   | 270                 |
| ULPBT401507                               | 5400                   | 300                 | 4860                   | 270                 |
| ULPBT401538                               | 5400                   | 300                 | 4860                   | 270                 |
| ULPBT402029                               | 5400                   | 300                 | 4860                   | 270                 |

產品規格表 **P102-103**

Specification page

## ● P-URTA 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| Diameter × Radius<br>D × R          |                        |                     |                        |                     |                        |                     |
| D1.0 x 0.1R                         | 11088                  | 549                 | 8120                   | 364                 | 5488                   | 252                 |
| D1.0 x 0.2R                         | 11088                  | 549                 | 8120                   | 364                 | 5488                   | 252                 |
| D1.0 x 0.3R                         | 11088                  | 549                 | 8120                   | 364                 | 5488                   | 252                 |
| D1.5 x 0.2R                         | 9800                   | 672                 | 7728                   | 392                 | 4760                   | 280                 |
| D1.5 x 0.3R                         | 9800                   | 672                 | 7728                   | 392                 | 4760                   | 280                 |
| D2.0 x 0.1R                         | 8960                   | 840                 | 7056                   | 504                 | 4032                   | 280                 |
| D2.0 x 0.2R                         | 8960                   | 840                 | 7056                   | 504                 | 4032                   | 280                 |
| D2.0 x 0.3R                         | 8960                   | 840                 | 7056                   | 504                 | 4032                   | 280                 |
| D3.0 x 0.1R                         | 6370                   | 882                 | 4082                   | 588                 | 3675                   | 245                 |
| D3.0 x 0.2R                         | 6370                   | 882                 | 4802                   | 588                 | 3675                   | 245                 |
| D3.0 x 0.3R                         | 6370                   | 882                 | 4802                   | 588                 | 3675                   | 245                 |
| D4.0 x 0.2R                         | 6125                   | 980                 | 4557                   | 515                 | 3332                   | 245                 |
| D4.0 x 0.3R                         | 6125                   | 980                 | 4557                   | 515                 | 3332                   | 245                 |
| D2.0 x 0.5R                         | 7840                   | 588                 | 6370                   | 441                 | 4508                   | 294                 |
| D3.0 x 0.5R                         | 6370                   | 980                 | 4802                   | 735                 | 3675                   | 245                 |
| D4.0 x 0.5R                         | 6125                   | 980                 | 4557                   | 515                 | 3332                   | 245                 |
| D6.0 x 0.5R                         | 5635                   | 1470                | 4312                   | 980                 | 2254                   | 368                 |
| D8.0 x 0.5R                         | 4239                   | 1666                | 2622                   | 833                 | 1887                   | 402                 |
| D10.0 x 0.5R                        | 2695                   | 1372                | 1568                   | 539                 | 809                    | 284                 |
| D12.0 x 0.5R                        | 2279                   | 1421                | 1078                   | 466                 | 637                    | 260                 |
| D3.0 x 1R                           | 7326                   | 1127                | 5522                   | 845                 | 4226                   | 282                 |
| D4.0 x 1R                           | 7044                   | 1127                | 5241                   | 592                 | 3832                   | 282                 |
| D6.0 x 1R                           | 6480                   | 1691                | 4959                   | 1127                | 2592                   | 423                 |
| D8.0 x 1R                           | 4875                   | 1916                | 3015                   | 958                 | 2170                   | 462                 |
| D10.0 x 1R                          | 3099                   | 1568                | 1803                   | 620                 | 930                    | 327                 |
| D12.0 x 1R                          | 2621                   | 1634                | 1240                   | 698                 | 733                    | 299                 |
| D6.0 x 1.5R                         | 6762                   | 1764                | 5174                   | 1176                | 2705                   | 441                 |
| D8.0 x 1.5R                         | 5086                   | 1999                | 3146                   | 1000                | 2264                   | 482                 |
| D10.0 x 1.5R                        | 3234                   | 1646                | 1882                   | 647                 | 970                    | 341                 |
| D12.0 x 1.5R                        | 2734                   | 1705                | 1294                   | 559                 | 764                    | 312                 |
| D6.0 x 2R                           | 7326                   | 1911                | 5606                   | 1274                | 2930                   | 478                 |
| D8.0 x 2R                           | 5510                   | 2166                | 3408                   | 1083                | 2452                   | 522                 |
| D10.0 x 2R                          | 3504                   | 1784                | 2038                   | 701                 | 1051                   | 369                 |
| D12.0 x 2R                          | 2962                   | 1847                | 1401                   | 605                 | 828                    | 338                 |
| D8.0 x 3R                           | 5722                   | 2249                | 3539                   | 1125                | 2548                   | 542                 |
| D10.0 x 3R                          | 3638                   | 1852                | 2117                   | 728                 | 1092                   | 384                 |
| D12.0 x 3R                          | 3076                   | 1918                | 1455                   | 629                 | 860                    | 351                 |

產品規格表 **P104**  
Specification page

## ● P-URTA 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0 x 0.1R                         | 7280                   | 1008                | 5488                   | 672                 | 4200                   | 280                 |
| D3.0 x 0.2R                         | 7280                   | 1008                | 5488                   | 672                 | 4200                   | 280                 |
| D3.0 x 0.3R                         | 7280                   | 1008                | 5488                   | 672                 | 4200                   | 280                 |
| D4.0 x 0.2R                         | 7000                   | 1120                | 5208                   | 588                 | 3808                   | 280                 |
| D4.0 x 0.3R                         | 7000                   | 1120                | 5208                   | 588                 | 3808                   | 280                 |
| D3.0 x 0.5R                         | 7280                   | 1120                | 5488                   | 840                 | 4200                   | 280                 |
| D4.0 x 0.5R                         | 7000                   | 1120                | 5208                   | 588                 | 3808                   | 280                 |
| D6.0 x 0.5R                         | 6440                   | 1680                | 4928                   | 1120                | 2576                   | 420                 |
| D8.0 x 0.5R                         | 4844                   | 1904                | 2996                   | 952                 | 2156                   | 459                 |
| D10.0 x 1R                          | 3080                   | 1568                | 1792                   | 616                 | 924                    | 325                 |
| D12.0 x 1R                          | 2604                   | 1624                | 1323                   | 532                 | 728                    | 297                 |
| D3.0 x 1R                           | 3872                   | 1288                | 6311                   | 966                 | 4830                   | 322                 |
| D4.0 x 1R                           | 8050                   | 1588                | 5989                   | 676                 | 4379                   | 322                 |
| D6.0 x 1R                           | 7406                   | 1932                | 5667                   | 1288                | 2962                   | 483                 |
| D8.0 x 1R                           | 5571                   | 2190                | 3446                   | 1095                | 2480                   | 528                 |
| D10.0 x 1R                          | 3541                   | 1792                | 2016                   | 708                 | 1063                   | 374                 |
| D12.0 x 1R                          | 2995                   | 1868                | 1417                   | 798                 | 837                    | 342                 |
| D6.0 x 1.5R                         | 7728                   | 2016                | 5914                   | 1344                | 3091                   | 504                 |
| D8.0 x 1.5R                         | 5813                   | 2285                | 3595                   | 1142                | 2587                   | 551                 |
| D10.0 x 1.5R                        | 3696                   | 1882                | 2150                   | 739                 | 1109                   | 390                 |
| D12.0 x 1.5R                        | 3125                   | 1949                | 1478                   | 638                 | 874                    | 356                 |
| D6.0 x 2R                           | 8372                   | 2184                | 6406                   | 1456                | 3349                   | 546                 |
| D8.0 x 2R                           | 6297                   | 2475                | 3895                   | 1238                | 2803                   | 597                 |
| D10.0 x 2R                          | 4004                   | 2038                | 2330                   | 801                 | 1201                   | 422                 |
| D12.0 x 2R                          | 3385                   | 2111                | 1602                   | 692                 | 946                    | 386                 |
| D8.0 x 2.5R                         | 6540                   | 2570                | 4045                   | 1285                | 2912                   | 620                 |
| D10.0 x 2.5R                        | 4158                   | 2117                | 2419                   | 832                 | 1248                   | 438                 |
| D12.0 x 2.5R                        | 3516                   | 2192                | 1663                   | 718                 | 983                    | 401                 |

產品規格表 **P105-106**  
Specification page

● P-UCRS 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                     |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|----------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速     | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter × Radius<br>D × R | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D1.0 x 0.1R                         | 15840                      | 784                 | 11600                  | 520                 | 7840                   | 360                 |
| D1.0 x 0.2R                         | 15840                      | 784                 | 11600                  | 520                 | 7840                   | 360                 |
| D1.0 x 0.3R                         | 15840                      | 784                 | 11600                  | 520                 | 7840                   | 360                 |
| D1.5 x 0.2R                         | 14000                      | 960                 | 11040                  | 560                 | 6800                   | 400                 |
| D1.5 x 0.3R                         | 14000                      | 960                 | 11040                  | 560                 | 6800                   | 400                 |
| D2.0 x 0.1R                         | 12800                      | 1200                | 10080                  | 720                 | 4760                   | 400                 |
| D2.0 x 0.2R                         | 12800                      | 1200                | 10080                  | 720                 | 5760                   | 400                 |
| D2.0 x 0.3R                         | 12800                      | 1200                | 10080                  | 720                 | 5760                   | 400                 |
| D3.0 x 0.1R                         | 9100                       | 1260                | 6860                   | 840                 | 5250                   | 350                 |
| D3.0 x 0.2R                         | 9100                       | 1260                | 6860                   | 840                 | 5250                   | 350                 |
| D3.0 x 0.3R                         | 9100                       | 1260                | 6860                   | 840                 | 5250                   | 350                 |
| D4.0 x 0.2R                         | 8750                       | 1400                | 6860                   | 735                 | 4760                   | 350                 |
| D4.0 x 0.3R                         | 8750                       | 1400                | 6510                   | 735                 | 4760                   | 350                 |
| D2.0 x 0.5R                         | 11200                      | 840                 | 9100                   | 630                 | 6440                   | 420                 |
| D3.0 x 0.5R                         | 9100                       | 1400                | 6860                   | 1050                | 5250                   | 350                 |
| D4.0 x 0.5R                         | 8750                       | 1400                | 6510                   | 735                 | 4760                   | 350                 |
| D6.0 x 0.5R                         | 8050                       | 2100                | 6160                   | 1400                | 3220                   | 525                 |
| D8.0 x 0.5R                         | 6055                       | 2380                | 3745                   | 1190                | 2695                   | 574                 |
| D10.0 x 0.5R                        | 3850                       | 1960                | 2240                   | 770                 | 1155                   | 406                 |
| D12.0 x 0.5R                        | 3255                       | 2030                | 1540                   | 665                 | 910                    | 371                 |
| D3.0 x 1R                           | 10465                      | 1610                | 7889                   | 1208                | 6038                   | 403                 |
| D4.0 x 1R                           | 10063                      | 1610                | 7487                   | 846                 | 5474                   | 403                 |
| D6.0 x 1R                           | 9258                       | 2415                | 7084                   | 1610                | 3703                   | 604                 |
| D8.0 x 1R                           | 6964                       | 2737                | 4307                   | 1369                | 3100                   | 660                 |
| D10.0 x 1R                          | 4428                       | 2240                | 2576                   | 886                 | 1329                   | 467                 |
| D12.0 x 1R                          | 3744                       | 2335                | 1771                   | 998                 | 1047                   | 427                 |
| D6.0 x 1.5R                         | 9660                       | 2520                | 7392                   | 1680                | 3864                   | 630                 |
| D8.0 x 1.5R                         | 7266                       | 2856                | 4494                   | 1428                | 3234                   | 689                 |
| D10.0 x 1.5R                        | 4620                       | 2352                | 2688                   | 924                 | 1386                   | 487                 |
| D12.0 x 1.5R                        | 3906                       | 2436                | 1848                   | 798                 | 1092                   | 445                 |
| D6.0 x 2R                           | 10465                      | 2730                | 8008                   | 1820                | 4186                   | 683                 |
| D8.0 x 2R                           | 7872                       | 3094                | 4869                   | 1547                | 3504                   | 746                 |
| D10.0 x 2R                          | 5005                       | 2548                | 2945                   | 1001                | 1502                   | 528                 |
| D12.0 x 2R                          | 4232                       | 2639                | 5005                   | 865                 | 1183                   | 482                 |
| D8.0 x 3R                           | 8175                       | 3213                | 5056                   | 1607                | 3640                   | 775                 |
| D10.0 x 3R                          | 5198                       | 2646                | 3024                   | 1040                | 1560                   | 548                 |
| D12.0 x 3R                          | 4395                       | 2741                | 2079                   | 898                 | 1229                   | 501                 |

產品規格表 **P107-108**  
Specification page

● P-UCRS 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0 x 0.1R                         | 10400                  | 1440                | 7840                   | 960                 | 6000                   | 400                 |
| D3.0 x 0.2R                         | 10400                  | 1440                | 7840                   | 960                 | 6000                   | 400                 |
| D3.0 x 0.3R                         | 10400                  | 1440                | 7840                   | 960                 | 6000                   | 400                 |
| D4.0 x 0.2R                         | 10000                  | 1600                | 7440                   | 840                 | 5440                   | 400                 |
| D4.0 x 0.3R                         | 10000                  | 1600                | 7440                   | 840                 | 5440                   | 400                 |
| D3.0 x 0.5R                         | 10400                  | 1600                | 7840                   | 1200                | 6000                   | 400                 |
| D4.0 x 0.5R                         | 10000                  | 1600                | 7440                   | 840                 | 5440                   | 400                 |
| D6.0 x 0.5R                         | 9200                   | 2400                | 7040                   | 1600                | 3680                   | 600                 |
| D8.0 x 0.5R                         | 6920                   | 2420                | 4280                   | 1360                | 3080                   | 656                 |
| D10.0 x 0.5R                        | 4400                   | 2240                | 2560                   | 880                 | 1320                   | 464                 |
| D12.0 x 0.5R                        | 3720                   | 2320                | 1760                   | 760                 | 1040                   | 424                 |
| D3.0 x 1R                           | 11960                  | 1840                | 9016                   | 1380                | 6900                   | 460                 |
| D4.0 x 1R                           | 11500                  | 1840                | 8556                   | 966                 | 6256                   | 460                 |
| D6.0 x 1R                           | 10580                  | 2760                | 8096                   | 1840                | 4232                   | 690                 |
| D8.0 x 1R                           | 7958                   | 3128                | 4922                   | 1564                | 3542                   | 754                 |
| D10.0 x1R                           | 5060                   | 2560                | 2944                   | 1012                | 1518                   | 534                 |
| D12.0 x 1R                          | 4278                   | 2668                | 2024                   | 1140                | 1196                   | 488                 |
| D6.0 x 1.5R                         | 11040                  | 2880                | 8448                   | 1920                | 4416                   | 720                 |
| D8.0 x 1.5R                         | 8304                   | 3264                | 5136                   | 1632                | 3696                   | 787                 |
| D10.0 x 1.5R                        | 5280                   | 2688                | 3072                   | 1056                | 1584                   | 557                 |
| D12.0 x 1.5R                        | 4464                   | 2784                | 2112                   | 912                 | 1248                   | 509                 |
| D6.0 x 2R                           | 11960                  | 3120                | 9152                   | 5080                | 4784                   | 780                 |
| D8.0 x 2R                           | 8996                   | 3536                | 5564                   | 1768                | 4004                   | 853                 |
| D10.0 x 2R                          | 5720                   | 2912                | 3328                   | 1144                | 1716                   | 603                 |
| D12.0 x 2R                          | 4836                   | 3016                | 2288                   | 988                 | 1352                   | 551                 |
| D8.0 x 3R                           | 9342                   | 3672                | 5778                   | 1836                | 4160                   | 886                 |
| D10.0 x 3R                          | 5940                   | 3024                | 3456                   | 1188                | 1782                   | 626                 |
| D12.0 x 3R                          | 5022                   | 3132                | 2376                   | 1026                | 1404                   | 573                 |

## ● P-UCR 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                 |                     | ~HRC50                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| MODE<br>型號                          |                        |                     |                        |                     |                        |                     |
| UCR0603-nBS                         | 7360                   | 1920                | 5700                   | 1280                | 3130                   | 510                 |
| UCR0605-nBS                         | 8280                   | 2160                | 6340                   | 1440                | 3310                   | 540                 |
| UCR0610-nBS                         | 9520                   | 2484                | 7290                   | 1660                | 3810                   | 620                 |
| UCR0803-nBS                         | 6230                   | 2448                | 3850                   | 1225                | 2780                   | 590                 |
| UCR0805-nBS                         | 6574                   | 2580                | 4066                   | 1290                | 2930                   | 623                 |
| UCR0810-nBS                         | 7560                   | 2972                | 4676                   | 1485                | 3365                   | 716                 |
| UCR1005-nBS                         | 4810                   | 2128                | 2432                   | 836                 | 1254                   | 440                 |
| UCR1010-nBS                         | 4810                   | 2432                | 2797                   | 960                 | 1442                   | 507                 |
| UCR1015-nBS                         | 5020                   | 2553                | 2918                   | 1003                | 1505                   | 530                 |
| UCR1020-nBS                         | 5434                   | 2766                | 3162                   | 1088                | 1630                   | 573                 |
| UCR1205-nBS                         | 3534                   | 2205                | 1675                   | 722                 | 990                    | 403                 |
| UCR1210-nBS                         | 4064                   | 2535                | 1923                   | 1083                | 1136                   | 464                 |
| UCR1215-nBS                         | 4240                   | 2645                | 2006                   | 1085                | 1186                   | 484                 |
| UCR1220-nBS                         | 4594                   | 2865                | 2174                   | 1087                | 1284                   | 524                 |



Attention : In order to get better cutting surface and lengthen the life-time of the end mill, please use high accuracy, high rigidity and dynamic equilibrium of holder.

請特別注意：為了得到較佳之切削表面及延長刀具壽命，請務必使用高精度、高剛性、動平衡佳之刀把夾治具。

1. Before using the end mill, please examine the end mill to lean towards and put, when the precision of the leaning towards of end mill exceeds 0.01mm, please cut after correcting.
  2. It is better that end mill stretches out shorter from chuck, when the end mill stretches out longer, please adjust the rotational speed, feeding speed or cutting amount.
  3. Unusual vibrations or sound happen when cutting, please adjust and lower the rotational speed of the main shaft one by one, feeding speed and cutting amount until improving the situation, or change the high-quality end mill.
  4. It is the best way to cool steel material by spraying or air in order to make nBS efficiently; we commend to adopt non-water cutting liquid to cool the stainless steel, titanium alloy or heat-resisting alloy.
  5. Cutting will be influenced by work piece, machine and software; the above-mentioned data are only for reference, please improve feeding speed by 30%~50% up after cutting situation steadily.
1. 使用本刀具前請測刀具偏擺，刀具之偏擺精度超過0.01mm時，請改正後再進行切削。
  2. 刀具伸出夾頭之長度越短越好，刀具之伸出量若伸出較長時，請自行調降轉速、進給速度或切削量。
  3. 在切削中如果產生異常之震動或聲音時，請逐一調降主軸轉速，進給速度與切削量至情況改善為止，或更換高品質刀把。
  4. 鋼料冷卻以噴霧式或噴氣式為最佳選用方式，以使 nBS 發揮最佳效果，不鏽鋼鈦合金或耐熱合金建議採用非水溶性切削液。
  5. 切削方式依工件、機器、軟件之影響，以上之數據僅供參考，待切削狀況穩定後再將進給速度往上提高 30%-50%。

PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page

PVB/PVBSX

產品規格表 **P113**  
Specification page

PVR

產品規格表 **P114**  
Specification page

● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Side Milling  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列側銑

| Side Milling       | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |           |               | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |         |               | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |               | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |               | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |               |
|--------------------|---|-----------|---------------|---|---------|---------------|---|---------|---------------|---|---------|---------------|---|---------|---------------|
|                    | ≤ 275   |           |               | ≤ 375   |         |               | ≤ 375   |         |               | > 375<br>≤ 475  |         |               | > 475<br>≤ 655  |         |               |
| Hardness BRINELL   | ≤ 275   |           |               | ≤ 375   |         |               | ≤ 375   |         |               | > 375<br>≤ 475  |         |               | > 475<br>≤ 655  |         |               |
| HRC                | ≤ 28.5  |           |               | ≤ 39.8  |         |               | ≤ 39.8  |         |               | > 39.8<br>≤ 49.1  |         |               | > 50<br>≤ 65  |         |               |
| Vc (SFM)           | 155   | (150-163) |               | 90  | (86-93) |               | 36  | (35-38) |               | 60  | (58-62) |               | 25  | (24-26) |               |
| Ae/Ap              | Ae=0.5D<br>Ap=1.5D  |           |               | Ae=0.5D<br>Ap=1.5D  |         |               | Ae=0.5D<br>Ap=1.5D                                      |         |               | Ae=0.5D<br>Ap=1.5D                                      |         |               | Ae=0.5D<br>Ap=1.5D                                      |         |               |
| MILL DIA. (Metric) | RPM   | Fz        | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes |
| 3                  | 15,962  | 0.01016   | 648.7         | 9,099   | 0.00762 | 277.33        | 3,729   | 0.01270 | 189           | 6,066   | 0.01016 | 246.5         | 2554  | 0.00508 | 51.9          |
| 4                  | 13,621  | 0.01397   | 761.2         | 7,764   | 0.00889 | 276.09        | 3,182   | 0.01715 | 218           | 5,176   | 0.01397 | 289.2         | 2179  | 0.00699 | 60.9          |
| 6                  | 9,081   | 0.02350   | 853.4         | 5,176   | 0.01842 | 381.28        | 2,121   | 0.02826 | 240           | 3,451   | 0.02350 | 324.3         | 1453  | 0.01175 | 68.3          |
| 8                  | 6,811   | 0.03683   | 1003.4        | 3,882   | 0.02794 | 433.86        | 1,591   | 0.04445 | 283           | 2,588   | 0.03683 | 381.3         | 1090  | 0.01842 | 80.3          |
| 10                 | 5,449   | 0.05017   | 1093.3        | 3,106   | 0.03715 | 461.47        | 1,273   | 0.06064 | 309           | 2,070   | 0.05017 | 415.5         | 872   | 0.02508 | 87.5          |
| 12                 | 4,540   | 0.05969   | 1084.1        | 2,588   | 0.04509 | 466.73        | 1,061   | 0.07176 | 304           | 1,725   | 0.05969 | 411.9         | 726   | 0.02985 | 86.7          |
| 16                 | 3,405   | 0.07874   | 1072.5        | 1,941   | 0.06096 | 473.31        | 795   | 0.09906 | 315           | 1,294   | 0.08128 | 420.7         | 545   | 0.04064 | 88.6          |
| 20                 | 2,956   | 0.08128   | 961.1         | 1,685   | 0.06350 | 427.97        | 691   | 0.10668 | 295           | 1,123   | 0.08890 | 399.4         | 473   | 0.04445 | 84.1          |
| 25                 | 2,078   | 0.08890   | 739.1         | 1,185   | 0.06858 | 324.99        | 486   | 0.12700 | 247           | 790   | 0.09652 | 304.9         | 333   | 0.04826 | 64.2          |

Depth of cut

The diagram illustrates the geometry of a side milling operation. It shows a blue L-shaped workpiece being machined. The vertical dimension of the cut is labeled as  $A_p$  (Depth of cut), and the horizontal dimension is labeled as  $A_e$  (Axial depth of cut).



PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page


PVB/PVBSX

產品規格表 **P113**  
Specification page

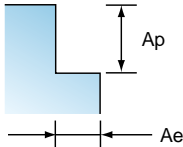
PVR

產品規格表 **P114**  
Specification page

● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Side Milling  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列側銑

| Side Milling  | CAST IRONS (LOW&MEDIUM ALLOY)<br>Gray, Malleable, Ductile |          |               | CAST IRONS (HIGH ALLOY)<br>Gray, Malleable, Ductile |                |               | STAINLESS STEELS (FREE MACHINING)<br>303, 416, 420F, 430F, 440F |           |               | STAINLESS STEELS (DIFFICULT)<br>304, 304L, 316, 316L |          |               | STAINLESS STEELS (PH)<br>13-8 PH, 15-5PH, 17-4PH, Custom 450 |         |               |
|--|---|----------|---------------|---|----------------|---------------|---|-----------|---------------|--|----------|---------------|--|---------|---------------|
|  | Hardness BRINELL  | ≤ 220    |               |   | > 220<br>≤ 260 |               |   | ≤ 275     |               |  | ≤ 275    |               |  | ≤ 325   |               |
| HRC  | ≤ 18.8  |          |               | > 18.8<br>≤ 26.6                                    |                |               | ≤ 28.5  |           |               | ≤ 28.5   |          |               | ≤ 34.4   |         |               |
| Vc (SFM)   | 100   | (96-105) |               | 100   | (96-105)       |               | 137   | (132-143) |               | 100  | (96-105) |               | 87   | (84-91) |               |
| Ae/Ap  | Ae=0.5D<br>Ap=1.5D  |          |               | Ae=0.5D<br>Ap=1.5D                                  |                |               | Ae=0.5D<br>Ap=1.5D  |           |               | Ae=0.5D<br>Ap=1.5D                                   |          |               | Ae=0.5D<br>Ap=1.5D   |         |               |
| MILL DIA. (Metric)   | RPM   | Fz       | Feed 4 Flutes | RPM   | Fz             | Feed 4 Flutes | RPM   | Fz        | Feed 4 Flutes | RPM  | Fz       | Feed 4 Flutes | RPM  | Fz      | Feed 4 Flutes |
| 3  | 12658   | 0.01016  | 514           | 9,737   | 0.00762        | 296.8         | 14,047  | 0.00762   | 428.2         | 9,737  | 0.00508  | 197.9         | 8,939  | 0.00508 | 181.6         |
| 4  | 10802   | 0.01397  | 604           | 8,309   | 0.01016        | 337.7         | 11,987  | 0.01016   | 487.1         | 8,309  | 0.00762  | 253.3         | 7,628  | 0.00762 | 232.5         |
| 6  | 7201  | 0.02350  | 677           | 5,539   | 0.01651        | 365.8         | 7,991   | 0.01651   | 527.7         | 5,539  | 0.01397  | 309.5         | 5,085  | 0.01397 | 284.2         |
| 8  | 5401  | 0.03556  | 768           | 4,155   | 0.02667        | 443.2         | 5,993   | 0.02667   | 639.4         | 4,155  | 0.02159  | 358.8         | 3,814  | 0.02159 | 329.4         |
| 10   | 4321  | 0.04763  | 823           | 3,324   | 0.03683        | 489.6         | 4,795   | 0.03683   | 706.4         | 3,324  | 0.02889  | 384.1         | 3,051  | 0.02889 | 352.6         |
| 12   | 3601  | 0.05715  | 823           | 2,770   | 0.04318        | 478.4         | 3,996   | 0.04318   | 690.1         | 2,770  | 0.03366  | 372.9         | 2,543  | 0.03366 | 342.3         |
| 16   | 2700  | 0.07620  | 823           | 2,077   | 0.05842        | 485.4         | 2,997   | 0.05842   | 700.3         | 2,077  | 0.04572  | 379.9         | 1,907  | 0.04572 | 348.8         |
| 20   | 2344  | 0.07874  | 738           | 1,803   | 0.06096        | 439.7         | 2,601   | 0.06096   | 634.3         | 1,803  | 0.04826  | 348.1         | 1,655  | 0.04826 | 319.6         |
| 25   | 1648  | 0.08636  | 569           | 1,268   | 0.06350        | 322.0         | 1,829   | 0.06350   | 464.6         | 1,268  | 0.05080  | 257.6         | 1,164  | 0.05080 | 236.5         |

Depth of cut



PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page

PVB/PVBSX

產品規格表 **P113**  
Specification page

PVR

產品規格表 **P114**  
Specification page

● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Side Milling  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列側銑

| Side Milling       | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, Incoloy 800, Monel 400 |         |               | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 718, 750X, Incoloy 925, Waspalloy, Hastelloy, Rene |         |               | TITANIUM ALLOYS<br>Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si |         |               | TITANIUM ALLOYS<br>(DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3Cr3Sn3Al |         |               |
|--------------------|---|---------|---------------|--|---------|---------------|---|---------|---------------|---|---------|---------------|
| Hardness BRINELL   | ≤ 300   |         |               | > 300  |         |               | ≤ 350   |         |               | > 350<br>≤ 440  |         |               |
| HRC                | ≤ 32.1  |         |               | ≤ 32.1   |         |               |   |         |               |   |         |               |
| Vc (SFM)           | 22  | (21-23) |               | 17   | (16-18) |               | 63  | (60-65) |               | 22  | (21-23) |               |
| Ae/Ap              | Ae=0.5D<br>Ap=1.5D  |         |               | Ae=0.5D<br>Ap=1.5D   |         |               | Ae=0.5D<br>Ap=1.5D  |         |               | Ae=0.5D<br>Ap=1.5D  |         |               |
| MILL DIA. (Metric) | RPM   | Fz      | Feed 4 Flutes | RPM  | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes |
| 3                  | 2,235   | 0.00508 | 45.4          | 1,756  | 0.00254 | 17.8          | 6,385   | 0.00508 | 129.7         | 2,235   | 0.00508 | 45.4          |
| 4                  | 1,907   | 0.00635 | 48.4          | 1,498  | 0.00381 | 22.8          | 5,448   | 0.00699 | 152.2         | 1,907   | 0.00699 | 53.3          |
| 6                  | 1,271   | 0.00953 | 48.4          | 999  | 0.00699 | 27.9          | 3,632   | 0.01175 | 170.7         | 1,271   | 0.01175 | 59.7          |
| 8                  | 953   | 0.01524 | 58.1          | 749  | 0.01016 | 30.4          | 2,724   | 0.01905 | 207.6         | 953   | 0.01905 | 72.7          |
| 10                 | 763   | 0.02096 | 63.9          | 599  | 0.01334 | 32.0          | 2,179   | 0.02635 | 229.7         | 763   | 0.02635 | 80.4          |
| 12                 | 636   | 0.02413 | 61.4          | 499  | 0.01651 | 33.0          | 1,816   | 0.03112 | 226.0         | 636   | 0.03112 | 79.1          |
| 16                 | 477   | 0.03302 | 63.0          | 375  | 0.02286 | 34.3          | 1,362   | 0.04064 | 221.4         | 477   | 0.04064 | 77.5          |
| 20                 | 414   | 0.03556 | 58.9          | 325  | 0.02540 | 33.0          | 1,182   | 0.04318 | 204.2         | 414   | 0.04318 | 71.5          |
| 25                 | 291   | 0.03810 | 44.3          | 229  | 0.02794 | 25.6          | 831   | 0.04572 | 152.0         | 291   | 0.04572 | 53.2          |

|              |  |
|--------------|--|
| Depth of cut |  |
|--------------|--|

PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page

PVB/PVBSX

產品規格表 **P113**  
Specification page

PVR

產品規格表 **P114**  
Specification page

• PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Slotting  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列溝銑切削

| Slot Milling          | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |           |                  | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |         |                  | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |                  | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |                  | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |                  |
|-----------------------|---|-----------|------------------|---|---------|------------------|---|---------|------------------|---|---------|------------------|---|---------|------------------|
| Hardness<br>BRINELL   | ≤ 275   |           |                  | ≤ 375   |         |                  | ≤ 375   |         |                  | > 375<br>≤ 475  |         |                  | > 475<br>≤ 655  |         |                  |
| HRC                   | ≤ 28.5  |           |                  | ≤ 39.8  |         |                  | ≤ 39.8  |         |                  | > 39.8<br>≤ 49.1  |         |                  | > 50<br>≤ 65  |         |                  |
| Vc<br>(SFM)           | 125   | (120-130) |                  | 57  | (55-60) |                  | 29  | (28-30) |                  | 48  | (46-50) |                  | 20  | (19-21) |                  |
| Ae/Ap                 | Ae=1D<br>Ap=1D  |           |                  | Ae=1D<br>Ap=1D  |         |                  | Ae=1D<br>Ap=1D  |         |                  | Ae=1D<br>Ap=1D  |         |                  | Ae=1D<br>Ap=1D  |         |                  |
| MILL DIA.<br>(Metric) | RPM   | Fz        | Feed<br>4 Flutes | RPM   | Fz      | Feed<br>4 Flutes | RPM   | Fz      | Feed<br>4 Flutes | RPM   | Fz      | Feed<br>4 Flutes | RPM   | Fz      | Feed<br>4 Flutes |
| 3                     | 12,770  | 0.01016   | 519.0            | 5,832   | 0.00762 | 177.77           | 3,007   | 0.01270 | 153              | 4,853   | 0.01016 | 197.2            | 2043  | 0.00508 | 41.5             |
| 4                     | 10,897  | 0.01397   | 608.9            | 4,977   | 0.00889 | 176.98           | 2,566   | 0.01715 | 176              | 4,141   | 0.01397 | 231.4            | 1744  | 0.00699 | 48.7             |
| 6                     | 7,265   | 0.02350   | 682.7            | 3,318   | 0.01842 | 244.41           | 1,711   | 0.02826 | 193              | 2,761   | 0.02350 | 259.4            | 1162  | 0.01175 | 54.6             |
| 8                     | 5,449   | 0.03683   | 802.7            | 2,489   | 0.02794 | 278.12           | 1,283   | 0.04445 | 228              | 2,070   | 0.03683 | 305.0            | 872   | 0.01842 | 64.2             |
| 10                    | 4,359   | 0.05017   | 874.6            | 1,991   | 0.03715 | 295.82           | 1,026   | 0.06064 | 249              | 1,656   | 0.05017 | 332.4            | 697   | 0.02508 | 70.0             |
| 12                    | 3,632   | 0.05969   | 867.3            | 1,659   | 0.04509 | 299.19           | 855   | 0.07176 | 246              | 1,380   | 0.05969 | 329.6            | 581   | 0.02985 | 69.4             |
| 16                    | 2,724   | 0.07874   | 858.0            | 1,244   | 0.06096 | 303.40           | 642   | 0.09906 | 254              | 1,035   | 0.08128 | 336.6            | 436   | 0.04064 | 70.9             |
| 20                    | 2,365   | 0.08128   | 768.9            | 1,080   | 0.06350 | 274.34           | 557   | 0.10668 | 238              | 899   | 0.08890 | 319.6            | 378   | 0.04445 | 67.3             |
| 25                    | 1,663   | 0.08890   | 591.3            | 759   | 0.06858 | 208.33           | 392   | 0.12700 | 199              | 632   | 0.09652 | 243.9            | 266   | 0.04826 | 51.4             |

Depth of cut

PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page

PVB/PVBSX

產品規格表 **P113**  
Specification page

PVR

產品規格表 **P114**  
Specification page

● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Slotting  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列溝銑切削

| Slot Milling          | CAST IRONS<br>(LOW&MEDIUM ALLOY)<br>Gray, Malleable, Ductile |         |                  | CAST IRONS<br>(HIGH ALLOY)<br>Gray, Malleable, Ductile |         |                  | STAINLESS STEELS<br>(FREE MACHINING )<br>304, 416,420F,430F,440F |         |                  | STAINLESS STEELS<br>(DIFFICULT )<br>304, 304L,316,316L |         |                  | STAINLESS STEELS(PH)<br>13-8 PH,15-5PH,17-4PH,<br>Custom 450 |         |                  |
|-----------------------|--|---------|------------------|--|---------|------------------|--|---------|------------------|--|---------|------------------|--|---------|------------------|
| Hardness<br>BRINELL   | ≤ 220  |         |                  | > 220<br>≤ 260   |         |                  | ≤ 275  |         |                  | ≤ 275  |         |                  | ≤ 325  |         |                  |
| HRC                   | ≤ 18.8   |         |                  | > 18.8<br>≤ 26.6                                       |         |                  | ≤ 28.5   |         |                  | ≤ 28.5   |         |                  | ≤ 34.4   |         |                  |
| Vc<br>(SFM)           | 64   | (62-67) |                  | 61   | (59-64) |                  | 88   | (84-92) |                  | 61   | (59-64) |                  | 56   | (54-59) |                  |
| Ae/Ap                 | Ae=1D<br>Ap=1D   |         |                  | Ae=1D<br>Ap=1D   |         |                  | Ae=1D<br>Ap=1D   |         |                  | Ae=1D<br>Ap=1D   |         |                  | Ae=1D<br>Ap=1D   |         |                  |
| MILL DIA.<br>(Metric) | RPM  | Fz      | Feed<br>4 Flutes | RPM  | Fz      | Feed<br>4 Flutes | RPM  | Fz      | Feed<br>4 Flutes | RPM  | Fz      | Feed<br>4 Flutes | RPM  | Fz      | Feed<br>4 Flutes |
| 3                     | 8,114  | 0.01016 | 330              | 6,242  | 0.00762 | 190.2            | 9,005  | 0.00762 | 274.5            | 6,242  | 0.00508 | 126.8            | 5,730  | 0.00508 | 116.4            |
| 4                     | 6,924  | 0.01397 | 387              | 5,326  | 0.01016 | 216.5            | 7,684  | 0.01016 | 312.3            | 5,326  | 0.00762 | 162.3            | 4,890  | 0.00762 | 149.0            |
| 6                     | 4,616  | 0.02350 | 434              | 3,551  | 0.01651 | 234.5            | 5,123  | 0.01651 | 338.3            | 3,551  | 0.01397 | 198.4            | 3,260  | 0.01397 | 182.2            |
| 8                     | 3,462  | 0.03556 | 492              | 2,663  | 0.02667 | 284.1            | 3,842  | 0.02667 | 409.9            | 2,663  | 0.02159 | 230.0            | 2,445  | 0.02159 | 211.1            |
| 10                    | 2,770  | 0.04763 | 528              | 2,131  | 0.03683 | 313.9            | 3,074  | 0.03683 | 452.8            | 2,131  | 0.02889 | 246.2            | 1,956  | 0.02889 | 226.0            |
| 12                    | 2,308  | 0.05715 | 528              | 1,775  | 0.04318 | 306.7            | 2,561  | 0.04318 | 442.4            | 1,775  | 0.03366 | 239.0            | 1,630  | 0.03366 | 219.4            |
| 16                    | 1,731  | 0.07620 | 528              | 1,332  | 0.05842 | 311.2            | 1,921  | 0.05842 | 448.9            | 1,332  | 0.04572 | 243.5            | 1,222  | 0.04572 | 223.6            |
| 20                    | 1,503  | 0.07874 | 473              | 1,156  | 0.06096 | 281.9            | 1,668  | 0.06096 | 406.6            | 1,156  | 0.04826 | 223.1            | 1,061  | 0.04826 | 204.8            |
| 25                    | 1,057  | 0.08636 | 365              | 813  | 0.06350 | 206.4            | 1,172  | 0.06350 | 297.8            | 813  | 0.05080 | 165.1            | 746  | 0.05080 | 151.6            |

Depth of cut

PVE

產品規格表 **P110**  
Specification page

PVES/PVEM/PVEL

產品規格表 **P111**  
Specification page

PVEC

產品規格表 **P112**  
Specification page

PVB/PVBSX

產品規格表 **P113**  
Specification page

PVR

產品規格表 **P114**  
Specification page

● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Slotting  
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列溝銑切削

| Slot Milling       | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, Incoly 800, Monel 400 |         |               | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 718, 750X, Incoly 925, Waspalloy, Hastelloy, Rene |         |               | TITANIUM ALLOYS<br>Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si |         |               | TITANIUM ALLOYS<br>(DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3Cr3Sn3Al |         |               |
|--------------------|--|---------|---------------|---|---------|---------------|---|---------|---------------|---|---------|---------------|
| Hardness BRINELL   | ≤ 300  |         |               | > 300   |         |               | ≤ 350   |         |               | > 350<br>≤ 440  |         |               |
| HRC                | ≤ 32.1   |         |               | ≤ 32.1  |         |               |   |         |               |   |         |               |
| Vc (SFM)           | 14   | (13-15) |               | 11  | (10-12) |               | 40  | (38-42) |               | 14  | (13-15) |               |
| Ae/Ap              | Ae=1D<br>Ap=1D   |         |               | Ae=1D<br>Ap=1D  |         |               | Ae=1D<br>Ap=1D  |         |               | Ae=1D<br>Ap=1D  |         |               |
| MILL DIA. (Metric) | RPM  | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes | RPM   | Fz      | Feed 4 Flutes |
| 3                  | 1,433  | 0.00508 | 29.1          | 1,126   | 0.00254 | 11.4          | 4,093   | 0.00508 | 83.2          | 1,433   | 0.00508 | 29.1          |
| 4                  | 1,222  | 0.00635 | 31.0          | 960   | 0.00381 | 14.6          | 3,493   | 0.00699 | 97.6          | 1,222   | 0.00699 | 34.2          |
| 6                  | 815  | 0.00953 | 31.0          | 640   | 0.00699 | 17.9          | 2,328   | 0.01175 | 109.4         | 815   | 0.01175 | 38.3          |
| 8                  | 611  | 0.01524 | 37.3          | 480   | 0.01016 | 19.5          | 1,746   | 0.01905 | 133.1         | 611   | 0.01905 | 46.6          |
| 10                 | 489  | 0.02096 | 41.0          | 384   | 0.01334 | 20.5          | 1,397   | 0.02635 | 147.3         | 489   | 0.02635 | 51.5          |
| 12                 | 407  | 0.02413 | 39.3          | 320   | 0.01651 | 21.1          | 1,164   | 0.03112 | 144.9         | 407   | 0.03112 | 50.7          |
| 16                 | 306  | 0.03302 | 40.4          | 240   | 0.02286 | 22.0          | 873   | 0.04064 | 141.9         | 306   | 0.04064 | 49.7          |
| 20                 | 265  | 0.03556 | 37.7          | 208   | 0.02540 | 21.2          | 758   | 0.04318 | 130.9         | 265   | 0.04318 | 45.8          |
| 25                 | 187  | 0.03810 | 28.4          | 147   | 0.02794 | 16.4          | 533   | 0.04572 | 97.5          | 187   | 0.04572 | 34.1          |

Depth of cut

產品規格表 **P118-119**  
Specification page

● P-SFUMIE 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 60              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Diameter<br>D                       | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.2                                | 25000                  | 144                 | 22500                  | 130                 |
| D0.3                                | 25000                  | 171                 | 22500                  | 154                 |
| D0.4                                | 25000                  | 189                 | 22500                  | 170                 |
| D0.5                                | 25000                  | 216                 | 22500                  | 194                 |
| D0.6                                | 25000                  | 216                 | 22500                  | 194                 |
| D0.7                                | 23000                  | 252                 | 20700                  | 227                 |
| D0.8                                | 21500                  | 270                 | 19350                  | 134                 |
| D0.9                                | 20000                  | 324                 | 18000                  | 292                 |

產品規格表 **P120-121**  
Specification page

## ● P-SFUET 2,4 Flutes 標準切削

| Working material hardness<br>被切削材硬度 | Below ~HRC30 |        | HRC30~35 |        | HRC35-40 |        | HRC40-45 |        | HRC45-65 |        |
|-------------------------------------|--------------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
|                                     | RPM          | mm/min | RPM      | mm/min | RPM      | mm/min | RPM      | mm/min | RPM      | mm/min |
| D1                                  | 17600        | 660    | 16280    | 550    | 15290    | 495    | 14300    | 440    | 11550    | 418    |
| D2                                  | 16280        | 770    | 15290    | 715    | 14080    | 660    | 12265    | 638    | 9900     | 550    |
| D3                                  | 13200        | 1210   | 12100    | 1100   | 10780    | 990    | 9900     | 880    | 8580     | 550    |
| D4                                  | 12650        | 1760   | 10780    | 1485   | 9900     | 1045   | 9350     | 825    | 7700     | 748    |
| D5                                  | 11000        | 2200   | 10450    | 1870   | 9790     | 1430   | 8580     | 1100   | 6050     | 660    |
| D6                                  | 11000        | 2200   | 9900     | 1815   | 9020     | 1320   | 8360     | 1045   | 5500     | 605    |
| D8                                  | 7150         | 2420   | 6600     | 1980   | 4950     | 1650   | 4400     | 1320   | 2750     | 715    |
| D10                                 | 4180         | 2090   | 3300     | 1650   | 2750     | 1210   | 2200     | 990    | 1760     | 550    |
| D12                                 | 3520         | 1980   | 2970     | 1650   | 2750     | 1320   | 2200     | 1100   | 1320     | 495    |

產品規格表 **P130-131**  
Specification page

## ● P-SFUBT 2,4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | Below ~HRC30           |                     | HRC30~45               |                     | HRC45~65               |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                               | 28160                  | 1056                | 22880                  | 704                 | 18480                  | 669                 |
| D1R                                 | 26048                  | 1232                | 19624                  | 1021                | 15840                  | 880                 |
| D1.5R                               | 21120                  | 1936                | 15840                  | 1408                | 13728                  | 880                 |
| D2R                                 | 20240                  | 2816                | 14960                  | 1320                | 12320                  | 1197                |
| D2.5R                               | 17600                  | 3520                | 13728                  | 1760                | 9680                   | 1056                |
| D3R                                 | 17600                  | 3520                | 13376                  | 1672                | 8800                   | 968                 |
| D4R                                 | 11440                  | 3872                | 7040                   | 2112                | 4400                   | 1144                |
| D5R                                 | 6688                   | 3344                | 3520                   | 1584                | 2816                   | 880                 |
| D6R                                 | 5632                   | 3168                | 3520                   | 1760                | 2112                   | 792                 |



產品規格表 **P122**  
Specification page

### ● P-SFULET 2 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼·合金鋼 ~HRC30 |                               | Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼·工具鋼HRC30~45 |                                      | Austenitic stainless steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                               |               |                                      |                               |               |
|-----------------------|--|-------------------------------|--|--------------------------------------|---|---------------|---|-------------------------------|---------------|--------------------------------------|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 30~50m/min   |                               | 30~40m/min   |                                      | 20~30m/min  |               | 15~25m/min  |                               |               |                                      |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |  | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度   |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數                                      | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |  | Side Milling<br>側面            | Slotting<br>溝  |                                      | Side Milling<br>側面  | Slotting<br>溝 |   | Side Milling<br>側面            | Slotting<br>溝 |                                      | Side Milling<br>側面            | Slotting<br>溝 |
| 1                     | 13,000   | 60                            | 60   | 9,500                                | 45  | 45            | 8,000   | 35                            | 35            | 6,400                                | 25                            | 25            |
| 1.5                   | 8,500  | 60                            | 60   | 6,400                                | 45  | 45            | 5,300   | 35                            | 35            | 4,200                                | 25                            | 25            |
| 2                     | 6,400  | 60                            | 60   | 4,800                                | 45  | 45            | 4,000   | 35                            | 35            | 3,200                                | 25                            | 25            |
| 2.5                   | 5,100  | 60                            | 60   | 3,800                                | 45  | 45            | 3,200   | 40                            | 40            | 2,500                                | 25                            | 25            |
| 3                     | 4,200  | 65                            | 60   | 3,400                                | 55  | 45            | 2,600   | 40                            | 40            | 2,100                                | 25                            | 25            |
| 4                     | 3,400  | 80                            | 60   | 2,700                                | 65  | 45            | 2,100   | 50                            |               | 1,700                                | 35                            | 25            |
|                       |  |                               |  |                                      |   |               | 1,600   |                               | 30            |                                      |                               |               |
| 5                     | 2,900  | 100                           | 60   | 2,300                                | 80  | 45            | 1,800   | 60                            |               | 1,500                                | 40                            | 25            |
|                       |  |                               |  |                                      |   |               | 1,350   |                               | 30            |                                      |                               |               |
| 6                     | 2,500  | 120                           | 60   | 2,000                                | 100   | 50            | 1,500   | 75                            |               | 1,300                                | 50                            | 25            |
|                       |  |                               |  |                                      |   |               | 1,100   |                               | 30            |                                      |                               |               |
| 8                     | 1,900  | 130                           | 60   | 1,500                                | 100   | 50            | 1,200   | 80                            |               | 1,000                                | 50                            | 25            |
|                       |  |                               |  |                                      |   |               | 900   |                               | 30            |                                      |                               |               |
| 10                    | 1,600  | 130                           | 60   | 1,300                                | 100   | 50            | 950   | 75                            |               | 800                                  | 50                            | 25            |
|                       |  |                               |  |                                      |   |               | 710   |                               | 30            |                                      |                               |               |
| 12                    | 1,300  | 120                           | 60   | 1,100                                | 100   | 50            | 800   | 75                            |               | 670                                  | 50                            | 25            |
|                       |  |                               |  |                                      |   |               | 600   |                               | 30            |                                      |                               |               |
| 16                    | 1,000  | 80                            | 40   | 820                                  | 65  | 30            | 600   | 45                            |               | 500                                  | 30                            | 15            |
|                       |  |                               |  |                                      |   |               | 450   |                               | 20            |                                      |                               |               |
| 20                    | 800  | 65                            | 30   | 650                                  | 50  | 25            | 480   | 40                            |               | 400                                  | 25                            | 13            |
|                       |  |                               |  |                                      |   |               | 360   |                               | 15            |                                      |                               |               |
| 25                    | 650  | 50                            | 25   | 520                                  | 40  | 20            | 380   | 30                            |               | 320                                  | 20                            | 10            |
|                       |  |                               |  |                                      |   |               | 280   |                               | 12            |                                      |                               |               |

Depth of cut  
(D:直徑Dia)  
切削量基準

1. Please use SI coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

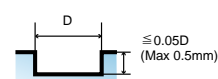
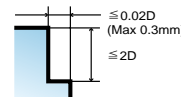
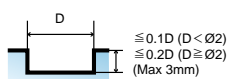
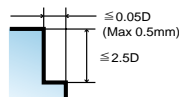
1. 切削 50~60 HRC 以上之材料時，請使用 SI 鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
3. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之 1/3 以下。

產品規格表 **P123**  
Specification page

### ● P-SFULET 4 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels,<br>Alloy Steels S50C, SCM,<br>鑄鐵 FC250 等<br>AISI 1049, Cast iron<br>碳素鋼,<br>合金鋼-HRC30 |                               |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK 等<br>Prehardened Steels,<br>AISI H13<br>合金鋼, 工具鋼 |                               |               | Austenitic stainless Steels<br>SUS304, SUS316 等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                               |               | Hardened Steels<br>SKD61, SKD11, NAK,<br>STAVAX 等<br>AISI H13<br>熱處理鋼 HRC45~50 |                               |               | Non is essential please<br>don't attempt<br>Hardened Steels<br>SKD11 等<br>AISI D2<br>[非必要請勿嘗試]<br>熱處理鋼(HRC50~60) |                               |               |
|-----------------------|--|-------------------------------|---------------|---|-------------------------------|---------------|--|-------------------------------|---------------|--|-------------------------------|---------------|--|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 35~50m/min   |                               |               | 30~40m/min  |                               |               | 20~30m/min   |                               |               | 15~25m/min   |                               |               | 15~20m/min   |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |  | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |
| 1                     | 11,000   | 85                            | 40            | 9,500   | 65                            | 30            | 8,000  | 50                            |               | 6,400  | 35                            | 17            | 4,800  | 20                            | 10            |
| 1.5                   | 7,400  | 85                            | 40            | 6,400   | 90                            | 45            | 5,300  | 50                            |               | 4,200  | 35                            | 17            | 3,200  | 20                            | 10            |
|                       |  |                               |               |   |                               |               | 4,240  |                               | 20            |  |                               |               |  |                               |               |
| 2                     | 5,600  | 85                            | 40            | 4,800   | 90                            | 45            | 4,000  | 50                            |               | 3,200  | 35                            | 17            | 2,400  | 20                            | 10            |
|                       |  |                               |               |   |                               |               | 3,200  |                               | 20            |  |                               |               |  |                               |               |
| 2.5                   | 4,500  | 85                            | 40            | 3,800   | 90                            | 45            | 3,200  | 55                            |               | 2,500  | 35                            | 17            | 2,100  | 20                            | 10            |
|                       |  |                               |               |   |                               |               | 2,560  |                               | 22            |  |                               |               |  |                               |               |
| 3                     | 4,200  | 100                           | 50            | 3,400   | 90                            | 45            | 2,600  | 60                            |               | 2,100  | 35                            | 17            | 1,800  | 25                            | 12            |
|                       |  |                               |               |   |                               |               | 2,080  |                               | 24            |  |                               |               |  |                               |               |
| 4                     | 3,400  | 125                           | 60            | 2,700   | 90                            | 45            | 2,100  | 70                            |               | 1,700  | 50                            | 25            | 1,400  | 30                            | 15            |
|                       |  |                               |               |   |                               |               | 1,680  |                               | 28            |  |                               |               |  |                               |               |
| 5                     | 2,900  | 155                           | 75            | 2,300   | 110                           | 55            | 1,800  | 85                            |               | 1,500  | 55                            | 27            | 1,200  | 35                            | 17            |
|                       |  |                               |               |   |                               |               | 1,440  |                               | 34            |  |                               |               |  |                               |               |
| 6                     | 2,500  | 180                           | 90            | 2,000   | 140                           | 70            | 1,500  | 110                           |               | 1,300  | 70                            | 35            | 1,000  | 40                            | 20            |
|                       |  |                               |               |   |                               |               | 1,200  |                               | 44            |  |                               |               |  |                               |               |
| 8                     | 1,900  | 200                           | 100           | 1,500   | 140                           | 70            | 1,200  | 110                           |               | 1,000  | 70                            | 35            | 800  | 40                            | 20            |
|                       |  |                               |               |   |                               |               | 960  |                               | 44            |  |                               |               |  |                               |               |
| 10                    | 1,600  | 205                           | 100           | 1,300   | 140                           | 70            | 950  | 110                           |               | 800  | 70                            | 35            | 650  | 40                            | 20            |
|                       |  |                               |               |   |                               |               | 760  |                               | 44            |  |                               |               |  |                               |               |
| 12                    | 1,300  | 180                           | 90            | 1,100   | 140                           | 70            | 800  | 110                           |               | 670  | 70                            | 35            | 530  | 40                            | 20            |
|                       |  |                               |               |   |                               |               | 640  |                               | 44            |  |                               |               |  |                               |               |
| 16                    | 1,000  | 120                           | 60            | 820   | 100                           | 50            | 600  | 80                            |               | 500  | 50                            | 25            | 400  | 30                            | 15            |
|                       |  |                               |               |   |                               |               | 480  |                               | 32            |  |                               |               |  |                               |               |
| 20                    | 800  | 95                            | 45            | 650   | 75                            | 35            | 480  | 70                            |               | 400  | 40                            | 20            | 320  | 25                            | 12            |
|                       |  |                               |               |   |                               |               | 384  |                               | 28            |  |                               |               |  |                               |               |
| 25                    | 650  | 75                            | 35            | 520   | 60                            | 30            | 380  | 50                            |               | 320  | 35                            | 17            | 250  | 20                            | 10            |
|                       |  |                               |               |   |                               |               | 280  |                               | 20            |  |                               |               |  |                               |               |

Depth of cut  
(D:直徑Dia)  
切削量基準



- In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
- If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- When drilling, please set the feed rate at 1/3 or below of the above value.

- 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
- 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
- 縱向進給時，進給速度請設定為上表之 1/3 以下。

Unit/單位: mm

產品規格表 **P124**  
Specification page

| ● P-SFUVT Multi Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度           | HRC45~ 52              |                     | HRC52~ 62              |                     |
|   | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Diameter<br>D 值                               | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0  | 17550                  | 1872                | 8450                   | 936                 |
| D4.0  | 13650                  | 2223                | 6500                   | 1053                |
| D5.0  | 11700                  | 2516                | 5785                   | 1229                |
| D6.0  | 10400                  | 3393                | 5200                   | 1697                |
| D8.0  | 5800                   | 3393                | 3000                   | 1697                |
| D10.0   | 4200                   | 3335                | 2500                   | 1697                |
| D12.0   | 3100                   | 2808                | 1900                   | 1404                |
| D16.0   | 1800                   | 2106                | 1350                   | 1053                |

產品規格表 **P125**  
Specification page

| ● P-SFULVT Multi Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|--|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度            | HRC45~ 52              |                     | HRC52~ 62              |                     |
|  | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Diameter<br>D 值                                | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D3.0   | 6500                   | 749                 | 3380                   | 374                 |
| D4.0   | 5800                   | 889                 | 2600                   | 421                 |
| D5.0   | 4200                   | 1006                | 2314                   | 492                 |
| D6.0   | 3850                   | 1357                | 2080                   | 679                 |
| D8.0   | 2800                   | 1357                | 1560                   | 679                 |
| D10.0  | 2250                   | 1334                | 1248                   | 679                 |
| D12.0  | 1650                   | 1123                | 1040                   | 562                 |
| D16.0  | 850                    | 842                 | 780                    | 421                 |

產品規格表 **P126-127**  
Specification page

## • P-SFULNT 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | HRC30~ 50              |                     | HRC50~ 55              |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D1.6-14                             | 19904                  | 1592                | 15924                  | 1274                |
| D1.6-16                             | 18909                  | 1513                | 15127                  | 1210                |
| D1.6-18                             | 17964                  | 1437                | 14371                  | 1150                |
| D1.6-20                             | 17066                  | 1365                | 13652                  | 1092                |
| D1.8-8                              | 17693                  | 1415                | 14154                  | 1132                |
| D1.8-14                             | 16808                  | 1345                | 13447                  | 1076                |
| D1.8-20                             | 15968                  | 1277                | 12774                  | 1022                |
| D2-6                                | 15924                  | 1274                | 12739                  | 1019                |
| D2-8                                | 15127                  | 1210                | 12102                  | 968                 |
| D2-10                               | 14371                  | 1150                | 11497                  | 920                 |
| D2-12                               | 13652                  | 1092                | 10922                  | 874                 |
| D2-14                               | 12970                  | 1038                | 10376                  | 830                 |
| D2-16                               | 12321                  | 986                 | 9857                   | 789                 |
| D2-18                               | 11705                  | 936                 | 9364                   | 749                 |
| D2-20                               | 11120                  | 890                 | 8896                   | 712                 |
| D2.5-8                              | 12739                  | 1274                | 10191                  | 1019                |
| D2.5-12                             | 12102                  | 1210                | 9682                   | 968                 |
| D2.5-16                             | 11497                  | 1150                | 9197                   | 920                 |
| D2.5-20                             | 10922                  | 1092                | 8738                   | 874                 |
| D3-8                                | 10616                  | 1062                | 8493                   | 849                 |
| D3-12                               | 10085                  | 1008                | 8068                   | 807                 |
| D3-16                               | 9581                   | 958                 | 7665                   | 766                 |
| D3-20                               | 9102                   | 910                 | 7281                   | 728                 |
| D3-25                               | 8647                   | 865                 | 6917                   | 692                 |
| D3.5-12                             | 9099                   | 1092                | 7279                   | 874                 |
| D3.5-16                             | 8644                   | 1037                | 6915                   | 830                 |
| D3.5-20                             | 8212                   | 985                 | 6570                   | 788                 |
| D3.5-25                             | 7801                   | 936                 | 6241                   | 749                 |
| D3.5-30                             | 7411                   | 889                 | 5929                   | 711                 |
| D4-12                               | 7962                   | 955                 | 6369                   | 764                 |
| D4-16                               | 7564                   | 908                 | 6051                   | 726                 |
| D4-20                               | 7186                   | 862                 | 5748                   | 690                 |
| D4-25                               | 6826                   | 819                 | 5461                   | 655                 |
| D4-30                               | 6485                   | 778                 | 5188                   | 623                 |
| D4-35                               | 6161                   | 739                 | 4929                   | 591                 |

Unit/單位: mm

產品規格表 **P128-129**  
Specification page

| ● P-SFUMIB 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |
|--|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度        | HRC30~ 50              |                     | HRC50~ 60              |                     |
|  | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
| Radius of Ball Nose<br>R 徑                 | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.15R                                     | 25000                  | 220                 | 25000                  | 198                 |
| D0.2R                                      | 25000                  | 275                 | 25000                  | 248                 |
| D0.25R                                     | 25000                  | 330                 | 25000                  | 297                 |
| D0.3R                                      | 25000                  | 418                 | 25000                  | 376                 |
| D0.35R                                     | 25000                  | 495                 | 25000                  | 446                 |
| D0.4R                                      | 25000                  | 561                 | 25000                  | 505                 |
| D0.45R                                     | 25000                  | 638                 | 25000                  | 574                 |
| D0.5R                                      | 21000                  | 640                 | 17000                  | 610                 |

產品規格表 **P130-131**  
Specification page

## ● P-SFUBT 2,4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | Below ~HRC30           |                     | HRC30~45               |                     | HRC45~65               |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| Radius of Ball Nose<br>R 徑          |                        |                     |                        |                     |                        |                     |
| D0.5R                               | 28160                  | 1056                | 22880                  | 704                 | 18480                  | 669                 |
| D1R                                 | 26048                  | 1232                | 19624                  | 1021                | 15840                  | 880                 |
| D1.5R                               | 21120                  | 1936                | 15840                  | 1408                | 13728                  | 880                 |
| D2R                                 | 20240                  | 2816                | 14960                  | 1320                | 12320                  | 1197                |
| D2.5R                               | 17600                  | 3520                | 13728                  | 1760                | 9680                   | 1056                |
| D3R                                 | 17600                  | 3520                | 13376                  | 1672                | 8800                   | 968                 |
| D4R                                 | 11440                  | 3872                | 7040                   | 2112                | 4400                   | 1144                |
| D5R                                 | 6688                   | 3344                | 3520                   | 1584                | 2816                   | 880                 |
| D6R                                 | 5632                   | 3168                | 3520                   | 1760                | 2112                   | 792                 |

產品規格表 **P132**  
Specification page

| ● P-SFUBTSX 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |                        |                     |
|---|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度         | Below ~HRC30           |                     | HRC30~45               |                     | HRC45~65               |                     |
| Radius of Ball Nose<br>R 徑                  | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|   | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                                       | 30720                  | 1152                | 24960                  | 768                 | 20160                  | 730                 |
| D1.0R                                       | 28416                  | 1344                | 21408                  | 1113.6              | 17280                  | 960                 |
| D1.5R                                       | 23040                  | 2112                | 17280                  | 1536                | 14976                  | 960                 |
| D2.0R                                       | 22080                  | 3072                | 16320                  | 1440                | 13440                  | 1305                |
| D2.5R                                       | 19200                  | 3840                | 14976                  | 1920                | 10560                  | 1152                |
| D3.0R                                       | 19200                  | 3840                | 14592                  | 1824                | 9600                   | 1056                |
| D4.0R                                       | 12480                  | 4224                | 7680                   | 2304                | 4800                   | 1248                |
| D5.0R                                       | 7296                   | 3648                | 3840                   | 1728                | 3072                   | 960                 |
| D6.0R                                       | 6144                   | 3456                | 3840                   | 1920                | 2304                   | 864                 |

產品規格表 **P133**  
Specification page

| ● P-SFULBT 2 Flutes Cutting Condition 標準切削 |                        |                     |                        |                     |                        |                     |
|--|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
| Working material hardness<br>被切削材硬度        | Below ~HRC30           |                     | HRC30~45               |                     | HRC45~65               |                     |
| Radius of Ball Nose<br>R 徑                 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|  | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     | RPM<br>轉/分             | mm/min.<br>mm/分     |
| D0.5R                                      | 25600                  | 960                 | 20800                  | 640                 | 16800                  | 608                 |
| D1.0R                                      | 23680                  | 1120                | 17840                  | 928                 | 14400                  | 800                 |
| D1.5R                                      | 19200                  | 1760                | 14400                  | 1280                | 12480                  | 800                 |
| D2.0R                                      | 18400                  | 2560                | 13600                  | 1200                | 11200                  | 1088                |
| D2.5R                                      | 16000                  | 3200                | 12480                  | 1600                | 8800                   | 960                 |
| D3.0R                                      | 16000                  | 3200                | 12160                  | 1520                | 8000                   | 880                 |
| D4.0R                                      | 10400                  | 3520                | 6400                   | 1920                | 4000                   | 1040                |
| D5.0R                                      | 6080                   | 3040                | 3200                   | 1440                | 2560                   | 800                 |
| D6.0R                                      | 5120                   | 2880                | 3200                   | 1600                | 1920                   | 720                 |

產品規格表 **P136**  
Specification page

## ● P-SFURTA 4 Flutes 標準切削

| Working material hardness<br>被切削材硬度 | Below ~HRC30               |      | ~HRC40 |      | ~HRC50 |      | ~HRC55 |      | ~HRC60 |     |
|-------------------------------------|----------------------------|------|--------|------|--------|------|--------|------|--------|-----|
|                                     | Diameter × Radius<br>D × R | RPM  | mm/min | RPM  | mm/min | RPM  | mm/min | RPM  | mm/min | RPM |
| D1.0x0.1R                           | 13068                      | 647  | 11550  | 561  | 9570   | 429  | 7920   | 370  | 6468   | 297 |
| D1.0x0.2R                           | 13068                      | 647  | 11550  | 561  | 9570   | 429  | 7920   | 370  | 6468   | 297 |
| D1.0x0.3R                           | 13068                      | 647  | 11550  | 561  | 9570   | 429  | 7920   | 370  | 6468   | 297 |
| D1.5x0.2R                           | 11550                      | 792  | 10032  | 594  | 9108   | 462  | 6930   | 396  | 5610   | 330 |
| D1.5x0.3R                           | 11550                      | 792  | 10032  | 594  | 9108   | 462  | 6930   | 396  | 5610   | 330 |
| D2.0x0.1R                           | 10560                      | 990  | 8712   | 726  | 8316   | 594  | 6468   | 495  | 4752   | 330 |
| D2.0x0.2R                           | 10560                      | 990  | 8712   | 726  | 8316   | 594  | 6468   | 495  | 4752   | 330 |
| D2.0x0.3R                           | 10560                      | 990  | 8712   | 726  | 8316   | 594  | 6468   | 495  | 4752   | 330 |
| D3.0x0.1R                           | 8580                       | 1188 | 7260   | 990  | 6468   | 792  | 5412   | 693  | 4950   | 330 |
| D3.0x0.2R                           | 8580                       | 1188 | 7260   | 990  | 6468   | 792  | 5412   | 693  | 4950   | 330 |
| D3.0x0.3R                           | 8580                       | 1188 | 7260   | 990  | 6468   | 792  | 5412   | 693  | 4950   | 330 |
| D4.0x0.2R                           | 8250                       | 1320 | 6930   | 1188 | 6138   | 693  | 5181   | 561  | 4488   | 330 |
| D4.0x0.3R                           | 8250                       | 1320 | 6930   | 1188 | 6138   | 693  | 5181   | 561  | 4488   | 330 |
| D2.0x0.5R                           | 10560                      | 792  | 9570   | 726  | 858    | 594  | 6600   | 495  | 6072   | 396 |
| D3.0x0.5R                           | 8580                       | 1320 | 7260   | 1188 | 6468   | 990  | 5412   | 726  | 4950   | 330 |
| D4.0x0.5R                           | 8250                       | 1320 | 6930   | 1188 | 6138   | 693  | 5181   | 561  | 4488   | 330 |
| D6.0x0.5R                           | 7590                       | 1980 | 6600   | 1716 | 5808   | 1320 | 4752   | 990  | 3036   | 495 |
| D8.0x0.5R                           | 5709                       | 2244 | 5247   | 1782 | 3531   | 1122 | 3069   | 792  | 2541   | 541 |
| D10.0x0.5R                          | 3630                       | 1848 | 2772   | 1254 | 2112   | 726  | 1782   | 627  | 1089   | 383 |
| D12.0x0.5R                          | 3069                       | 1914 | 2277   | 1122 | 1452   | 627  | 1188   | 528  | 858    | 350 |
| D3.0x1R                             | 9867                       | 1518 | 8349   | 1366 | 7438   | 1139 | 6224   | 835  | 5693   | 380 |
| D4.0x1R                             | 9488                       | 1518 | 7970   | 1367 | 7059   | 798  | 5959   | 646  | 5161   | 380 |
| D6.0x1R                             | 8729                       | 2277 | 7590   | 1973 | 6679   | 1518 | 5465   | 1139 | 3491   | 570 |
| D8.0x1R                             | 6566                       | 2581 | 6035   | 2049 | 4061   | 1290 | 3530   | 911  | 2923   | 623 |
| D10.0x1R                            | 4175                       | 2112 | 3288   | 1442 | 2429   | 835  | 2049   | 722  | 1253   | 440 |
| D12.0x1R                            | 3530                       | 2201 | 2619   | 1290 | 1670   | 941  | 1366   | 574  | 987    | 403 |
| D6.0x1.5R                           | 7590                       | 2376 | 7920   | 2059 | 6970   | 1584 | 5702   | 1188 | 3643   | 594 |
| D8.0x1.5R                           | 6851                       | 2693 | 6296   | 2138 | 4237   | 1346 | 3683   | 950  | 3049   | 649 |
| D10.0x1.5R                          | 396                        | 2218 | 3326   | 1505 | 2534   | 871  | 2138   | 752  | 1307   | 460 |
| D12.0x1.5R                          | 3683                       | 2297 | 2732   | 1346 | 1742   | 752  | 1426   | 634  | 1030   | 420 |
| D6.0x2R                             | 9867                       | 2574 | 8580   | 2231 | 7550   | 1716 | 6178   | 1287 | 3947   | 644 |
| D8.0x2R                             | 7422                       | 2917 | 6821   | 2317 | 4590   | 1459 | 3990   | 3303 | 3303   | 704 |
| D10.0x2R                            | 4719                       | 2402 | 3604   | 1630 | 2746   | 944  | 2317   | 1416 | 1416   | 497 |
| D12.0x2R                            | 3990                       | 2488 | 2960   | 1459 | 1888   | 815  | 1544   | 1115 | 1115   | 454 |
| D8.0x3R                             | 7708                       | 3029 | 7084   | 2406 | 4767   | 1515 | 4144   | 1069 | 3432   | 730 |
| D10.0x3R                            | 4901                       | 2495 | 3742   | 1693 | 2851   | 980  | 2406   | 847  | 1471   | 517 |
| D12.0x3R                            | 4144                       | 2584 | 4175   | 1515 | 1960   | 847  | 1604   | 713  | 1158   | 473 |

Unit/單位: mm



產品規格表 **P137**  
Specification page

## ● P-SFUCRM 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                     |                     | ~HRC40                 |                     | ~HRC50                 |                     | ~HRC55                 |                     | ~HRC60                 |                     |
|-------------------------------------|----------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速     | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter × Radius<br>D × R | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D3.0 x 0.1R                         | 5460                       | 756                 | 4620                   | 630                 | 4116                   | 504                 | 3444                   | 441                 | 3150                   | 210                 |
| D3.0 x 0.2R                         | 5460                       | 756                 | 4620                   | 630                 | 4116                   | 504                 | 3444                   | 441                 | 3150                   | 210                 |
| D3.0 x 0.3R                         | 5460                       | 756                 | 4620                   | 630                 | 4116                   | 504                 | 3444                   | 441                 | 3150                   | 210                 |
| D4.0 x 0.3R                         | 5250                       | 840                 | 4410                   | 756                 | 3906                   | 441                 | 3297                   | 357                 | 2856                   | 210                 |
| D2.0 x 0.5R                         | 6720                       | 504                 | 6090                   | 462                 | 5460                   | 378                 | 4620                   | 315                 | 3864                   | 252                 |
| D3.0 x 0.5R                         | 5460                       | 840                 | 4620                   | 756                 | 4116                   | 630                 | 3444                   | 462                 | 3150                   | 210                 |
| D4.0 x 0.5R                         | 5250                       | 840                 | 4410                   | 756                 | 3906                   | 441                 | 3297                   | 357                 | 2856                   | 210                 |
| D6.0 x 0.5R                         | 4830                       | 1260                | 4200                   | 1092                | 3696                   | 840                 | 3024                   | 630                 | 1932                   | 315                 |
| D8.0 x 0.5R                         | 3633                       | 1428                | 3339                   | 1134                | 2247                   | 714                 | 1953                   | 504                 | 1617                   | 344                 |
| D10.0 x 0.5R                        | 2310                       | 1176                | 1764                   | 798                 | 1344                   | 462                 | 1134                   | 399                 | 693                    | 244                 |
| D12.0 x 0.5R                        | 1953                       | 1218                | 1449                   | 714                 | 924                    | 399                 | 756                    | 336                 | 546                    | 223                 |
| D3.0 x 1R                           | 6279                       | 966                 | 5313                   | 869                 | 4733                   | 725                 | 3961                   | 531                 | 3623                   | 242                 |
| D4.0 x 1R                           | 6600                       | 966                 | 5072                   | 870                 | 4492                   | 507                 | 3792                   | 411                 | 3284                   | 242                 |
| D6.0 x 1R                           | 5555                       | 1449                | 4830                   | 1256                | 4250                   | 966                 | 3478                   | 725                 | 2222                   | 362                 |
| D8.0 x 1R                           | 4178                       | 1642                | 3840                   | 1304                | 2584                   | 821                 | 2246                   | 580                 | 1860                   | 396                 |
| D10.0 x 1R                          | 2657                       | 1344                | 2029                   | 918                 | 1546                   | 531                 | 1304                   | 459                 | 797                    | 280                 |
| D12.0 x 1R                          | 2246                       | 1401                | 1667                   | 821                 | 1063                   | 599                 | 869                    | 386                 | 628                    | 256                 |
| D6.0 x 1.5R                         | 5796                       | 1512                | 5040                   | 1310                | 4435                   | 1008                | 3629                   | 756                 | 2318                   | 378                 |
| D8.0 x 1.5R                         | 4360                       | 1714                | 4007                   | 1361                | 2696                   | 857                 | 2344                   | 605                 | 1940                   | 413                 |
| D10.0 x 1.5R                        | 2772                       | 1411                | 2117                   | 958                 | 1613                   | 554                 | 1361                   | 479                 | 832                    | 292                 |
| D12.0 x 1.5R                        | 2344                       | 1462                | 1739                   | 857                 | 1109                   | 479                 | 907                    | 403                 | 6555                   | 267                 |
| D6.0 x 2R                           | 6279                       | 1638                | 5460                   | 1420                | 4805                   | 1092                | 3931                   | 819                 | 2512                   | 410                 |
| D8.0 x 2R                           | 4723                       | 1856                | 4341                   | 1474                | 2921                   | 928                 | 2539                   | 2102                | 2102                   | 448                 |
| D10.0 x 2R                          | 3003                       | 1529                | 2293                   | 1037                | 1747                   | 601                 | 1474                   | 901                 | 901                    | 317                 |
| D12.0 x 2R                          | 2539                       | 1583                | 1884                   | 928                 | 1201                   | 519                 | 983                    | 710                 | 710                    | 289                 |
| D8.0 x 3R                           | 4905                       | 1928                | 4508                   | 1531                | 3034                   | 964                 | 2637                   | 680                 | 2184                   | 465                 |
| D10.0 x 3R                          | 3119                       | 1588                | 2381                   | 1077                | 1814                   | 624                 | 1531                   | 539                 | 936                    | 329                 |
| D12.0 x 3R                          | 2637                       | 1644                | 1956                   | 964                 | 1247                   | 539                 | 1021                   | 454                 | 737                    | 301                 |

產品規格表 **P138**  
Specification page

● P-SFUCRM 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                     |                     | ~HRC40                 |                     | ~HRC50                 |                     | ~HRC55                 |                     | ~HRC60                 |                     |
|-------------------------------------|----------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速     | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter × Radius<br>D × R | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D3.0 x 0.1R                         | 6006                       | 831                 | 5082                   | 693                 | 4527                   | 554                 | 3788                   | 485                 | 3465                   | 231                 |
| D3.0 x 0.2R                         | 6006                       | 831                 | 5802                   | 693                 | 4527                   | 554                 | 3788                   | 485                 | 3465                   | 231                 |
| D3.0 x 0.3R                         | 6006                       | 831                 | 5082                   | 693                 | 4527                   | 554                 | 3788                   | 485                 | 3465                   | 231                 |
| D4.0 x 0.3R                         | 5775                       | 924                 | 4851                   | 831                 | 4296                   | 485                 | 3626                   | 392                 | 3141                   | 231                 |
| D2.0 x 0.5R                         | 7392                       | 554                 | 6699                   | 508                 | 6006                   | 415                 | 5082                   | 346                 | 4250                   | 277                 |
| D3.0 x 0.5R                         | 6006                       | 924                 | 5082                   | 831                 | 4527                   | 693                 | 3788                   | 508                 | 3465                   | 231                 |
| D4.0 x 0.5R                         | 5775                       | 924                 | 4581                   | 831                 | 4296                   | 485                 | 3626                   | 392                 | 3141                   | 231                 |
| D6.0 x 0.5R                         | 5313                       | 1386                | 4620                   | 1201                | 4065                   | 924                 | 3326                   | 693                 | 2125                   | 346                 |
| D8.0 x 0.5R                         | 3996                       | 1570                | 3672                   | 1247                | 2471                   | 785                 | 2148                   | 554                 | 1778                   | 378                 |
| D10.0 x 0.5R                        | 2541                       | 1293                | 1940                   | 877                 | 1478                   | 508                 | 1247                   | 438                 | 762                    | 268                 |
| D12.0 x 0.5R                        | 2148                       | 1339                | 1593                   | 785                 | 1016                   | 438                 | 831                    | 369                 | 600                    | 245                 |
| D3.0 x 1R                           | 6906                       | 1062                | 5844                   | 955                 | 5206                   | 797                 | 4357                   | 584                 | 3985                   | 266                 |
| D4.0 x 1R                           | 6641                       | 1062                | 5579                   | 957                 | 4941                   | 557                 | 4171                   | 452                 | 3612                   | 266                 |
| D6.0 x 1R                           | 6110                       | 1593                | 5313                   | 1381                | 4675                   | 1062                | 3825                   | 797                 | 2444                   | 398                 |
| D8.0 x 1R                           | 4595                       | 1806                | 4224                   | 1434                | 2842                   | 903                 | 2470                   | 638                 | 2046                   | 398                 |
| D10.0 x 1R                          | 2922                       | 1478                | 2231                   | 1009                | 1700                   | 584                 | 1431                   | 504                 | 876                    | 308                 |
| D12.0 x 1R                          | 2470                       | 1541                | 1833                   | 903                 | 1169                   | 658                 | 955                    | 424                 | 690                    | 281                 |
| D6.0 x 1.5R                         | 6375                       | 1663                | 5544                   | 1441                | 4878                   | 1108                | 3991                   | 831                 | 2549                   | 415                 |
| D8.0 x 1.5R                         | 4796                       | 1885                | 4407                   | 1497                | 2965                   | 942                 | 2578                   | 665                 | 2134                   | 454                 |
| D10.0 x 1.5R                        | 3049                       | 1552                | 2328                   | 1053                | 1774                   | 609                 | 1479                   | 526                 | 915                    | 321                 |
| D12.0 x 1.5R                        | 2578                       | 1608                | 1912                   | 942                 | 1219                   | 526                 | 997                    | 443                 | 720                    | 293                 |
| D6.0 x 2R                           | 6900                       | 1801                | 6006                   | 1502                | 5285                   | 1201                | 4324                   | 900                 | 2763                   | 451                 |
| D8.0 x 2R                           | 5195                       | 2041                | 4775                   | 1621                | 3213                   | 1020                | 2792                   | 2312                | 2312                   | 492                 |
| D10.0 x 2R                          | 3303                       | 1681                | 2522                   | 1140                | 1921                   | 661                 | 1621                   | 991                 | 991                    | 384                 |
| D12.0 x 2R                          | 2792                       | 1741                | 2072                   | 1020                | 1321                   | 570                 | 1081                   | 781                 | 781                    | 317                 |
| D8.0 x 3R                           | 5395                       | 2120                | 4958                   | 1684                | 3337                   | 1060                | 2900                   | 748                 | 2402                   | 511                 |
| D10.0 x 3R                          | 3430                       | 1746                | 2619                   | 1184                | 1995                   | 686                 | 1684                   | 592                 | 1029                   | 361                 |
| D12.0 x 3R                          | 2900                       | 1808                | 2151                   | 1060                | 1371                   | 592                 | 1123                   | 499                 | 810                    | 331                 |

Unit/單位: mm

產品規格表 **P139-140**  
Specification page

## ● P-SFUCRS 2 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                     |                     | ~HRC40                 |                     | ~HRC50                 |                     | ~HRC55                 |                     | ~HRC60                 |                     |
|-------------------------------------|----------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速     | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter × Radius<br>D × R | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D2.0 x 0.1R                         | 11200                      | 1050                | 9240                   | 770                 | 8820                   | 630                 | 6860                   | 525                 | 5040                   | 350                 |
| D2.0 x 0.2R                         | 11200                      | 1050                | 9240                   | 770                 | 8820                   | 630                 | 6860                   | 525                 | 5040                   | 350                 |
| D2.0 x 0.3R                         | 11200                      | 1050                | 9240                   | 770                 | 8820                   | 630                 | 6860                   | 525                 | 5040                   | 350                 |
| D3.0 x 0.1R                         | 9100                       | 1260                | 7700                   | 1050                | 6860                   | 840                 | 5740                   | 735                 | 5250                   | 350                 |
| D3.0 x 0.2R                         | 9100                       | 1260                | 7700                   | 1050                | 6860                   | 840                 | 5740                   | 735                 | 5250                   | 350                 |
| D3.0 x 0.3R                         | 9100                       | 1260                | 7700                   | 1050                | 6860                   | 840                 | 5740                   | 735                 | 5250                   | 350                 |
| D4.0 x 0.2R                         | 8750                       | 1400                | 7350                   | 1260                | 6510                   | 735                 | 5495                   | 595                 | 4760                   | 350                 |
| D4.0 x 0.3R                         | 8750                       | 1400                | 7350                   | 1260                | 6510                   | 735                 | 5495                   | 595                 | 4760                   | 350                 |
| D2.0 x 0.5R                         | 11200                      | 840                 | 10150                  | 770                 | 9100                   | 630                 | 7700                   | 525                 | 6440                   | 420                 |
| D3.0 x 0.5R                         | 9100                       | 1400                | 7700                   | 1260                | 6860                   | 1050                | 5740                   | 770                 | 5250                   | 350                 |
| D4.0 x 0.5R                         | 8750                       | 1400                | 7350                   | 1260                | 6510                   | 735                 | 5495                   | 595                 | 4760                   | 350                 |
| D6.0 x 0.5R                         | 8050                       | 2100                | 7000                   | 1820                | 6160                   | 1400                | 5040                   | 1050                | 3220                   | 525                 |
| D8.0 x 0.5R                         | 6055                       | 2380                | 5565                   | 1890                | 3745                   | 1190                | 3255                   | 840                 | 2695                   | 574                 |
| D10.0 x 0.5R                        | 3850                       | 1960                | 2940                   | 1330                | 2240                   | 770                 | 1890                   | 665                 | 1155                   | 406                 |
| D12.0 x 0.5R                        | 3255                       | 2030                | 2415                   | 1190                | 1540                   | 665                 | 1260                   | 560                 | 910                    | 371                 |
| D3.0 x 1R                           | 10465                      | 1610                | 8855                   | 1449                | 7889                   | 1208                | 6601                   | 886                 | 6038                   | 403                 |
| D4.0 x 1R                           | 10063                      | 1610                | 8453                   | 1450                | 7487                   | 846                 | 6320                   | 685                 | 5474                   | 403                 |
| D6.0 x 1R                           | 9258                       | 2415                | 8050                   | 2093                | 7084                   | 1610                | 5796                   | 1208                | 3703                   | 604                 |
| D8.0 x 1R                           | 6964                       | 2737                | 6400                   | 2174                | 4307                   | 1369                | 3744                   | 966                 | 3100                   | 660                 |
| D10.0 x 1R                          | 4428                       | 2240                | 3381                   | 1530                | 2576                   | 886                 | 2174                   | 765                 | 1329                   | 467                 |
| D12.0 x 1R                          | 3744                       | 2335                | 2778                   | 1369                | 1771                   | 998                 | 1449                   | 644                 | 1047                   | 427                 |
| D6.0 x 1.5R                         | 9660                       | 2520                | 8400                   | 2184                | 7392                   | 1680                | 6048                   | 1260                | 3864                   | 630                 |
| D8.0 x 1.5R                         | 7266                       | 2856                | 6778                   | 2268                | 4494                   | 1428                | 3906                   | 1008                | 3234                   | 689                 |
| D10.0 x 1.5R                        | 4620                       | 2352                | 3528                   | 1596                | 2688                   | 924                 | 2268                   | 798                 | 1386                   | 487                 |
| D12.0 x 1.5R                        | 3906                       | 2436                | 2898                   | 1428                | 1848                   | 798                 | 1512                   | 672                 | 1092                   | 445                 |
| D6.0 x 2R                           | 10465                      | 2730                | 9100                   | 2366                | 8088                   | 1820                | 6552                   | 1365                | 4186                   | 683                 |
| D8.0 x 2R                           | 7872                       | 3094                | 7235                   | 2457                | 4869                   | 1547                | 4232                   | 3504                | 3504                   | 746                 |
| D10.0 x 2R                          | 5005                       | 2548                | 3822                   | 1729                | 2912                   | 1001                | 2457                   | 1502                | 1502                   | 528                 |
| D12.0 x 2R                          | 4232                       | 2639                | 3140                   | 1547                | 2002                   | 865                 | 1638                   | 1183                | 1183                   | 482                 |
| D8.0 x 3R                           | 8175                       | 3213                | 7513                   | 2552                | 5056                   | 1607                | 4395                   | 1134                | 3640                   | 775                 |
| D10.0 x 3R                          | 5198                       | 2646                | 3969                   | 1796                | 3024                   | 1040                | 2552                   | 898                 | 1560                   | 548                 |
| D12.0 x 3R                          | 4395                       | 2741                | 3261                   | 1607                | 2079                   | 898                 | 1701                   | 756                 | 1229                   | 501                 |

產品規格表 **P141-142**  
Specification page

● P-SFUCRS 4 Flutes Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | ~HRC30                     |                     | ~HRC40                 |                     | ~HRC50                 |                     | ~HRC55                 |                     | ~HRC60                 |                     |
|-------------------------------------|----------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational speed<br>轉速     | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 | Rotational speed<br>轉速 | Feeding speed<br>進給 |
|                                     | Diameter × Radius<br>D × R | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          | mm/min.<br>mm/分        | RPM<br>轉/分          |
| D1.0 x 0.1R                         | 19800                      | 980                 | 17500                  | 850                 | 14500                  | 650                 | 12000                  | 560                 | 9800                   | 450                 |
| D1.0 x 0.2R                         | 19800                      | 980                 | 17500                  | 850                 | 14500                  | 650                 | 12000                  | 560                 | 9800                   | 450                 |
| D1.0 x 0.3R                         | 19800                      | 980                 | 17500                  | 850                 | 14500                  | 650                 | 12000                  | 560                 | 9800                   | 450                 |
| D1.5 x 0.2R                         | 17500                      | 1200                | 15200                  | 900                 | 13800                  | 700                 | 10500                  | 600                 | 8500                   | 500                 |
| D1.5 x 0.3R                         | 17500                      | 1200                | 15200                  | 900                 | 13800                  | 700                 | 10500                  | 600                 | 8500                   | 500                 |
| D2.0 x 0.1R                         | 16000                      | 1500                | 13200                  | 1100                | 12600                  | 900                 | 9800                   | 750                 | 7200                   | 500                 |
| D2.0 x 0.2R                         | 16000                      | 1500                | 13200                  | 1100                | 12600                  | 900                 | 9800                   | 750                 | 7200                   | 500                 |
| D2.0 x 0.3R                         | 16000                      | 1500                | 13200                  | 1100                | 12600                  | 900                 | 9800                   | 750                 | 7200                   | 500                 |
| D3.0 x 0.1R                         | 13000                      | 1800                | 11000                  | 1500                | 9800                   | 1200                | 8200                   | 1050                | 7500                   | 500                 |
| D3.0 x 0.2R                         | 13000                      | 1800                | 11000                  | 1500                | 9800                   | 1200                | 8200                   | 1050                | 7500                   | 500                 |
| D3.0 x 0.3R                         | 13000                      | 1800                | 11000                  | 1500                | 9800                   | 1200                | 8200                   | 1050                | 7500                   | 500                 |
| D4.0 x 0.2R                         | 12500                      | 2000                | 10500                  | 1800                | 9300                   | 1050                | 7850                   | 850                 | 6800                   | 500                 |
| D4.0 x 0.3R                         | 12500                      | 2000                | 10500                  | 1800                | 9300                   | 1050                | 7850                   | 850                 | 6800                   | 500                 |
| D2.0 x 0.5R                         | 16000                      | 1200                | 14500                  | 1100                | 13000                  | 900                 | 11000                  | 750                 | 9200                   | 600                 |
| D3.0 x 0.5R                         | 13000                      | 2000                | 11000                  | 1800                | 9800                   | 1500                | 8200                   | 1100                | 7500                   | 500                 |
| D4.0 x 0.5R                         | 12500                      | 2000                | 10500                  | 1800                | 9300                   | 1050                | 7850                   | 850                 | 6800                   | 500                 |
| D6.0 x 0.5R                         | 11500                      | 3000                | 10000                  | 2600                | 8800                   | 2000                | 7200                   | 1500                | 4600                   | 750                 |
| D8.0 x 0.5R                         | 8650                       | 3400                | 7950                   | 2700                | 5350                   | 1700                | 4650                   | 1200                | 3850                   | 820                 |
| D10.0 x 0.5R                        | 5500                       | 2800                | 4200                   | 1900                | 3200                   | 1100                | 2700                   | 950                 | 1650                   | 580                 |
| D12.0 x 0.5R                        | 4650                       | 2900                | 3450                   | 1700                | 2200                   | 950                 | 1800                   | 800                 | 1300                   | 530                 |
| D3.0 x 1R                           | 14950                      | 2300                | 12650                  | 2070                | 11270                  | 1725                | 9430                   | 1265                | 8625                   | 575                 |
| D4.0 x 1R                           | 14375                      | 2300                | 12075                  | 2072                | 10695                  | 1208                | 9028                   | 978                 | 7820                   | 575                 |
| D6.0 x 1R                           | 13225                      | 3450                | 11500                  | 2990                | 10120                  | 2300                | 8280                   | 1725                | 5290                   | 863                 |
| D8.0 x 1R                           | 9948                       | 3910                | 9143                   | 3105                | 6153                   | 1955                | 5348                   | 1380                | 4428                   | 943                 |
| D10.0 x 1R                          | 6325                       | 3200                | 4830                   | 2185                | 3680                   | 1265                | 3105                   | 1093                | 1898                   | 667                 |
| D12.0 x 1R                          | 5348                       | 3335                | 3968                   | 1955                | 2530                   | 1425                | 2070                   | 920                 | 1495                   | 610                 |
| D6.0 x 1.5R                         | 13800                      | 3600                | 12000                  | 3120                | 10560                  | 2400                | 8640                   | 1800                | 5520                   | 900                 |
| D8.0 x 1.5R                         | 10380                      | 4080                | 9540                   | 3240                | 6420                   | 2040                | 5580                   | 1440                | 4620                   | 984                 |
| D10.0 x 1.5R                        | 6600                       | 3360                | 5040                   | 2280                | 3840                   | 1320                | 3240                   | 1140                | 1980                   | 696                 |
| D12.0 x 1.5R                        | 5580                       | 3480                | 4140                   | 2040                | 2640                   | 1140                | 2160                   | 960                 | 1560                   | 636                 |
| D6.0 x 2R                           | 14950                      | 3900                | 13000                  | 3380                | 11440                  | 2600                | 9360                   | 1950                | 5980                   | 975                 |
| D8.0 x 2R                           | 11245                      | 4420                | 10335                  | 3510                | 6955                   | 2210                | 6045                   | 5005                | 5005                   | 1066                |
| D10.0 x 2R                          | 7150                       | 3640                | 5460                   | 2470                | 4160                   | 1430                | 3510                   | 2145                | 2145                   | 754                 |
| D12.0 x 2R                          | 6045                       | 3770                | 4485                   | 2210                | 2860                   | 1235                | 2340                   | 1690                | 1690                   | 689                 |
| D8.0 x 3R                           | 11678                      | 4590                | 10733                  | 3645                | 7223                   | 2295                | 6278                   | 1620                | 5200                   | 1107                |
| D10.0 x 3R                          | 7425                       | 3780                | 5670                   | 2565                | 4320                   | 1485                | 3645                   | 1283                | 2228                   | 783                 |
| D12.0 x 3R                          | 6278                       | 3915                | 4658                   | 2295                | 2970                   | 1283                | 2340                   | 1080                | 1755                   | 716                 |

Unit/單位: mm

產品規格表 **P143-149**

Specification page

## ● P-SFUCR Side Milling 側面切削

| Work Material<br>被削材               | SS400. AISI 1050. SCM<br>鑄鐵 FC250等<br>一般構造鋼. 碳素鋼. ~HRC30 |                                       | AISI H13. AISI D2等<br>合金鋼. 工具鋼<br>調質鋼HRC30~35 |                                       | SUS304. SKD<br>調質鋼HRC38~45    |                                       | SKD61等<br>淬火鋼HRC45~50                                 |                                       |
|------------------------------------|--|---------------------------------------|---|---------------------------------------|-------------------------------|---------------------------------------|---|---------------------------------------|
|                                    | Diameter<br>直徑<br>(mm)                                   | Speed<br>迴轉速<br>( $\text{min}^{-1}$ ) | Feed Rate<br>進給速度<br>(mm/min)                 | Speed<br>迴轉速<br>( $\text{min}^{-1}$ ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>( $\text{min}^{-1}$ ) | Feed Rate<br>進給速度<br>(mm/min)                         | Speed<br>迴轉速<br>( $\text{min}^{-1}$ ) |
| 6                                  | 4300   | 780                                   | 3200  | 580                                   | 2200                          | 380                                   | 1100  | 160                                   |
| 8                                  | 3200   | 780                                   | 2400  | 580                                   | 1600                          | 380                                   | 800   | 160                                   |
| 10                                 | 2600   | 780                                   | 1900  | 580                                   | 1300                          | 380                                   | 650   | 160                                   |
| 12                                 | 2100   | 780                                   | 1600  | 580                                   | 1100                          | 380                                   | 530   | 160                                   |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Side milling (側銑)</p> <p>Ae: 0.1 D Ap: 1.5 D</p>     |                                       |   |                                       |                               |                                       | <p>*Side milling (側銑)</p> <p>Ae: 0.05 D Ap: 1.0 D</p> |                                       |

產品規格表 **P150**  
Specification page

## ● DAB Series Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | Below HRC30            |                     | HRC30~45               |                     | HRC45~65               |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 |
| Radius of Ball Nose                 | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      |
| D0.5R                               | 25600                  | 1035                | 20800                  | 960                 | 16800                  | 912                 |
| D1.0R                               | 23680                  | 1680                | 17840                  | 1392                | 14400                  | 1200                |
| D1.5R                               | 19200                  | 2640                | 14400                  | 1920                | 12480                  | 1200                |
| D2.0R                               | 18400                  | 3840                | 13600                  | 1800                | 11200                  | 1632                |
| D2.5R                               | 16000                  | 4800                | 12480                  | 2400                | 8800                   | 1440                |
| D3.0R                               | 16000                  | 4800                | 12160                  | 2280                | 8000                   | 1320                |
| D4.0R                               | 10400                  | 5280                | 6400                   | 2880                | 4000                   | 1560                |
| D5.0R                               | 6080                   | 4560                | 3200                   | 2160                | 2560                   | 1200                |
| D6.0R                               | 5120                   | 4320                | 3200                   | 2400                | 1920                   | 1080                |

產品規格表 **P151**  
Specification page

## ● DAC Series Cutting Condition 標準切削

| Working material hardness<br>被切削材硬度 | Below ~HRC30           |                     | ~HRC40                 |                     | ~HRC50                 |                     | ~HRC55                 |                     | ~HRC60                 |                     |
|-------------------------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|------------------------|---------------------|
|                                     | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 |
| Diameter X Radius<br>D X R          | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      | RPM<br>轉/分             | mm/min<br>mm/分      |
| D1.0 X 0.1R                         | 11880                  | 441                 | 10500                  | 383                 | 8700                   | 292.5               | 7200                   | 252                 | 5880                   | 202.5               |
| D1.0 X 0.2R                         | 11880                  | 441                 | 10500                  | 383                 | 8700                   | 390                 | 7200                   | 252                 | 5880                   | 202.5               |
| D1.0 X 0.3R                         | 11880                  | 441                 | 10500                  | 383                 | 8700                   | 390                 | 7200                   | 252                 | 5880                   | 202.5               |
| D1.5 X 0.2R                         | 10500                  | 540                 | 9120                   | 405                 | 8280                   | 420                 | 6300                   | 270                 | 5100                   | 225                 |
| D1.5 X 0.3R                         | 10500                  | 540                 | 9120                   | 405                 | 8280                   | 420                 | 6300                   | 270                 | 5100                   | 225                 |
| D2.0 X 0.1R                         | 9600                   | 675                 | 7920                   | 495                 | 7560                   | 540                 | 5880                   | 338                 | 4320                   | 225                 |
| D2.0 X 0.2R                         | 9600                   | 675                 | 7920                   | 495                 | 7560                   | 540                 | 5880                   | 338                 | 4320                   | 225                 |
| D2.0 X 0.3R                         | 9600                   | 675                 | 7920                   | 495                 | 7560                   | 540                 | 5880                   | 338                 | 4320                   | 225                 |
| D2.0 X 0.5R                         | 9600                   | 540                 | 8700                   | 495                 | 7800                   | 540                 | 6000                   | 338                 | 5520                   | 270                 |
| D3.0 X 0.1R                         | 7800                   | 810                 | 6600                   | 675                 | 5880                   | 720                 | 4920                   | 473                 | 4500                   | 225                 |
| D3.0 X 0.2R                         | 7800                   | 810                 | 6600                   | 675                 | 5880                   | 720                 | 4920                   | 473                 | 4500                   | 225                 |
| D3.0 X 0.3R                         | 7800                   | 810                 | 6600                   | 675                 | 5880                   | 720                 | 4920                   | 473                 | 4500                   | 225                 |
| D3.0 X 0.5R                         | 7800                   | 900                 | 6600                   | 810                 | 5880                   | 900                 | 4920                   | 495                 | 4500                   | 225                 |
| D3.0 X 1R                           | 8970                   | 1035                | 7590                   | 932                 | 6762                   | 1035                | 5658                   | 569                 | 5175                   | 259                 |
| D4.0 X 0.2R                         | 7500                   | 900                 | 6300                   | 810                 | 5580                   | 630                 | 4710                   | 383                 | 4080                   | 225                 |
| D4.0 X 0.3R                         | 7500                   | 900                 | 6300                   | 810                 | 5580                   | 630                 | 4710                   | 383                 | 4080                   | 225                 |
| D4.0 X 0.5R                         | 7500                   | 900                 | 6300                   | 810                 | 5580                   | 630                 | 4710                   | 383                 | 4080                   | 225                 |
| D4.0 X 1R                           | 8625                   | 1035                | 7245                   | 932                 | 6417                   | 725                 | 5417                   | 440                 | 4692                   | 259                 |
| D6.0 X 0.5R                         | 6900                   | 1350                | 6000                   | 1170                | 5280                   | 1200                | 4320                   | 675                 | 2760                   | 338                 |
| D6.0 X 1R                           | 7935                   | 1553                | 6900                   | 1346                | 6072                   | 1380                | 4968                   | 776                 | 3174                   | 389                 |
| D6.0 X 1.5R                         | 6900                   | 1620                | 7200                   | 1404                | 6336                   | 1440                | 5184                   | 810                 | 3312                   | 405                 |
| D6.0 X 2R                           | 8970                   | 1755                | 7800                   | 1521                | 6864                   | 1560                | 5616                   | 878                 | 3588                   | 439                 |
| D8.0 X 0.5R                         | 5190                   | 1530                | 4770                   | 1215                | 3210                   | 1020                | 2790                   | 540                 | 2310                   | 369                 |
| D8.0 X 1R                           | 5969                   | 1760                | 5486                   | 1397                | 3692                   | 1173                | 3209                   | 621                 | 2657                   | 425                 |
| D8.0 X 1.5R                         | 6228                   | 1836                | 5724                   | 1458                | 3852                   | 1224                | 3348                   | 648                 | 2772                   | 443                 |
| D8.0 X 2R                           | 6747                   | 1989                | 6201                   | 1580                | 4173                   | 1326                | 3627                   | 729                 | 3003                   | 480                 |
| D8.0 X 3R                           | 7007                   | 2066                | 6440                   | 1640                | 4334                   | 1377                | 3767                   | 729                 | 3120                   | 498                 |
| D10.0 X 0.5R                        | 3300                   | 1260                | 2520                   | 855                 | 1920                   | 660                 | 1620                   | 428                 | 990                    | 261                 |
| D10.0 X 1R                          | 3795                   | 1440                | 2898                   | 983                 | 2208                   | 759                 | 1863                   | 492                 | 1139                   | 300                 |
| D10.0 X 1.5R                        | 3960                   | 1512                | 3024                   | 1026                | 2304                   | 792                 | 1944                   | 513                 | 1188                   | 314                 |
| D10.0 X 2R                          | 4290                   | 1638                | 3276                   | 1112                | 2496                   | 858                 | 2106                   | 567                 | 1287                   | 339                 |
| D10.0 X 3R                          | 4455                   | 1701                | 3402                   | 1154                | 2592                   | 891                 | 2187                   | 578                 | 1337                   | 353                 |
| D12.0 X 0.5R                        | 2790                   | 1305                | 2070                   | 765                 | 1320                   | 570                 | 1080                   | 360                 | 780                    | 239                 |
| D12.0 X 1R                          | 3209                   | 1501                | 2381                   | 880                 | 1518                   | 657                 | 1242                   | 414                 | 918                    | 275                 |
| D12.0 X 1.5R                        | 3348                   | 1566                | 2484                   | 918                 | 1584                   | 684                 | 1296                   | 432                 | 936                    | 287                 |
| D12.0 X 2R                          | 3627                   | 1697                | 2691                   | 995                 | 1716                   | 741                 | 1404                   | 462                 | 1014                   | 310                 |
| D12.0 X 3R                          | 3767                   | 1762                | 2795                   | 1033                | 1782                   | 770                 | 1458                   | 486                 | 1053                   | 323                 |

Unit/單位: mm

產品規格表 **P154-155**  
Specification page

## • AP Series Cutting Condition 標準切削

| Working material<br>被切削材           | ACRYLIC<br>壓克力         |                     |          |            | ALUMINIUM-IS<8%<br>鋁合金 |                     |          |            |
|------------------------------------|------------------------|---------------------|----------|------------|------------------------|---------------------|----------|------------|
| Diameter<br>直徑<br>(mm)             | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Vc<br>切速 | Fz<br>每刃進給 | Rotational Speed<br>轉速 | Feeding Speed<br>進給 | Vc<br>切速 | Fz<br>每刃進給 |
| 2                                  | 32000                  | 2200                | 200      | 0.069      | 23000                  | 1500                | 145      | 0.065      |
| 3                                  | 25000                  | 2400                | 235      | 0.096      | 18000                  | 1700                | 170      | 0.094      |
| 4                                  | 20000                  | 2400                | 250      | 0.12       | 15000                  | 1800                | 190      | 0.12       |
| 5                                  | 15000                  | 2200                | 235      | 0.147      | 12000                  | 1800                | 190      | 0.15       |
| 6                                  | 13500                  | 2300                | 255      | 0.17       | 10000                  | 1800                | 190      | 0.18       |
| 8                                  | 10000                  | 2400                | 250      | 0.24       | 7800                   | 1900                | 195      | 0.244      |
| 10                                 | 8000                   | 2400                | 250      | 0.3        | 6000                   | 2000                | 190      | 0.333      |
| 12                                 | 6700                   | 2300                | 255      | 0.343      | 5000                   | 2200                | 190      | 0.44       |
|                                    |                        |                     |          |            |                        |                     |          |            |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | Ae=1D<br>Ap=1.5D       |                     |          |            |                        |                     |          |            |



AE5

產品規格表 P156-157

Specification page

AET

產品規格表 P160-161

Specification page

## • AE5,AET 2T Series Side Milling 側銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 140m/min                             |                               | 380m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 14,770                               | 2,100                         | 39,910   | 6,380                         |
| 4                                 | 11,080                               | 1,580                         | 29,940   | 4,790                         |
| 5                                 | 8,860                                | 1,260                         | 23,950   | 3,830                         |
| 6                                 | 7,380                                | 1,060                         | 19,960   | 3,190                         |
| 8                                 | 5,550                                | 790                           | 15,000   | 2,400                         |
| 10                                | 4,430                                | 630                           | 11,980   | 1,920                         |
| 12                                | 3,690                                | 530                           | 9,980  | 1,600                         |
| 16                                | 2,770                                | 400                           | 7,490  | 1,200                         |
| 20                                | 2,220                                | 320                           | 5,980  | 960                           |
| 25                                | 1,780                                | 260                           | 4,790  | 770                           |

|                                    |                            |      |      |      |
|------------------------------------|----------------------------|------|------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑)         |      |      |      |
|                                    | <p>Ap=2.0D<br/>Ae=0.5D</p> |      |      |      |
|                                    | V線速度                       | 140  | V線速度 | 380  |
|                                    | Z刃數                        | 2    | Z刃數  | 2    |
|                                    | Fz                         | 0.07 | Fz   | 0.08 |

## • AE5,AET 2T Series Slotting 溝銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 90m/min                              |                               | 310m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 9,740                                | 700                           | 32,910   | 2630                          |
| 4                                 | 7,300                                | 520                           | 24,680   | 1970                          |
| 5                                 | 5,850                                | 420                           | 19,750   | 1580                          |
| 6                                 | 4,870                                | 350                           | 16,450   | 1320                          |
| 8                                 | 3,660                                | 260                           | 12,340   | 990                           |
| 10                                | 2,960                                | 210                           | 9,870  | 790                           |
| 12                                | 2,440                                | 180                           | 8,230  | 660                           |
| 16                                | 1,820                                | 130                           | 6,170  | 490                           |
| 20                                | 1,460                                | 100                           | 4,940  | 400                           |
| 25                                | 1,170                                | 90                            | 3,950  | 320                           |

|                                    |                            |      |      |      |
|------------------------------------|----------------------------|------|------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)             |      |      |      |
|                                    | <p>Ap=2.0D<br/>Ae=1.0D</p> |      |      |      |
|                                    | V線速度                       | 90   | V線速度 | 310  |
|                                    | Z刃數                        | 2    | Z刃數  | 2    |
|                                    | Fz                         | 0.04 | Fz   | 0.04 |

**AEL5**

產品規格表 **P156-157**

Specification page

**ALET**

產品規格表 **P164**

Specification page

## ● AEL5,ALET 2T Series Side Milling 側銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 70m/min                              |                               | 190m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 7,540                                | 650                           | 20,380   | 1,960                         |
| 4                                 | 5,660                                | 480                           | 15,290   | 1,460                         |
| 5                                 | 4,530                                | 390                           | 12,230   | 1,180                         |
| 6                                 | 3,770                                | 320                           | 10,190   | 980                           |
| 8                                 | 2,780                                | 240                           | 7,500  | 720                           |
| 10                                | 2,260                                | 190                           | 6,110  | 580                           |
| 12                                | 1,890                                | 160                           | 5,100  | 490                           |
| 16                                | 1,420                                | 120                           | 3,820  | 370                           |
| 20                                | 1,130                                | 100                           | 3,060  | 300                           |
| 25                                | 900                                  | 80                            | 2,450  | 230                           |

|                                    |   |      |      |      |
|------------------------------------|---|------|------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑) <p style="text-align: right;">Ap=4.5D<br/>Ae=0.05D</p> |      |      |      |
|                                    | V線速度  | 70   | V線速度 | 190  |
|                                    | Z刃數   | 2    | Z刃數  | 2    |
|                                    | Fz  | 0.04 | Fz   | 0.05 |

1. When Slotting, reduce the feed by 60% from above values.
  2. Length of overhang is 4 times dia. as standard. When it is longer then 4 times dia., follow figures of above table.
  3. Recommend Oil-mist coolant or Air blow.
  4. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
  5. Use a rigid machine and holder.
- 
1. 溝加工時之進給速度，請設定為上述值之 60%。
  2. 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
  3. 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
  4. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
  5. 請使用較具剛性之機械設備及夾頭。

**AEL5**

產品規格表 **P156-157**

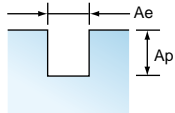
Specification page

**ALET**

產品規格表 **P164**

Specification page

## • AEL5,ALET 2T Series Slotting 溝銑切削

| Work Material<br>被削材               | COPPER,COPPER ALLOY<br>銅, 銅合金   |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                               |
|------------------------------------|---|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V)  | 50m/min   |                               | 160m/min   |                               |
| Diameter<br>直徑<br>(mm)             | Speed<br>迴轉數<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                  | 5,030   | 220                           | 16,990   | 820                           |
| 4                                  | 3,770   | 160                           | 12,740   | 610                           |
| 5                                  | 3,020   | 130                           | 10,190   | 490                           |
| 6                                  | 2,510   | 110                           | 8,490  | 410                           |
| 8                                  | 1,890   | 80                            | 6,370  | 310                           |
| 10                                 | 1,480   | 60                            | 5,100  | 240                           |
| 12                                 | 1,260   | 60                            | 4,250  | 200                           |
| 16                                 | 940   | 40                            | 3,180  | 150                           |
| 20                                 | 750   | 30                            | 2,550  | 120                           |
| 25                                 | 600   | 20                            | 2,040  | 100                           |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)<br> |                               |  |                               |
|                                    | V線速度  | 50                            | V線速度   | 160                           |
|                                    | Z刃數   | 2                             | Z刃數  | 2                             |
|                                    | Fz  | 0.02                          | Fz   | 0.02                          |

1. When Slotting, reduce the feed by 60% from above values.
  2. Length of overhang is 4 times dia. as standard. When it is longer then 4 times dia., follow figures of above table.
  3. Recommend Oil-mist coolant or Air blow.
  4. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
  5. Use a rigid machine and holder.
1. 溝加工時之進給速度，請設定為上述值之 60%。
  2. 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
  3. 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
  4. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
  5. 請使用較具剛性之機械設備及夾頭。

AE5

產品規格表 P158-159  
Specification page

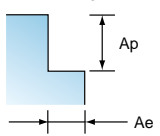
AET

產品規格表 P162-163  
Specification page

## ● AE5,AET 3T Series Side Milling 側銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si1 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 140m/min                             |                               | 380m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 14,770                               | 3,160                         | 39,910   | 9,580                         |
| 4                                 | 11,080                               | 2,370                         | 29,940   | 7,180                         |
| 5                                 | 8,860                                | 1,900                         | 23,950   | 5,750                         |
| 6                                 | 7,380                                | 1,580                         | 19,960   | 4,790                         |
| 8                                 | 5,550                                | 1,190                         | 15,000   | 3,600                         |
| 10                                | 4,430                                | 940                           | 11,980   | 2,870                         |
| 12                                | 3,690                                | 790                           | 9,980  | 2,390                         |
| 16                                | 2,770                                | 590                           | 7,490  | 1,800                         |
| 20                                | 2,220                                | 470                           | 5,980  | 1,440                         |
| 25                                | 1,780                                | 380                           | 4,790  | 1,150                         |

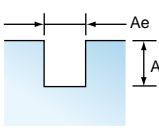
  

|                                    |   |      |      |      |
|------------------------------------|---|------|------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑)  <p>Ap=2.0D<br/>Ae=0.5D</p> |      |      |      |
|                                    | V線速度  | 140  | V線速度 | 380  |
|                                    | Z刃數   | 3    | Z刃數  | 3    |
|                                    | Fz  | 0.07 | Fz   | 0.08 |

## ● AE5,AET 3T Series Slotting 溝銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si1 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 90m/min                              |                               | 310m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 9,740                                | 1,040                         | 32,910   | 3950                          |
| 4                                 | 7,300                                | 780                           | 24,680   | 2960                          |
| 5                                 | 5,850                                | 620                           | 19,750   | 2370                          |
| 6                                 | 4,870                                | 520                           | 16,450   | 1970                          |
| 8                                 | 3,660                                | 390                           | 12,340   | 1480                          |
| 10                                | 2,960                                | 320                           | 9,870  | 1180                          |
| 12                                | 2,440                                | 260                           | 8,230  | 990                           |
| 16                                | 1,820                                | 190                           | 6,170  | 740                           |
| 20                                | 1,460                                | 150                           | 4,940  | 590                           |
| 25                                | 1,170                                | 130                           | 3,950  | 470                           |

|                                    |   |      |      |      |
|------------------------------------|---|------|------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)  <p>Ap=2.0D<br/>Ae=1.0D</p> |      |      |      |
|                                    | V線速度  | 90   | V線速度 | 310  |
|                                    | Z刃數   | 3    | Z刃數  | 3    |
|                                    | Fz  | 0.04 | Fz   | 0.04 |

**AEL5**

產品規格表 **P158-159**  
Specification page

**ALET**

產品規格表 **P165**  
Specification page

## • AEL5,ALET 3T Series Side Milling 側銑切削

| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 70m/min                              |                               | 190m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 7,540                                | 970                           | 20,380   | 2,940                         |
| 4                                 | 5,660                                | 730                           | 15,290   | 2,200                         |
| 5                                 | 4,530                                | 580                           | 12,230   | 1,760                         |
| 6                                 | 3,770                                | 480                           | 10,190   | 1,460                         |
| 8                                 | 2,780                                | 360                           | 7,500  | 1,080                         |
| 10                                | 2,260                                | 290                           | 6,110  | 880                           |
| 12                                | 1,890                                | 240                           | 5,100  | 740                           |
| 16                                | 1,420                                | 180                           | 3,820  | 550                           |
| 20                                | 1,130                                | 140                           | 3,060  | 440                           |
| 25                                | 900                                  | 120                           | 2,450  | 350                           |

| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑) |     |      |     |
|------------------------------------|--------------------|-----|------|-----|
|                                    |                    |     |      |     |
|                                    | V線速度               | 70  | V線速度 | 190 |
| Z刃數                                | 3                  | Z刃數 | 3    |     |
| Fz                                 | 0.04               | Fz  | 0.05 |     |

## • AEL5,ALET 3T Series Slotting 溝銑切削

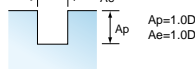
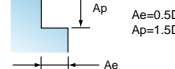
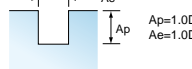
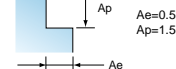
| Work Material<br>被削材              | COPPER,COPPER ALLOY<br>銅·銅合金         |                               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                               |
|-----------------------------------|--------------------------------------|-------------------------------|--|-------------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) | 50m/min                              |                               | 160m/min   |                               |
| Diameter<br>直徑<br>(mm)            | Speed<br>迴轉數<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉數<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) |
| 3                                 | 5,030                                | 320                           | 16,990   | 1220                          |
| 4                                 | 3,770                                | 240                           | 12,740   | 920                           |
| 5                                 | 3,020                                | 190                           | 10,190   | 730                           |
| 6                                 | 2,510                                | 160                           | 8,490  | 610                           |
| 8                                 | 1,890                                | 120                           | 6,370  | 460                           |
| 10                                | 1,480                                | 100                           | 5,100  | 370                           |
| 12                                | 1,260                                | 80                            | 4,250  | 310                           |
| 16                                | 940                                  | 60                            | 3,180  | 230                           |
| 20                                | 750                                  | 50                            | 2,550  | 180                           |
| 25                                | 600                                  | 40                            | 2,040  | 150                           |

| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑) |     |      |     |
|------------------------------------|----------------|-----|------|-----|
|                                    |                |     |      |     |
|                                    | V線速度           | 50  | V線速度 | 160 |
| Z刃數                                | 3              | Z刃數 | 3    |     |
| Fz                                 | 0.02           | Fz  | 0.02 |     |

產品規格表 **P166-167**  
Specification page

## • ANT 3 Flutes 標準切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金  |   | Aluminum alloy<br>casting<Sil 13%<br>鋁合金   |   |
|----------------------|--|---|--|---|
| Velocity             | 250-400 mm/min   |   | 150-250 mm/min   |   |
| Type No.<br>型號       | f (mm / Tooth)   |   |  |   |
| ANT 0603             | 0.043  | 0.054   | 0.036  | 0.045   |
| ANT 0803             | 0.055  | 0.069   | 0.047  | 0.058   |
| ANT 1003             | 0.068  | 0.085   | 0.057  | 0.071   |
| ANT 1203             | 0.080  | 0.100   | 0.066  | 0.083   |
| ANT 1403             | 0.092  | 0.115   | 0.077  | 0.096   |
| ANT 1603             | 0.105  | 0.131   | 0.087  | 0.109   |
| ANT 2003             | 0.130  | 0.162   | 0.108  | 0.135   |
| ANT 2503             | 0.160  | 0.200   | 0.134  | 0.167   |
| Depth of cut<br>加工深度 | <p>*Slotting (溝銑)</p>  <p>Ap=1.0D<br/>Ae=1.0D</p> | <p>*Side milling (側銑)</p>  <p>Ap<br/>Ae=0.5D<br/>Ap=1.5D</p> | <p>*Slotting (溝銑)</p>  <p>Ap<br/>Ae=1.0D<br/>Ae=1.0D</p> | <p>*Side milling (側銑)</p>  <p>Ap<br/>Ae=0.5D<br/>Ap=1.5D</p> |

產品規格表 **P168-169**  
Specification page

## • CE 2T Series Side Milling 側銑切削

| Work Material<br>被削材              |                     | COPPER, COPPER ALLOY<br>銅, 銅合金    |                            | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si13%<br>鋁合金 |                            |
|-----------------------------------|---------------------|-----------------------------------|----------------------------|--|----------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) |                     | 140m/min                          |                            | 380m/min   |                            |
| TYPE NO.                          | Diameter<br>直徑 (mm) | Speed<br>迴轉數 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉數 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) |
| CE0302                            | 3                   | 14,770                            | 1,060                      | 39,910   | 3,190                      |
| CE0402                            | 4                   | 11,080                            | 790                        | 29,940   | 2,390                      |
| CE0502                            | 5                   | 8,860                             | 630                        | 23,950   | 1,920                      |
| CE0602                            | 6                   | 7,380                             | 530                        | 19,960   | 1,600                      |
| CE0802                            | 8                   | 5,550                             | 400                        | 15,000   | 1,200                      |
| CE1002                            | 10                  | 4,430                             | 320                        | 11,980   | 960                        |
| CE1202                            | 12                  | 3,690                             | 260                        | 9,980  | 800                        |
| CE1602                            | 16                  | 2,770                             | 200                        | 7,490  | 600                        |
| CE2002                            | 20                  | 2,220                             | 160                        | 5,980  | 480                        |

| Depth of cut<br>切削基準量 (D=直徑Dia) |  | *Side milling (側銑)         |      |      |      |
|---------------------------------|--|----------------------------|------|------|------|
|                                 |  | <p>Ap=2.0D<br/>Ae=0.5D</p> |      |      |      |
|                                 |  | V線速度                       | 140  | V線速度 | 380  |
|                                 |  | Z刀數                        | 2    | Z刀數  | 2    |
|                                 |  | Fz                         | 0.04 | Fz   | 0.04 |

## • CE 2T Series Slotting 溝銑切削

| Work Material<br>被削材              |                     | COPPER, COPPER ALLOY<br>銅, 銅合金    |                            | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si13%<br>鋁合金 |                            |
|-----------------------------------|---------------------|-----------------------------------|----------------------------|--|----------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) |                     | 90m/min                           |                            | 310m/min   |                            |
| TYPE NO.                          | Diameter<br>直徑 (mm) | Speed<br>迴轉數 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉數 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) |
| CE0302                            | 3                   | 9,740                             | 350                        | 32,910   | 1320                       |
| CE0402                            | 4                   | 7,300                             | 260                        | 24,680   | 990                        |
| CE0502                            | 5                   | 5,850                             | 210                        | 19,750   | 790                        |
| CE0602                            | 6                   | 4,870                             | 180                        | 16,450   | 660                        |
| CE0802                            | 8                   | 3,660                             | 130                        | 12,340   | 490                        |
| CE1002                            | 10                  | 2,960                             | 100                        | 9,870  | 390                        |
| CE1202                            | 12                  | 2,440                             | 90                         | 8,230  | 330                        |
| CE1602                            | 16                  | 1,820                             | 60                         | 6,170  | 250                        |
| CE2002                            | 20                  | 1,460                             | 60                         | 4,940  | 200                        |

| Depth of cut<br>切削基準量 (D=直徑Dia) |  | *Slotting (溝銑)             |      |      |      |
|---------------------------------|--|----------------------------|------|------|------|
|                                 |  | <p>Ap=2.0D<br/>Ae=1.0D</p> |      |      |      |
|                                 |  | V線速度                       | 90   | V線速度 | 310  |
|                                 |  | Z刀數                        | 2    | Z刀數  | 2    |
|                                 |  | Fz                         | 0.02 | Fz   | 0.02 |

CEL

SULNT

產品規格表 **P170**

Specification page

產品規格表 **P202-203**

Specification page

## • CEL,SULNT 2 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材   |                            | Carbon Steels, Alloy Steels<br>Prehardened Steels<br>S50C, SCM, SKD, SUS, HPM,<br>NAK<br>碳素鋼, 合金鋼, 調質鋼 |                               | Aluminum<br>鋁                        |                               | Copper<br>銅                          |                               | Plastics<br>塑膠                       |                               |
|------------------------|----------------------------|--|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度  |                            | 30~80m/min   |                               | 100~200m/min                         |                               | 50~150m/min                          |                               | 50~80m/min                           |                               |
| Diameter<br>(mm)<br>直徑 | Ad Depth<br>of cut<br>(mm) | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| 0.2                    | 0.002~0.01                 | 47,800~  | 200~400                       | 50,000~                              | 200~400                       | 50,000~                              | 200~400                       | 50,000~                              | 200~400                       |
| 0.3                    | 0.002~0.02                 | 31,800~  | 200~600                       | 50,000~                              | 200~600                       | 50,000~                              | 300~600                       | 50,000~                              | 200~600                       |
| 0.4                    | 0.002~0.02                 | 23,900~  | 200~800                       | 50,000~                              | 200~800                       | 39,800~                              | 300~800                       | 39,800~                              | 200~800                       |
| 0.5                    | 0.001~0.04                 | 19,100~  | 200~1,000                     | 50,000~                              | 200~1,000                     | 31,800~                              | 300~1,000                     | 31,800~                              | 200~1,000                     |
| 1                      | 0.002~0.05                 | 9,600~25,500   | 300~1,300                     | 31,800~                              | 300~2,600                     | 15,900~47,800                        | 450~1,950                     | 15,900~25,500                        | 300~1,300                     |
| 1.5                    | 0.002~0.1                  | 6,400~17,000   | 250~900                       | 21,200~42,500                        | 250~1,800                     | 10,600~31,800                        | 375~1,350                     | 10,600~17,000                        | 250~900                       |
| 2                      | 0.003~0.2                  | 4,800~12,700   | 250~700                       | 15,900~31,800                        | 250~1,400                     | 8,000~23,900                         | 375~1,050                     | 8,000~12,700                         | 250~700                       |
| 2.5                    | 0.01~0.4                   | 3,800~10,200   | 200~500                       | 12,700~25,500                        | 200~1,000                     | 6,400~19,100                         | 300~750                       | 6,400~10,200                         | 200~500                       |
| 3                      | 0.012~0.6                  | 3,200~8,500  | 200~500                       | 10,600~21,200                        | 200~1,000                     | 5,300~15,900                         | 300~750                       | 5,300~8,500                          | 200~500                       |

1. Adjust depth of cut according to effective length.
2. When under 20 (effective length / diameter), refer to the conditions listed above.
3. Use cutting fluid with retardant.
4. Recommend reciprocating cutting.

1. 請參考刀具之有效長，來調整切削量及迴轉數，床台進給速度。
2. 上述條件為 L1(有效長)/D(刀徑) ≤ 20 為基準，超出上述場合時；請大幅調整切削條件。
3. 請使用不容易冒煙之切削油劑。
4. 請使用往復方式進行切削。



ACBL

產品規格表 **P173**  
Specification page

SULNBT

產品規格表 **P212-213**  
Specification page

## ● ACBL,SULNBT 2 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材              |                            | Carbon Steels<br>S50C(~225HB)<br>碳素鋼  |                               | Alloy Steels<br>SCM, SK, SUS<br>(225~325HB)<br>合金鋼 |                               | Prehardened Steels<br>Hardened steels<br>NAK.SKD HRC30~45<br>調質鋼 |                               | Hardened steels<br>SKD11.61.SKT<br>HRC40~50 調質鋼 |                               |
|-----------------------------------|----------------------------|---|-------------------------------|--|-------------------------------|--|-------------------------------|---|-------------------------------|
| Cutting Speed<br>切削速度             |                            | 50~65m/min  |                               | 40~55m/min   |                               | 30~50m/min   |                               | 30~40m/min                                      |                               |
| R                                 | Ad<br>Depth of cut<br>(mm) | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數               | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數                             | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>(min <sup>-1</sup> )<br>迴轉數            | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.25R                            | 0.003~0.01                 | 32,000  | 640                           | 32,000   | 640                           | 26,000   | 300                           | 20,000  | 240                           |
| D0.3R                             | 0.006~0.03                 | 32,000  | 830                           | 27,000   | 700                           | 21,000   | 340                           | 16,000  | 260                           |
| D0.5R                             | 0.005~0.08                 | 19,000  | 870                           | 16,000   | 740                           | 13,000   | 420                           | 10,000  | 320                           |
| D0.75R                            | 0.06~0.12                  | 13,000  | 940                           | 10,500   | 760                           | 8,500  | 440                           | 6,500   | 340                           |
| D1R                               | 0.03~0.21                  | 10,000  | 1,000                         | 8,000  | 800                           | 6,000  | 420                           | 5,000   | 350                           |
| D1.5R                             | 0.03~0.23                  | 6,600   | 730                           | 5,300  | 580                           | 4,000  | 310                           | 3,300   | 260                           |
| D2R                               | 0.01~0.28                  | 5,000   | 660                           | 4,000  | 530                           | 3,000  | 260                           | 2,500   | 230                           |
| Depth of cut<br>(R:球頭半徑)<br>切削量基準 |                            | <p> <math>\leq 0.1R (R \leq 1)</math><br/> <math>\leq 0.2R (R &gt; 1)</math> </p> |                               |  |                               |  |                               |   |                               |

1. Use a rigid machine and holder.
2. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
3. Use cutting fluid with retardant.

1. 請使用較具剛性之機械設備及夾頭。
2. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
3. 請使用不容易冒煙之切削油劑。

**AUE**

產品規格表 **P174**  
Specification page

**AUR**

產品規格表 **P176**  
Specification page

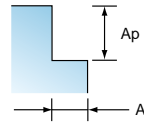
**S-AUE**

產品規格表 **P178**  
Specification page

## • AUE,AUR,S-AUE Series 3 Flutes Side Milling 側銑切削

| Work Material<br>被削材              |                     | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                            | Copper<br>銅                       |                            |
|-----------------------------------|---------------------|--|----------------------------|-----------------------------------|----------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) |                     | 240m/min   |                            | 87m/min                           |                            |
| TYPE NO.                          | Diameter<br>直徑 (mm) | Speed<br>迴轉數 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉數 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) |
| AUE0253                           | 2.5                 | 30,000   | 2,600                      | 11,000                            | 800                        |
| AUE0303                           | 3                   | 25,000   | 2,900                      | 9,250                             | 1,000                      |
| AUE0403                           | 4                   | 18,750   | 3,300                      | 6,950                             | 1,300                      |
| AUE0503                           | 5                   | 15,000   | 3,700                      | 5,550                             | 1,600                      |
| AUE0603                           | 6                   | 12,500   | 4,150                      | 4,650                             | 2,000                      |
| AUE0803                           | 8                   | 9,400  | 3,150                      | 3,500                             | 1,520                      |
| AUE1003                           | 10                  | 7,500  | 2,500                      | 2,800                             | 1,200                      |
| AUE1203                           | 12                  | 6,250  | 2,100                      | 2,300                             | 1,000                      |
| AUE1603                           | 16                  | 4,700  | 1,550                      | 1,750                             | 760                        |
| AUE2003                           | 20                  | 3,750  | 1,250                      | 1,400                             | 600                        |

|                                    |                    |       |  |       |      |
|------------------------------------|--------------------|-------|--|-------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑) |       |  |       |      |
|                                    | Ap=2.0D<br>Ae=0.5D |       |  |       |      |
|                                    | V線速度               | 235.5 | V線速度   | 87.92 |      |
|                                    | Z刃數                | 3     | Z刃數  | 3     |      |
|                                    |                    | Fz    | 0.11   | Fz    | 0.10 |

**AUE**

產品規格表 **P174**  
Specification page

**AUR**

產品規格表 **P176**  
Specification page

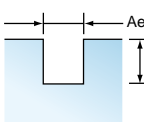
**S-AUE**

產品規格表 **P178**  
Specification page

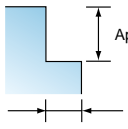
## • AUE,AUR,S-AUE Series 3 Flutes Slotting 溝銑切削

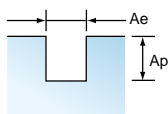
| Work Material<br>被削材              |                     | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金 |                            | Copper<br>銅                       |                            |
|-----------------------------------|---------------------|--|----------------------------|-----------------------------------|----------------------------|
| Max Cutting Speed(V)<br>最大切削速度(V) |                     | 250m/min   |                            | 90m/min                           |                            |
| TYPE NO.                          | Diameter<br>直徑 (mm) | Speed<br>迴轉數 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉數 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) |
| AUE0253                           | 2.5                 | 20,000   | 1,500                      | 11,800                            | 850                        |
| AUE0303                           | 3                   | 18,000   | 1,800                      | 9,840                             | 990                        |
| AUE0403                           | 4                   | 15,000   | 2,300                      | 7,440                             | 1,100                      |
| AUE0503                           | 5                   | 13,000   | 2,800                      | 5,920                             | 1,200                      |
| AUE0603                           | 6                   | 12,000   | 4,000                      | 4,960                             | 1,350                      |
| AUE0803                           | 8                   | 10,000   | 3,040                      | 3,680                             | 1,050                      |
| AUE1003                           | 10                  | 8,000  | 2,400                      | 2,960                             | 850                        |
| AUE1203                           | 12                  | 6,660  | 2,000                      | 2,480                             | 700                        |
| AUE1603                           | 16                  | 5,000  | 1,300                      | 1,840                             | 500                        |
| AUE2003                           | 20                  | 4,000  | 1,000                      | 1,520                             | 400                        |

|                                    |                    |       |  |        |      |
|------------------------------------|--------------------|-------|--|--------|------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)     |       |  |        |      |
|                                    | Ap=1.5D<br>Ae=1.0D |       |  |        |      |
|                                    | V線速度               | 251.2 | V線速度   | 92.944 |      |
|                                    | Z刃數                | 3     | Z刃數  | 3      |      |
|                                    |                    | Fz    | 0.10   | Fz     | 0.14 |

產品規格表 **P174**  
Specification page

| ● AUEL Series 3 Flutes Side Milling 側銑切削 |                        |  |                               |                                      |                               |
|--|------------------------|--|-------------------------------|--------------------------------------|-------------------------------|
| Work Material<br>被削材                     |                        | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金   |                               | Copper<br>銅                          |                               |
| Max Cutting Speed (V)<br>最大切削速度(V)       |                        | 240m/min   |                               | 87m/min                              |                               |
| TYPE NO.                                 | Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| AUEL0603                                 | 6                      | 6360   | 1259                          | 2330                                 | 419                           |
| AUEL0803                                 | 8                      | 4770   | 944                           | 1747                                 | 315                           |
| AUEL1003                                 | 10                     | 3816   | 756                           | 1398                                 | 252                           |
| AUEL1203                                 | 12                     | 3180   | 630                           | 1165                                 | 210                           |
| Depth of cut<br>切削基準量<br>(D=直徑Dia)       |                        | *Side milling (側銑)<br>$A_p=4.5D$<br>$A_e=0.05D$  |                               |                                      |                               |
|  |                        | V線速度   | 120                           | V線速度                                 | 43.96                         |
|  |                        | Z刀數  | 3                             | Z刀數                                  | 3                             |
|  |                        | Fz   | 0.066                         | Fz                                   | 0.06                          |

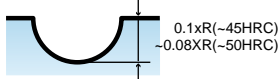
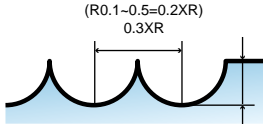
| ● AUEL Series 3 Flutes Slotting Milling 溝銑切削 |                        |   |                               |                                      |                               |
|--|------------------------|---|-------------------------------|--------------------------------------|-------------------------------|
| Work Material<br>被削材                         |                        | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Sil 13%<br>鋁合金  |                               | Copper<br>銅                          |                               |
| Max Cutting Speed (V)<br>最大切削速度(V)           |                        | 240m/min  |                               | 87m/min                              |                               |
| TYPE NO.                                     | Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| AUEL0603                                     | 6                      | 6657  | 1198                          | 2463                                 | 621                           |
| AUEL0803                                     | 8                      | 4993  | 899                           | 1847                                 | 466                           |
| AUEL1003                                     | 10                     | 3994  | 719                           | 1478                                 | 372                           |
| AUEL1203                                     | 12                     | 3328  | 599                           | 1232                                 | 310                           |
| Depth of cut<br>切削基準量<br>(D=直徑Dia)           |                        | *Slotting (溝銑)<br>$A_p=1.0D$<br>$A_e=1.0D$  |                               |                                      |                               |
|  |                        | V線速度  | 125.6                         | V線速度                                 | 46.472                        |
|  |                        | Z刀數   | 3                             | Z刀數                                  | 3                             |
|  |                        | Fz  | 0.060                         | Fz                                   | 0.084                         |

產品規格表 **P175**  
Specification page

## ● AUB Series 標準切削

| Work Material<br>被削材  | Aluminum<br>鋁                         |                               | Copper<br>銅                           |                               |
|-----------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 150m/min                              |                               | 150m/min                              |                               |
| Radius                | Speed<br>迴轉數<br>( $\text{min}^{-1}$ ) | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>迴轉數<br>( $\text{min}^{-1}$ ) | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.15R                | 40000                                 | 440                           | 40000                                 | 400                           |
| D0.2R                 | 40000                                 | 480                           | 40000                                 | 480                           |
| D0.25R                | 40000                                 | 540                           | 40000                                 | 540                           |
| D0.3R                 | 40000                                 | 600                           | 40000                                 | 600                           |
| D0.4R                 | 40000                                 | 800                           | 40000                                 | 800                           |
| D0.5R                 | 40000                                 | 1000                          | 40000                                 | 830                           |
| D0.75R                | 40000                                 | 1360                          | 30000                                 | 1160                          |
| D1R                   | 40000                                 | 2000                          | 24000                                 | 1200                          |
| D1.25R                | 38000                                 | 2400                          | 19000                                 | 1200                          |
| D1.5R                 | 32000                                 | 2400                          | 16000                                 | 1200                          |
| D1.75R                | 27300                                 | 2400                          | 13600                                 | 1200                          |
| D2R                   | 24000                                 | 2400                          | 12000                                 | 1200                          |
| D2.5R                 | 19000                                 | 2400                          | 9600                                  | 1200                          |
| D3R                   | 16000                                 | 2400                          | 8000                                  | 1200                          |
| D4R                   | 12000                                 | 2400                          | 6000                                  | 1200                          |
| D5R                   | 9600                                  | 2300                          | 4800                                  | 1150                          |
| D6R                   | 8000                                  | 2100                          | 4000                                  | 1050                          |
| D7R                   | 6800                                  | 2000                          | 3400                                  | 1000                          |
| D8R                   | 6000                                  | 2000                          | 3000                                  | 1000                          |
| D10R                  | 4800                                  | 2000                          | 2400                                  | 1000                          |
| D12.5R                | 3840                                  | 1900                          | 1920                                  | 940                           |

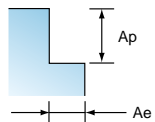
|                                   |   |  |
|-----------------------------------|---|--|
| Depth of cut<br>切削基準量<br>(R=球頭半徑) |  |              |
|                                   |   | -0.16XR R ≦ 0.3 (-45HRC)<br>-0.25XR R ≦ 3 (-45HRC)<br>-0.17XR R ≧ 4 (-45HRC)<br>-0.05XR (-50HRC) |

產品規格表 **P179**  
Specification page

## ● AAS,AA 3 Flutes Side Milling 側銑切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                          | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                          | Copper alloy C1100<br>銅              |                          |
|----------------------|---|--------------------------|--|--------------------------|--------------------------------------|--------------------------|
| Cutting Speed 切削速度   | 200m/min  |                          | 200m/min                                 |                          | 75m/min                              |                          |
| Type No.<br>型號       | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度              | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度     | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
| AA 0303              | 21000   | 950                      | 21000                                    | 950                      | 7950                                 | 320                      |
| AA 0403              | 15500   | 1080                     | 15500                                    | 1080                     | 5950                                 | 350                      |
| AA 0503              | 12500   | 1100                     | 12500                                    | 1100                     | 4750                                 | 380                      |
| AA 0603              | 10500   | 1200                     | 10500                                    | 1200                     | 3950                                 | 400                      |
| AA 0803              | 7950  | 1300                     | 7950                                     | 1300                     | 2950                                 | 450                      |
| AA 1003              | 6350  | 1500                     | 6350                                     | 1500                     | 2350                                 | 480                      |
| AA 1203              | 5300  | 1550                     | 5300                                     | 1550                     | 1950                                 | 510                      |
| AA 1603              | 3950  | 1550                     | 3950                                     | 1550                     | 1450                                 | 510                      |
| AA 2003              | 3150  | 1550                     | 3150                                     | 1550                     | 1150                                 | 510                      |

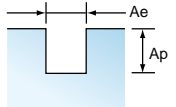
  

|                      |  |
|----------------------|--|
| Depth of cut<br>加工深度 | <p>*Side milling (側銑)</p>  <p>Ae=0.1D<br/>Ap=1.5D</p> |
|----------------------|--|

## ● AAS,AA 3 Flutes Slotting 溝銑切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                          | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                          | Copper alloy C1100<br>銅              |                          |
|----------------------|---|--------------------------|--|--------------------------|--------------------------------------|--------------------------|
| Cutting Speed 切削速度   | 200m/min  |                          | 200m/min                                 |                          | 75m/min                              |                          |
| Type No.<br>型號       | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度              | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度     | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
| AA 0303              | 21000   | 670                      | 21000                                    | 670                      | 7950                                 | 325                      |
| AA 0403              | 15500   | 700                      | 15500                                    | 700                      | 5950                                 | 365                      |
| AA 0503              | 12500   | 745                      | 12500                                    | 745                      | 4750                                 | 385                      |
| AA 0603              | 10500   | 820                      | 10500                                    | 820                      | 3950                                 | 405                      |
| AA 0803              | 7950  | 865                      | 7950                                     | 865                      | 2950                                 | 455                      |
| AA 1003              | 6350  | 970                      | 6350                                     | 970                      | 2350                                 | 475                      |
| AA 1203              | 5300  | 1030                     | 5300                                     | 1030                     | 1950                                 | 510                      |
| AA 1603              | 3950  | 1030                     | 3950                                     | 1030                     | 1450                                 | 510                      |
| AA 2003              | 3150  | 1030                     | 3150                                     | 1030                     | 1150                                 | 510                      |

|                      |   |
|----------------------|---|
| Depth of cut<br>加工深度 | <p>*Slotting (溝銑)</p>  <p>Ap=1.0D<br/>Ae=0.5D</p> |
|----------------------|---|

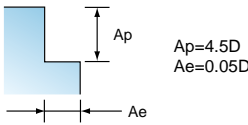
- Use a rigid and precise machine and holder.
- Use a water soluble cutting fluid.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.

產品規格表 **P180**  
Specification page

## • AAL Series 3 Flutes Side Milling 側銑切削

| Work Material<br>被削材               |                        | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si1 13%<br>鋁合金 |                               | Copper<br>銅                          |                               |
|------------------------------------|------------------------|--|-------------------------------|--------------------------------------|-------------------------------|
| Max Cutting Speed (V)<br>最大切削速度(V) |                        | 240m/min   |                               | 87m/min                              |                               |
| TYPE NO.                           | Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| AAL0206                            | 2                      | 15900  | 2385                          | 6360                                 | 859                           |
| AAL0309                            | 3                      | 10600  | 1590                          | 4240                                 | 572                           |
| AAL0412                            | 4                      | 7950   | 1193                          | 3180                                 | 429                           |
| AAL0515                            | 5                      | 6360   | 954                           | 2544                                 | 343                           |
| AAL0618                            | 6                      | 5300   | 795                           | 2120                                 | 286                           |
| AAL0824                            | 8                      | 3975   | 596                           | 1590                                 | 215                           |
| AAL1030                            | 10                     | 3180   | 477                           | 1272                                 | 172                           |
| AAL1236                            | 12                     | 2650   | 398                           | 1060                                 | 143                           |
| AAL2055                            | 16                     | 1988   | 298                           | 795                                  | 107                           |
| AAL1649                            | 20                     | 1590   | 239                           | 636                                  | 86                            |

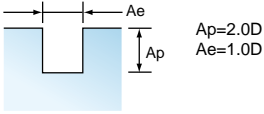
  

|                                    |   |      |      |       |
|------------------------------------|---|------|------|-------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑)  |      |      |       |
|                                    | V線速度  | 100  | V線速度 | 40    |
|                                    | Z刃數   | 3    | Z刃數  | 3     |
|                                    | Fz  | 0.05 | Fz   | 0.045 |

## • AAL Series 3 Flutes Slotting Milling 溝銑切削

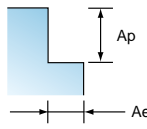
| Work Material<br>被削材               |                        | Aluminum alloy expanding material A7075<br>Aluminum alloy casting<Si1 13%<br>鋁合金 |                               | Copper<br>銅                          |                               |
|------------------------------------|------------------------|--|-------------------------------|--------------------------------------|-------------------------------|
| Max Cutting Speed (V)<br>最大切削速度(V) |                        | 240m/min   |                               | 87m/min                              |                               |
| TYPE NO.                           | Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| AAL0206                            | 2                      | 15900  | 1670                          | 7155                                 | 923                           |
| AAL0309                            | 3                      | 10600  | 1113                          | 4770                                 | 615                           |
| AAL0412                            | 4                      | 7950   | 835                           | 3578                                 | 461                           |
| AAL0515                            | 5                      | 6360   | 668                           | 2862                                 | 369                           |
| AAL0618                            | 6                      | 5300   | 557                           | 2385                                 | 308                           |
| AAL0824                            | 8                      | 3975   | 417                           | 1789                                 | 231                           |
| AAL1030                            | 10                     | 3180   | 334                           | 1431                                 | 185                           |
| AAL1236                            | 12                     | 2650   | 278                           | 1193                                 | 154                           |
| AAL2055                            | 16                     | 1988   | 209                           | 894                                  | 115                           |
| AAL1649                            | 20                     | 1590   | 167                           | 716                                  | 92                            |

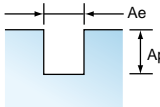
|                                    |   |       |      |       |
|------------------------------------|---|-------|------|-------|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)  |       |      |       |
|                                    | V線速度  | 100   | V線速度 | 45    |
|                                    | Z刃數   | 3     | Z刃數  | 3     |
|                                    | Fz  | 0.035 | Fz   | 0.043 |

產品規格表 **P181**  
Specification page

## • CMF Series Side Milling 側銑切削

| Work Material<br>被削材               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting< Sil 13%<br>鋁合金   |                               | Copper<br>銅                          |                               |
|------------------------------------|---|-------------------------------|--------------------------------------|-------------------------------|
| Diameter<br>直徑<br>(mm)             | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| 2.5                                | 30000   | 1733                          | 11000                                | 533                           |
| 3                                  | 25000   | 1933                          | 9250                                 | 667                           |
| 4                                  | 18750   | 2200                          | 6950                                 | 867                           |
| 5                                  | 15000   | 2467                          | 5550                                 | 1067                          |
| 6                                  | 12500   | 2767                          | 4650                                 | 1333                          |
| 8                                  | 9400  | 2100                          | 3500                                 | 1013                          |
| 10                                 | 7500  | 1667                          | 2800                                 | 800                           |
| 12                                 | 6250  | 1400                          | 2300                                 | 667                           |
| 16                                 | 4700  | 1033                          | 1750                                 | 507                           |
| 20                                 | 3750  | 833                           | 1400                                 | 400                           |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Side milling (側銑)  Ap=2.0D<br>Ae=0.05D |                               |                                      |                               |
| Vc 線速度                             | 235.5   |                               | 87.92                                |                               |
| Z 刃數                               | 3   |                               | 3                                    |                               |
| Fz                                 | 0.11  |                               | 0.1                                  |                               |

## • CMF Series Slotting 溝銑切削

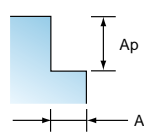
| Work Material<br>被削材               | Aluminum alloy expanding material A7075<br>Aluminum alloy casting< Sil 13%<br>鋁合金                                    |                               | Copper<br>銅                          |                               |
|------------------------------------|--|-------------------------------|--------------------------------------|-------------------------------|
| Diameter<br>直徑<br>(mm)             | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| 2.5                                | 20000  | 1000                          | 118000                               | 567                           |
| 3                                  | 18000  | 1200                          | 9840                                 | 660                           |
| 4                                  | 15000  | 1533                          | 7440                                 | 733                           |
| 5                                  | 13000  | 1867                          | 5920                                 | 800                           |
| 6                                  | 12000  | 2667                          | 4960                                 | 900                           |
| 8                                  | 10000  | 2027                          | 3680                                 | 700                           |
| 10                                 | 8000   | 14933                         | 2960                                 | 567                           |
| 12                                 | 6660   | 1333                          | 2480                                 | 467                           |
| 16                                 | 5000   | 867                           | 1840                                 | 333                           |
| 20                                 | 4000   | 667                           | 1520                                 | 267                           |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | *Slotting (溝銑)  Ap=1.5D<br>Ae=1D |                               |                                      |                               |
| Vc 線速度                             | 251.2  |                               | 92.944                               |                               |
| Z 刃數                               | 3  |                               | 3                                    |                               |
| Fz                                 | 0.1  |                               | 0.14                                 |                               |

產品規格表 **P182**  
Specification page

## • CA-AA 3 Flutes Side Milling 側銑切削

| Work Material<br>被削材   | Aluminum alloy expanding material A7075 |                               | Aluminum alloy casting<Sil 13%<br>鋁合金 |                               | Copper<br>銅                          |                               |
|------------------------|---|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )    | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| CA-AA03                | 21000                                   | 950                           | 21000                                 | 950                           | 7950                                 | 320                           |
| CA-AA04                | 15500                                   | 1080                          | 15500                                 | 1080                          | 5950                                 | 350                           |
| CA-AA06                | 10500                                   | 1200                          | 10500                                 | 1200                          | 3950                                 | 400                           |
| CA-AA08                | 7950                                    | 1300                          | 7950                                  | 1300                          | 2950                                 | 450                           |
| CA-AA10                | 6350                                    | 1500                          | 6350                                  | 1500                          | 2350                                 | 480                           |
| CA-AA12                | 5300                                    | 1550                          | 5300                                  | 1550                          | 1950                                 | 510                           |
| CA-AA16                | 3950                                    | 1550                          | 3950                                  | 1550                          | 1450                                 | 510                           |
| CA-AA20                | 3150                                    | 1550                          | 3150                                  | 1550                          | 1150                                 | 510                           |

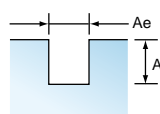
  

|                                    |  |
|------------------------------------|--|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Side milling (側銑)</p>  <p>Ap=1.5D<br/>Ae=0.1D</p> |
|------------------------------------|--|

## • CA-AA 3 Flutes Slotting Milling 溝銑切削

| Work Material<br>被削材   | Aluminum alloy expanding material A7075 |                               | Aluminum alloy casting<Sil 13%<br>鋁合金 |                               | Copper<br>銅                          |                               |
|------------------------|---|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )    | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |
| CA-AA03                | 21000                                   | 670                           | 21000                                 | 670                           | 7950                                 | 325                           |
| CA-AA04                | 15500                                   | 700                           | 15500                                 | 700                           | 5950                                 | 365                           |
| CA-AA06                | 10500                                   | 820                           | 10500                                 | 820                           | 3950                                 | 405                           |
| CA-AA08                | 7950                                    | 865                           | 7950                                  | 865                           | 2950                                 | 455                           |
| CA-AA10                | 6350                                    | 970                           | 6350                                  | 970                           | 2350                                 | 475                           |
| CA-AA12                | 5300                                    | 1030                          | 5300                                  | 1030                          | 1950                                 | 510                           |
| CA-AA16                | 3950                                    | 1030                          | 3950                                  | 1030                          | 1450                                 | 510                           |
| CA-AA20                | 3150                                    | 1030                          | 3150                                  | 1030                          | 1150                                 | 500                           |

|                                    |  |
|------------------------------------|--|
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Slotting (溝銑)</p>  <p>Ap=1.5D<br/>Ae=1.0D</p> |
|------------------------------------|--|



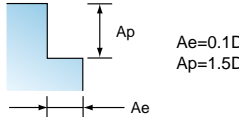
產品規格表 **P183-184**  
Specification page

## ● CR-AA 3 Flutes Side Milling 側銑切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                          | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                          | Copper alloy C1100<br>銅              |                          |
|----------------------|---|--------------------------|--|--------------------------|--------------------------------------|--------------------------|
| Type No.<br>型號       | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度              | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度     | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
| CRAA 03--            | 21000   | 950                      | 21000                                    | 950                      | 7950                                 | 320                      |
| CRAA 04--            | 15500   | 1080                     | 15500                                    | 1080                     | 5950                                 | 350                      |
| CRAA 06--            | 10500   | 1200                     | 10500                                    | 1200                     | 3950                                 | 400                      |
| CRAA 08--            | 7950  | 1300                     | 7950                                     | 1300                     | 2950                                 | 450                      |
| CRAA 10--            | 6350  | 1500                     | 6350                                     | 1500                     | 2350                                 | 480                      |
| CRAA 12--            | 5300  | 1550                     | 5300                                     | 1550                     | 1950                                 | 510                      |
| CRAA 16--            | 3950  | 1550                     | 3950                                     | 1550                     | 1450                                 | 510                      |
| CRAA 20--            | 3150  | 1550                     | 3150                                     | 1550                     | 1150                                 | 510                      |

Depth of cut  
加工深度

\*Side milling (側銑)



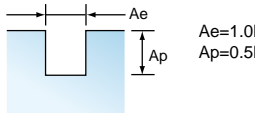
Ae=0.1D  
Ap=1.5D

## ● CR-AA 3 Flutes Slotting 溝銑切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                          | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                          | Copper alloy C1100<br>銅              |                          |
|----------------------|---|--------------------------|--|--------------------------|--------------------------------------|--------------------------|
| Type No.<br>型號       | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度              | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度     | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
| CRAA 03--            | 21000   | 670                      | 21000                                    | 670                      | 7950                                 | 325                      |
| CRAA 04--            | 15500   | 700                      | 15500                                    | 700                      | 5950                                 | 365                      |
| CRAA 06--            | 10500   | 820                      | 10500                                    | 820                      | 3950                                 | 405                      |
| CRAA 08--            | 7950  | 865                      | 7950                                     | 865                      | 2950                                 | 455                      |
| CRAA 10--            | 6350  | 970                      | 6350                                     | 970                      | 2350                                 | 475                      |
| CRAA 12--            | 5300  | 1030                     | 5300                                     | 1030                     | 1950                                 | 510                      |
| CRAA 16--            | 3950  | 1030                     | 3950                                     | 1030                     | 1450                                 | 510                      |
| CRAA 20--            | 3150  | 1030                     | 3150                                     | 1030                     | 1150                                 | 500                      |

Depth of cut  
加工深度

\*Slotting (溝銑)



Ae=1.0D  
Ap=0.5D

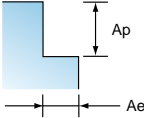
- Use a rigid and precise machine and holder.
- Use a Water soluble cutting fluid.
- Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.

產品規格表 **P183-184**  
Specification page

## ● CR-AA 3 Flutes High Speed Side Milling 高速側銑切削

| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                                      | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                                      | Copper alloy C1100<br>銅  |                                      |                          |
|----------------------|---|--------------------------------------|--|--------------------------------------|--------------------------|--------------------------------------|--------------------------|
|                      | Type No.<br>型號                                    | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度                 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
|                      | CRAA 03--   | 40000                                | 2080                                     | 24000                                | 1260                     | 17000                                | 625                      |
|                      | CRAA 04--   | 32000                                | 2550                                     | 19200                                | 1550                     | 14300                                | 800                      |
|                      | CRAA 06--   | 26500                                | 3500                                     | 15900                                | 2150                     | 10600                                | 959                      |
|                      | CRAA 08--   | 20000                                | 3750                                     | 12000                                | 2250                     | 8000                                 | 1130                     |
|                      | CRAA 10--   | 16000                                | 4300                                     | 9600                                 | 2580                     | 6350                                 | 1150                     |
|                      | CRAA 12--   | 13300                                | 4400                                     | 7980                                 | 2650                     | 5300                                 | 1250                     |
|                      | CRAA 16--   | 10000                                | 4400                                     | 6000                                 | 2650                     | 4000                                 | 1250                     |
|                      | CRAA 20--   | 8000                                 | 4400                                     | 4800                                 | 2650                     | 3200                                 | 1250                     |

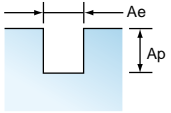
  

|                      |                    |  |  |  |                  |  |
|----------------------|--------------------|--|--|--|------------------|--|
| Depth of cut<br>加工深度 | *Side milling (側銑) |  |  |  | Ae=0.1D<br>Ap=1D |  |
|----------------------|--------------------|--|--|--|------------------|--|

## ● CR-AA 3 Flutes High Speed Slotting 高速溝銑切削


| Work Material<br>被削材 | Aluminum alloy<br>expanding material A7075<br>鋁合金 |                                      | Aluminum alloy<br>casting<Sil 13%<br>鋁合金 |                                      |                          |
|----------------------|---|--------------------------------------|--|--------------------------------------|--------------------------|
|                      | Type No.<br>型號                                    | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度                 | Speed<br>(mm <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |
|                      | CRAA 03--   | 40000                                | 1450                                     | 24000                                | 800                      |
|                      | CRAA 04--   | 32000                                | 1680                                     | 19200                                | 1000                     |
|                      | CRAA 06--   | 26500                                | 2400                                     | 15900                                | 1450                     |
|                      | CRAA 08--   | 20000                                | 2500                                     | 12000                                | 1500                     |
|                      | CRAA 10--   | 16000                                | 2800                                     | 9600                                 | 1700                     |
|                      | CRAA 12--   | 13300                                | 2950                                     | 7980                                 | 1780                     |
|                      | CRAA 16--   | 10000                                | 3000                                     | 6000                                 | 1800                     |
|                      | CRAA 20--   | 8000                                 | 3000                                     | 4800                                 | 1800                     |


  


|                      |                |  |  |  |                     |  |
|----------------------|----------------|--|--|--|---------------------|--|
| Depth of cut<br>加工深度 | *Slotting (溝銑) |  |  |  | Ae=1.0D<br>Ap=0.25D |  |
|----------------------|----------------|--|--|--|---------------------|--|


產品規格表 **P188**  
Specification page

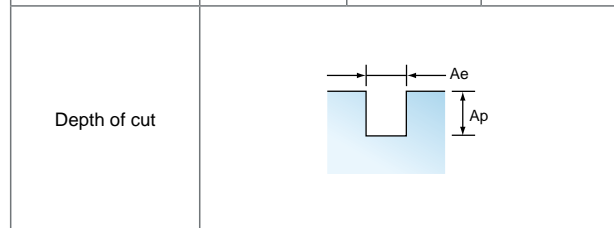
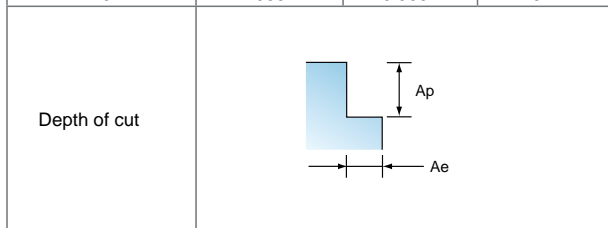
## PVE1T/PLVE1T Cutting Condition

| Type              |   | PVE1T   |               |  |
|-------------------|---|---|---------------|--|
| Side Milling      |  | TITANIUM ALLOYS(DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |               |  |
| Hardness BRINELL  |   | ≤ 300   |               |  |
| HRC               |   | ≤ 31  |               |  |
| Vc                |   | 60  |               |  |
| Ae/AP             |   | Ae=0.4D<br>Ap=1.5D  |               |  |
| MILL DIA (Metric) | RPM   | Fz  | Feed 4 Flutes |  |
| 4                 | 4,775   | 0.0159  | 303.2         |  |
| 5                 | 3,820   | 0.0238  | 363.7         |  |
| 6                 | 3,183   | 0.0318  | 404.3         |  |
| 8                 | 2,388   | 0.0397  | 378.7         |  |
| 10                | 1,910   | 0.0429  | 327.5         |  |
| 12                | 1,592   | 0.0582  | 370.6         |  |
| 16                | 1,194   | 0.0642  | 306.5         |  |
| 20                | 955   | 0.0762  | 291.1         |  |

| Type              |   | PVE1T  |               |  |
|-------------------|---|--|---------------|--|
| Slot Milling      |  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |               |  |
| Hardness BRINELL  |   | ≤ 300  |               |  |
| HRC               |   | ≤ 31   |               |  |
| Vc                |   | 50   |               |  |
| Ae/AP             |   | Ae=1D<br>Ap=1.25D  |               |  |
| MILL DIA (Metric) | RPM   | Fz   | Feed 4 Flutes |  |
| 4                 | 3,980   | 0.0119   | 189.5         |  |
| 5                 | 3,184   | 0.0190   | 242.5         |  |
| 6                 | 2,653   | 0.0265   | 280.8         |  |
| 8                 | 1,990   | 0.0297   | 236.7         |  |
| 10                | 1,592   | 0.0333   | 212.3         |  |
| 12                | 1,327   | 0.0423   | 224.6         |  |
| 16                | 995   | 0.0494   | 196.5         |  |
| 20                | 796   | 0.0572   | 182.0         |  |

| Type              |  | PLVE1T   |               |  |
|-------------------|--|--|---------------|--|
| Side Milling      |  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |               |  |
| Hardness BRINELL  |  | ≤ 300  |               |  |
| HRC               |  | ≤ 31   |               |  |
| Vc                |  | 60   |               |  |
| Ae/AP             |  | Ae=0.2D<br>Ap=1.8D   |               |  |
| MILL DIA (Metric) | RPM  | Fz   | Feed 4 Flutes |  |
| 4                 | 4775   | 0.0119   | 227.4         |  |
| 5                 | 3820   | 0.0238   | 363.7         |  |
| 6                 | 3183   | 0.0265   | 336.9         |  |
| 8                 | 2388   | 0.0297   | 284.0         |  |
| 10                | 1910   | 0.0381   | 291.1         |  |
| 12                | 1592   | 0.0476   | 303.2         |  |
| 16                | 1194   | 0.0593   | 282.9         |  |
| 20                | 955  | 0.0667   | 254.7         |  |

| Type              |  | PLVE1T   |               |  |
|-------------------|--|--|---------------|--|
| Slot Milling      |  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |               |  |
| Hardness BRINELL  |  | ≤ 300  |               |  |
| HRC               |  | ≤ 31   |               |  |
| Vc                |  | 50   |               |  |
| Ae/AP             |  | Ae=1D<br>Ap=1.5D   |               |  |
| MILL DIA (Metric) | RPM  | Fz   | Feed 4 Flutes |  |
| 4                 | 3980   | 0.0079   | 126.4         |  |
| 5                 | 3184   | 0.0143   | 181.9         |  |
| 6                 | 2653   | 0.0212   | 224.6         |  |
| 8                 | 1990   | 0.0248   | 197.3         |  |
| 10                | 1592   | 0.0286   | 182.0         |  |
| 12                | 1327   | 0.0370   | 196.6         |  |
| 16                | 995  | 0.0444   | 176.9         |  |
| 20                | 796  | 0.0524   | 166.8         |  |




**PNVE1T/PVE1TF**


產品規格表 **P189-190**  
Specification page


**PVR1T**


產品規格表 **P191**  
Specification page

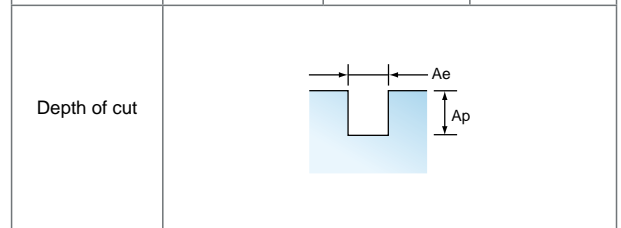
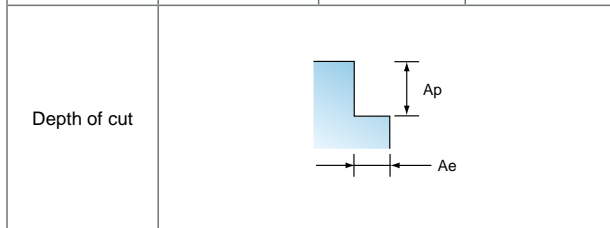
## PNVE1T/PVE1TF/PVR1T Cutting Condition

| Type   |  | PNVE1T, PVE1TF |               |                    |        |               |  |
|--|--|----------------|---------------|--------------------|--------|---------------|--|
| Side Milling  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |                |               |                    |        |               |  |
|  | Hardness BRINELL   | ≤ 300          |               |                    |        |               |  |
| HRC  | ≤ 31   |                |               |                    |        |               |  |
| Vc   | 60   |                |               | 50                 |        |               |  |
| Ae/Ap  | Ae=0.65D<br>Ap=1D  |                |               | Ae=0.4D<br>Ap=1.5D |        |               |  |
| MILL DIA (Metric)  | RPM  | Fz             | Feed 4 Flutes | RPM                | Fz     | Feed 4 Flutes |  |
| 4  | 4,775  | 0.0119         | 227.4         | 3,980              | 0.0119 | 189.5         |  |
| 5  | 3,820  | 0.0238         | 363.7         | 3,184              | 0.0190 | 242.5         |  |
| 6  | 3,183  | 0.0318         | 404.3         | 2,653              | 0.0212 | 224.6         |  |
| 8  | 2,388  | 0.0397         | 378.7         | 1,990              | 0.0248 | 197.3         |  |
| 10   | 1,910  | 0.0429         | 327.5         | 1,592              | 0.0333 | 212.3         |  |
| 12   | 1,592  | 0.0635         | 404.3         | 1,327              | 0.0423 | 224.6         |  |
| 16   | 1,194  | 0.0642         | 306.5         | 995                | 0.0494 | 196.5         |  |
| 20   | 955  | 0.0714         | 272.9         | 796                | 0.0572 | 182.0         |  |

| Type   |  | PNVE1T, PVE1TF |               |                   |        |               |  |
|--|--|----------------|---------------|-------------------|--------|---------------|--|
| Slot Milling  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |                |               |                   |        |               |  |
|  | Hardness BRINELL   | ≤ 300          |               |                   |        |               |  |
| HRC  | ≤ 31   |                |               |                   |        |               |  |
| Vc   | 50   |                |               | 40                |        |               |  |
| Ae/Ap  | Ae=1D<br>Ap=0.9D   |                |               | Ae=1D<br>Ap=1.25D |        |               |  |
| MILL DIA (Metric)  | RPM  | Fz             | Feed 4 Flutes | RPM               | Fz     | Feed 4 Flutes |  |
| 4  | 3,980  | 0.0119         | 189.5         | 3,185             | 0.0079 | 101.1         |  |
| 5  | 3,184  | 0.0190         | 242.5         | 2,548             | 0.0143 | 145.5         |  |
| 6  | 2,653  | 0.0265         | 280.8         | 2,123             | 0.0212 | 179.8         |  |
| 8  | 1,990  | 0.0347         | 276.2         | 1,593             | 0.0248 | 157.9         |  |
| 10   | 1,592  | 0.0429         | 272.9         | 1,274             | 0.0286 | 145.6         |  |
| 12   | 1,327  | 0.0529         | 280.8         | 1,062             | 0.0423 | 179.8         |  |
| 16   | 995  | 0.0593         | 235.8         | 796               | 0.0444 | 141.5         |  |
| 20   | 796  | 0.0667         | 212.3         | 637               | 0.0524 | 133.5         |  |

| Type  |  | PVR1T  |               |  |  |
|---|--|--------|---------------|--|--|
| Side Milling  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |        |               |  |  |
|   | Hardness BRINELL   | ≤ 300  |               |  |  |
| HRC   | ≤ 31   |        |               |  |  |
| Vc  | 18   |        |               |  |  |
| Ae/Ap   | Ae=0.4D<br>Ap=1.5D   |        |               |  |  |
| MILL DIA (Metric)   | RPM  | Fz     | Feed 4 Flutes |  |  |
| 4   | 3,980  | 0.0119 | 189.5         |  |  |
| 5   | 3,184  | 0.0190 | 242.5         |  |  |
| 6   | 2,653  | 0.0212 | 224.6         |  |  |
| 8   | 1,990  | 0.0248 | 197.3         |  |  |
| 10  | 1,592  | 0.0333 | 212.3         |  |  |
| 12  | 1,327  | 0.0423 | 224.6         |  |  |
| 16  | 995  | 0.0494 | 196.5         |  |  |
| 20  | 796  | 0.0572 | 182.0         |  |  |

| Type  |  | PVR1T  |               |  |  |
|---|--|--------|---------------|--|--|
| Slot Milling  | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |        |               |  |  |
|   | Hardness BRINELL   | ≤ 300  |               |  |  |
| HRC   | ≤ 31   |        |               |  |  |
| Vc  | 18   |        |               |  |  |
| Ae/Ap   | Ae=1D<br>Ap=1.25D  |        |               |  |  |
| MILL DIA (Metric)   | RPM  | Fz     | Feed 4 Flutes |  |  |
| 4   | 3,185  | 0.0079 | 101.1         |  |  |
| 5   | 2,548  | 0.0143 | 145.5         |  |  |
| 6   | 2,123  | 0.0212 | 179.8         |  |  |
| 8   | 1,593  | 0.0248 | 157.9         |  |  |
| 10  | 1,274  | 0.0286 | 145.6         |  |  |
| 12  | 1,062  | 0.0423 | 179.8         |  |  |
| 16  | 796  | 0.0444 | 141.5         |  |  |
| 20  | 637  | 0.0524 | 133.5         |  |  |

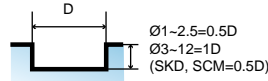
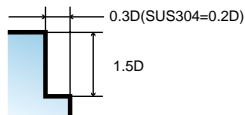


產品規格表 P196-197  
Specification page

## ● SUPE 3 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels S50C<br>碳素鋼            |                            |                    | Alloy Tool Steels, SCM, SKD<br>合金工具鋼 |                                      |                            | Stainless Steels, Titanium Alloys<br>SUS304, SUS316等<br>不鏽鋼, 鈦合金 |                |                                      | Prehardened Steels, HPM, NAK<br>調質鋼-HRC40 |                    |                |                                      |                            |                    |                |
|-----------------------|--------------------------------------|----------------------------|--------------------|--------------------------------------|--------------------------------------|----------------------------|--|----------------|--------------------------------------|---|--------------------|----------------|--------------------------------------|----------------------------|--------------------|----------------|
| Cutting Speed<br>切削速度 | ~100m/min                            |                            |                    | ~50m/min                             |                                      |                            | ~35m/min   |                |                                      | ~56m/min                                  |                    |                |                                      |                            |                    |                |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |                    |                                      | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |  |                | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度                |                    |                | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |                    |                |
|                       |                                      | Side<br>Milling<br>側面      | Slotting<br>溝<br>溝 | Drilling<br>縱向                       |                                      | Side<br>Milling<br>側面      | Slotting<br>溝<br>溝   | Drilling<br>縱向 |                                      | Side<br>Milling<br>側面                     | Slotting<br>溝<br>溝 | Drilling<br>縱向 |                                      | Side<br>Milling<br>側面      | Slotting<br>溝<br>溝 | Drilling<br>縱向 |
| 1                     | 15,000                               | 400                        | 200                | 70                                   | 15,000                               | 210                        | 100  | 40             | 10,000                               | 200                                       | 70                 | -              | 15,000                               | 200                        | 100                | 50             |
| 1.5                   | 13,000                               | 500                        | 250                | 70                                   | 13,000                               | 270                        | 120  | 40             | 7,000                                | 250                                       | 70                 | -              | 13,000                               | 250                        | 130                | 50             |
| 2                     | 11,000                               | 600                        | 300                | 100                                  | 8,000                                | 350                        | 140  | 50             | 5,000                                | 250                                       | 70                 | -              | 10,000                               | 300                        | 150                | 70             |
| 2.5                   | 10,000                               | 700                        | 400                | 100                                  | 7,000                                | 450                        | 160  | 60             | 4,000                                | 250                                       | 70                 | -              | 8,000                                | 350                        | 170                | 90             |
| 3                     | 9,600                                | 800                        | 550                | 200                                  | 4,200                                | 550                        | 200  | 100            | 3,600                                | 250                                       | 100                | -              | 5,800                                | 400                        | 250                | 100            |
| 4                     | 7,200                                | 900                        | 650                | 210                                  | 3,200                                | 500                        | 250  | 120            | 2,800                                | 250                                       | 100                | -              | 4,400                                | 400                        | 250                | 110            |
| 5                     | 5,700                                | 1,000                      | 700                | 260                                  | 2,500                                | 450                        | 250  | 120            | 2,200                                | 300                                       | 120                | -              | 3,500                                | 500                        | 300                | 120            |
| 6                     | 4,800                                | 1,200                      | 720                | 300                                  | 2,000                                | 400                        | 300  | 150            | 1,800                                | 300                                       | 120                | -              | 3,000                                | 600                        | 330                | 130            |
| 8                     | 3,600                                | 1,000                      | 760                | 300                                  | 1,600                                | 400                        | 300  | 120            | 1,400                                | 300                                       | 120                | -              | 2,200                                | 600                        | 330                | 100            |
| 10                    | 3,000                                | 900                        | 800                | 300                                  | 1,300                                | 350                        | 200  | 100            | 1,100                                | 300                                       | 100                | -              | 1,700                                | 400                        | 200                | 80             |
| 12                    | 2,600                                | 850                        | 740                | 280                                  | 1,100                                | 340                        | 180  | 80             | 900                                  | 270                                       | 100                | -              | 1,500                                | 340                        | 180                | 70             |

Depth of cut  
(D:直徑Dia)  
切削量基準



1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Air blow is recommended.
4. Non-water cutting fluid is recommended for cutting stainless steels.

1. 請使用剛性及精準度較佳之機械及夾頭。
2. 當切削量過大或機械剛性不足時，請降低迴轉速及進給速度。
3. 請使用吹氣方式進行切削。
4. 切削不鏽鋼時，請使用非水溶性切削油。

產品規格表 **P199**  
Specification page

### ● SULPE 4 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼, 合金鋼 ~HRC30 |                               |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened Steels, AISI H13<br>合金鋼, 工具鋼 |                               |               | Austenitic stainless Steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                               |               | Hardened Steels<br>SKD61, SKD11, NAK,<br>STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                               |               | Non is essential please<br>don't attempt<br>Hardened Steels<br>SKD11等<br>AISI D2<br>[非必要請勿嘗試]<br>熱處理鋼(50~60HRC) |                               |               |
|-----------------------|---|-------------------------------|---------------|---|-------------------------------|---------------|---|-------------------------------|---------------|--|-------------------------------|---------------|---|-------------------------------|---------------|
| Cutting Speed<br>切削速度 | 35~50m/min  |                               |               | 30~40m/min  |                               |               | 20~30m/min  |                               |               | 15~25m/min   |                               |               | 15~20m/min  |                               |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 |               |
|                       |   | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝 |   | Side<br>Milling<br>側面         | Slotting<br>溝 |
| 1                     | 11,000  | 85                            | 40            | 9,500   | 65                            | 30            | 8,000   | 50                            |               | 6,400  | 35                            | 17            | 4,800   | 20                            | 10            |
|                       |   |                               |               |   |                               |               | 6,400   |                               | 20            |  |                               |               |   |                               |               |
| 1.5                   | 7,400   | 85                            | 40            | 6,400   | 90                            | 45            | 5,300   | 50                            |               | 4,200  | 35                            | 17            | 3,200   | 20                            | 10            |
|                       |   |                               |               |   |                               |               | 4,240   |                               | 20            |  |                               |               |   |                               |               |
| 2                     | 5,600   | 85                            | 40            | 4,800   | 90                            | 45            | 4,000   | 50                            |               | 3,200  | 35                            | 17            | 2,400   | 20                            | 10            |
|                       |   |                               |               |   |                               |               | 3,200   |                               | 20            |  |                               |               |   |                               |               |
| 2.5                   | 4,500   | 85                            | 40            | 3,800   | 90                            | 45            | 3,200   | 55                            |               | 2,500  | 35                            | 17            | 2,100   | 20                            | 10            |
|                       |   |                               |               |   |                               |               | 2,560   |                               | 22            |  |                               |               |   |                               |               |
| 3                     | 4,200   | 100                           | 50            | 3,400   | 90                            | 45            | 2,600   | 60                            |               | 2,100  | 35                            | 17            | 1,800   | 25                            | 12            |
|                       |   |                               |               |   |                               |               | 2,080   |                               | 24            |  |                               |               |   |                               |               |
| 4                     | 3,400   | 125                           | 60            | 2,700   | 90                            | 45            | 2,100   | 70                            |               | 1,700  | 50                            | 25            | 1,400   | 30                            | 15            |
|                       |   |                               |               |   |                               |               | 1,680   |                               | 28            |  |                               |               |   |                               |               |
| 5                     | 2,900   | 155                           | 75            | 2,300   | 110                           | 55            | 1,800   | 85                            |               | 1,500  | 55                            | 27            | 1,200   | 35                            | 17            |
|                       |   |                               |               |   |                               |               | 1,440   |                               | 34            |  |                               |               |   |                               |               |
| 6                     | 2,500   | 180                           | 90            | 2,000   | 140                           | 70            | 1,500   | 110                           |               | 1,300  | 70                            | 35            | 1,000   | 40                            | 20            |
|                       |   |                               |               |   |                               |               | 1,200   |                               | 44            |  |                               |               |   |                               |               |
| 8                     | 1,900   | 200                           | 100           | 1,500   | 140                           | 70            | 1,200   | 110                           |               | 1,000  | 70                            | 35            | 800   | 40                            | 20            |
|                       |   |                               |               |   |                               |               | 960   |                               | 44            |  |                               |               |   |                               |               |
| 10                    | 1,600   | 205                           | 100           | 1,300   | 140                           | 70            | 950   | 110                           |               | 800  | 70                            | 35            | 650   | 40                            | 20            |
|                       |   |                               |               |   |                               |               | 760   |                               | 44            |  |                               |               |   |                               |               |
| 12                    | 1,300   | 180                           | 90            | 1,100   | 140                           | 70            | 800   | 110                           |               | 670  | 70                            | 35            | 530   | 40                            | 20            |
|                       |   |                               |               |   |                               |               | 640   |                               | 44            |  |                               |               |   |                               |               |
| 16                    | 1,000   | 120                           | 60            | 820   | 100                           | 50            | 600   | 80                            |               | 500  | 50                            | 25            | 400   | 30                            | 15            |
|                       |   |                               |               |   |                               |               | 480   |                               | 32            |  |                               |               |   |                               |               |
| 20                    | 800   | 95                            | 45            | 650   | 75                            | 35            | 480   | 70                            |               | 400  | 40                            | 20            | 320   | 25                            | 12            |
|                       |   |                               |               |   |                               |               | 384   |                               | 28            |  |                               |               |   |                               |               |
| 25                    | 650   | 75                            | 35            | 520   | 60                            | 30            | 380   | 50                            |               | 320  | 35                            | 17            | 250   | 20                            | 10            |
|                       |   |                               |               |   |                               |               | 280   |                               | 20            |  |                               |               |   |                               |               |

Depth of cut  
(D:直徑Dia)  
切削量基準

- In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
- If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- When drilling, please set the feed rate at 1/3 or below of the above value.

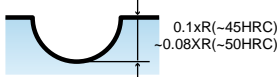
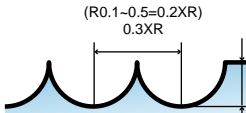
- 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
- 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
- 縱向進給時，進給速度請設定為上表之 1/3 以下。

產品規格表 **P210**  
Specification page

### ● SUBT 4 Flutes Standard Cutting Conditons 標準切削

| WORK MATERIAL<br>被切削材 | Carbon Steels S50C<br>碳素鋼            |                               | Alloy Steels<br>Prehardened Steels<br>SCM SKD HPM NAK<br>合金鋼、調質鋼 |                               | Hardened Steels<br>SKD61~HRC50<br>調質鋼 |                               | Aluminum<br>鋁                        |                               | Copper<br>銅                          |                               |
|-----------------------|--------------------------------------|-------------------------------|--|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 150m/min                             |                               | 120~150m/min   |                               | 80~100m/min                           |                               | 150~m/min                            |                               | 100~150m/min                         |                               |
| R                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                             | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.15R                | 40,000                               | 800                           | 40,000   | 720                           | 40,000                                | 660                           | 40,000                               | 880                           | 40,000                               | 800                           |
| D0.2R                 | 40,000                               | 1,000                         | 40,000   | 960                           | 40,000                                | 1,000                         | 40,000                               | 960                           | 40,000                               | 960                           |
| D0.25R                | 40,000                               | 1,240                         | 40,000   | 1,220                         | 40,000                                | 1,240                         | 40,000                               | 1,080                         | 40,000                               | 1,080                         |
| D0.3R                 | 40,000                               | 1,500                         | 40,000   | 1,500                         | 40,000                                | 1,500                         | 40,000                               | 1,200                         | 40,000                               | 1,200                         |
| D0.4R                 | 40,000                               | 1,920                         | 40,000   | 2,000                         | 36,000                                | 1,800                         | 40,000                               | 1,600                         | 40,000                               | 1,600                         |
| D0.5R                 | 40,000                               | 2,400                         | 38,000   | 2,400                         | 29,000                                | 1,800                         | 40,000                               | 2,000                         | 40,000                               | 1,660                         |
| D0.75R                | 30,000                               | 2,540                         | 25,500   | 2,200                         | 19,000                                | 1,400                         | 40,000                               | 2,720                         | 30,000                               | 2,320                         |
| D1R                   | 24,000                               | 2,320                         | 19,000   | 1,600                         | 14,300                                | 1,200                         | 40,000                               | 4,000                         | 24,000                               | 2,400                         |
| D1.25R                | 19,000                               | 2,000                         | 15,300   | 1,340                         | 11,500                                | 1,020                         | 38,000                               | 4,800                         | 19,000                               | 2,400                         |
| D1.5R                 | 16,000                               | 1,860                         | 13,000   | 1,200                         | 9,600                                 | 920                           | 32,000                               | 4,800                         | 16,000                               | 2,400                         |
| D1.75R                | 13,700                               | 1,860                         | 11,400   | 1,160                         | 8,200                                 | 900                           | 27,300                               | 4,800                         | 13,600                               | 2,400                         |
| D2R                   | 12,000                               | 1,860                         | 10,000   | 1,140                         | 7,200                                 | 900                           | 24,000                               | 4,800                         | 12,000                               | 2,400                         |
| D2.5R                 | 9,600                                | 1,860                         | 8,000  | 1,120                         | 5,700                                 | 900                           | 19,000                               | 4,800                         | 9,600                                | 2,400                         |
| D3R                   | 8,000                                | 1,860                         | 6,400  | 1,080                         | 4,800                                 | 900                           | 16,000                               | 4,800                         | 8,000                                | 2,400                         |
| D4R                   | 6,000                                | 1,800                         | 4,800  | 1,080                         | 3,600                                 | 900                           | 12,000                               | 4,800                         | 6,000                                | 2,400                         |
| D5R                   | 4,800                                | 1,800                         | 3,800  | 1,080                         | 2,900                                 | 900                           | 9,600                                | 4,600                         | 4,800                                | 2,300                         |
| D6R                   | 4,000                                | 1,800                         | 3,200  | 1,080                         | 2,400                                 | 900                           | 8,000                                | 4,200                         | 4,000                                | 2,100                         |
| D7R                   | 3,400                                | 1,800                         | 2,750  | 1,080                         | 2,050                                 | 900                           | 6,800                                | 4,000                         | 3,400                                | 2,000                         |
| D8R                   | 3,000                                | 1,800                         | 2,400  | 1,080                         | 1,800                                 | 900                           | 6,000                                | 4,000                         | 3,000                                | 2,000                         |
| D10R                  | 2,400                                | 1,800                         | 1,900  | 1,040                         | 1,450                                 | 900                           | 4,800                                | 4,000                         | 2,400                                | 2,000                         |
| D12.5R                | 1,900                                | 1,440                         | 1,520  | 450                           | 1,160                                 | 840                           | 3,840                                | 3,800                         | 1,920                                | 1,880                         |

|                      |   |  |  |
|----------------------|---|--|--|
| DEPTH OF CUT<br>加工深度 |  |  | <ul style="list-style-type: none"> <li>-0.16XR R ≤ 0.3 (~45HRC)</li> <li>-0.25XR R ≤ 3 (~45HRC)</li> <li>-0.17XR R ≥ 4 (~45HRC)</li> <li>-0.05XR (~50HRC)</li> </ul> |
|----------------------|---|--|--|

產品規格表 **P214-215**  
Specification page

## ● SURTA 3 Flutes Standard Cutting Conditions 標準切削

| Work Material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>碳素鋼, 合金鋼-HRC30 |                            | Alloy Steels, Tool Steels<br>調質鋼, SKD61, NAK等<br>Prehardened Steels, AISI H13<br>合金鋼, 工具鋼HRC30~45 |                                      | Austenitic stainless Steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |               | Hardened Steels<br>SKD61, SKD11, NAK,<br>STAVAX等<br>AISI H13<br>熱處理鋼HRC45~50 |                           |               |                                      |                            |               |
|-----------------------|--|----------------------------|---|--------------------------------------|---|---------------|--|---------------------------|---------------|--------------------------------------|----------------------------|---------------|
| Cutting Speed<br>切削速度 | 50~100m/min  |                            | 50~70m/min  |                                      | 30~60m/min  |               | 20~40m/min   |                           |               |                                      |                            |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |   | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate(mm/min)<br>進給速度   |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate(mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |               |
|                       |  | Side<br>Milling<br>側面      | Slotting<br>溝   |                                      | Side<br>Milling<br>側面   | Slotting<br>溝 |  | Side<br>Milling<br>側面     | Slotting<br>溝 |                                      | Side<br>Milling<br>側面      | Slotting<br>溝 |
| 2                     | 11,000   | 180                        | 180   | 7,200                                | 110   | 110           | 6,000  | 90                        | 90            | 4,800                                | 45                         | 45            |
| 3                     | 8,500  | 200                        | 160   | 5,300                                | 130   | 100           | 4,400  | 110                       | 66            | 3,200                                | 55                         | 44            |
| 4                     | 7,200  | 360                        | 290   | 4,400                                | 220   | 180           | 3,000  | 180                       | 110           | 2,400                                | 67                         | 54            |
| 5                     | 6,000  | 380                        | 300   | 3,600                                | 230   | 180           | 2,400  | 190                       | 110           | 1,900                                | 70                         | 56            |
| 6                     | 5,300  | 420                        | 340   | 3,200                                | 240   | 190           | 2,200  | 210                       | 130           | 1,600                                | 75                         | 60            |
| 8                     | 4,000  | 450                        | 360   | 2,400                                | 240   | 190           | 1,600  | 220                       | 130           | 1,200                                | 65                         | 50            |
| 10                    | 3,200  | 390                        | 310   | 1,900                                | 190   | 150           | 1,300  | 190                       | 110           | 1,000                                | 65                         | 50            |
| 12                    | 2,700  | 330                        | 260   | 1,600                                | 160   | 130           | 1,000  | 150                       | 90            | 800                                  | 65                         | 50            |

|                                    |  |  |  |  |
|------------------------------------|--|--|--|--|
| 切削量基準<br>Depth of cut<br>(D:直徑Dia) |  |  |  |  |
|------------------------------------|--|--|--|--|

### ▲ Caution

1. Please use SI coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless Steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

### ▲ 注意事項

1. 切削50~60 HRC 以上之材料時，請使用SI鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
3. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之1/3以下。



FHPS

產品規格表 **P218-220**  
Specification page

FHP

產品規格表 **P221**  
Specification page

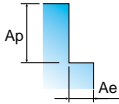
FHPM/FHPL

產品規格表 **P222**  
Specification page

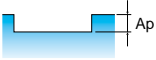
CRFHP

產品規格表 **P223**  
Specification page

## ● FHPS, FHP, FHPM/FHPL, CRFHP 4 Flutes Side Milling 側面切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵  |                      | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD-HRC30<br>合金鋼、工具鋼 |                      | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30-38 |                      | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                      | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45-55 |                      | Hardened steels,<br>調質鋼 HRC55-60  |                      |    |    |      |      |  |  |  |  |    |    |    |       |
|--------------------------|---|----------------------|---|----------------------|--|----------------------|---|----------------------|---|----------------------|---|----------------------|----|----|------|------|--|--|--|--|----|----|----|-------|
|                          | 100 m/min   |                      | 78 m/min  |                      | 66 m/min   |                      | 62 m/min  |                      | 60 m/min  |                      | 30 m/min  |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| Cutting Speed<br>切削速度    | Speed(mm <sup>-1</sup> )<br>迴轉速度  |                      | Speed(mm/min)<br>送速度  |                      | Speed(mm <sup>-1</sup> )<br>迴轉速度   |                      | Speed(mm/min)<br>送速度  |                      | Speed(mm <sup>-1</sup> )<br>迴轉速度  |                      | Speed(mm/min)<br>送速度  |                      |    |    |      |      |  |  |  |  |    |    |    |       |
|                          | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                  | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed(mm/min)<br>送速度 |    |    |      |      |  |  |  |  |    |    |    |       |
| 3                        | 10600   | 975                  | 8300  | 760                  | 7000   | 560                  | 6600  | 555                  | 6035  | 485                  | 3200  | 190                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 4                        | 79500   | 1000                 | 6200  | 820                  | 5250   | 565                  | 4950  | 590                  | 4750  | 515                  | 2400  | 190                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 5                        | 6350  | 1050                 | 4950  | 845                  | 4200   | 590                  | 3950  | 630                  | 3800  | 535                  | 1900  | 190                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 6                        | 5300  | 1250                 | 4150  | 945                  | 3500   | 700                  | 3300  | 660                  | 3200  | 545                  | 1600  | 190                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 8                        | 4000  | 1250                 | 3100  | 895                  | 2650   | 660                  | 2450  | 640                  | 2400  | 555                  | 1200  | 175                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 10                       | 3200  | 1100                 | 2500  | 855                  | 2100   | 605                  | 1950  | 590                  | 1900  | 525                  | 955   | 160                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 12                       | 2650  | 1100                 | 2050  | 850                  | 1750   | 565                  | 1650  | 535                  | 1600  | 475                  | 795   | 160                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 16                       | 2000  | 955                  | 1550  | 745                  | 1300   | 500                  | 1250  | 445                  | 1200  | 400                  | 595   | 160                  |    |    |      |      |  |  |  |  |    |    |    |       |
| 20                       | 1600  | 765                  | 1250  | 595                  | 1050   | 455                  | 985   | 395                  | 955   | 355                  | 475   | 160                  |    |    |      |      |  |  |  |  |    |    |    |       |
| Depth of cut<br>加工深度     |  <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.2D</td></tr> </table> |                      |   |                      |  |                      | Ap  | Ae                   | 1.5D  | 0.2D                 | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1.5D</td><td>0.1D</td></tr> </table> |                      | Ap | Ae | 1.5D | 0.1D | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>1D</td><td>0.05D</td></tr> </table> |  |  |  | Ap | Ae | 1D | 0.05D |
|                          | Ap  | Ae                   |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| 1.5D                     | 0.2D  |                      |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| Ap                       | Ae  |                      |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| 1.5D                     | 0.1D  |                      |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| Ap                       | Ae  |                      |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |
| 1D                       | 0.05D   |                      |   |                      |  |                      |   |                      |   |                      |   |                      |    |    |      |      |  |  |  |  |    |    |    |       |

## ● FHPS, FHP, FHPM/FHPL, CRFHP 4 Flutes Slotting 溝標準切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                      | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD-HRC30<br>合金鋼、工具鋼 |                      | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30-38 |                      | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                      | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45-55 |                      | Hardened steels,<br>調質鋼 HRC55-60 |                      |
|--------------------------|--|----------------------|---|----------------------|--|----------------------|---|----------------------|---|----------------------|----------------------------------|----------------------|
|                          | 100 m/min  |                      | 78 m/min  |                      | 66 m/min   |                      | 62 m/min  |                      | 60 m/min  |                      | 30 m/min                         |                      |
| Cutting Speed<br>切削速度    | Speed(mm <sup>-1</sup> )<br>迴轉速度   |                      | Speed(mm/min)<br>送速度  |                      | Speed(mm <sup>-1</sup> )<br>迴轉速度   |                      | Speed(mm/min)<br>送速度  |                      | Speed(mm <sup>-1</sup> )<br>迴轉速度  |                      | Speed(mm/min)<br>送速度             |                      |
|                          | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                  | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed(mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Speed(mm/min)<br>送速度 |
| 3                        | 8500   | 705                  | 6350  | 959                  | 5850   | 455                  | 5500  | 400                  | 4450  | 320                  | 2100                             | 110                  |
| 4                        | 6350   | 705                  | 4750  | 675                  | 4400   | 455                  | 4150  | 450                  | 3350  | 360                  | 1600                             | 120                  |
| 5                        | 5100   | 715                  | 3800  | 660                  | 3500   | 475                  | 3300  | 475                  | 2650  | 385                  | 1250                             | 125                  |
| 6                        | 4250   | 715                  | 3200  | 560                  | 2900   | 500                  | 2750  | 495                  | 2250  | 400                  | 1050                             | 125                  |
| 8                        | 3200   | 660                  | 2400  | 550                  | 2200   | 545                  | 2050  | 515                  | 1650  | 415                  | 795                              | 125                  |
| 10                       | 2550   | 610                  | 1900  | 535                  | 1750   | 475                  | 1650  | 470                  | 1350  | 380                  | 635                              | 115                  |
| 12                       | 2100   | 610                  | 1600  | 475                  | 1450   | 450                  | 1400  | 440                  | 1100  | 355                  | 530                              | 115                  |
| 16                       | 1600   | 610                  | 1200  | 430                  | 1100   | 370                  | 1050  | 370                  | 835   | 300                  | 400                              | 88                   |
| 20                       | 1250   | 510                  | 955   | 380                  | 875  | 350                  | 830   | 330                  | 670   | 265                  | 320                              | 89                   |
| Depth of cut<br>加工深度     |  <p>Ap=0.5D</p>         |                      |   |                      |  |                      | <p>Ap=0.05D</p>   |                      |   |                      |                                  |                      |

FHPS

產品規格表 **P218-220**  
Specification page

FHP

產品規格表 **P221**  
Specification page

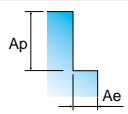
FHPM/FHPL

產品規格表 **P222**  
Specification page


CRFHP

產品規格表 **P223**  
Specification page

### ● FHPS, FHP, FHPM/FHPL, CRFHP 4 Flutes High Speed Side Milling 高速側面切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(-750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵   |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD-HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30-38 |                       | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45-55 |                       | Hardened steels,<br>調質鋼 HRC55-60 |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
|--------------------------|--|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|---|-----------------------|----------------------------------|-----------------------|--|--|--|--|----|----|--------|------------|--------|------------|-------------|--|--|--|--|--|----|----|--------|----------|--------|----------|-------------|--|
| Cutting Speed<br>切削速度    | 100 m/min  |                       | 78 m/min  |                       | 66 m/min   |                       | 62 m/min  |                       | 60 m/min  |                       | 30 m/min                         |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Mill DIA. (mm)<br>直徑     | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度 | Speed (mm/min)<br>送速度 |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 3                        | 21200  | 2150                  | 21200   | 2400                  | 21200  | 1300                  | 15900   | 1150                  | 10600   | 680                   | 8500                             | 440                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 4                        | 15900  | 2050                  | 15900   | 2300                  | 15900  | 1300                  | 11900   | 1250                  | 79500   | 795                   | 6350                             | 460                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 5                        | 12700  | 1900                  | 12700   | 2150                  | 12700  | 1250                  | 9550  | 1350                  | 6350  | 840                   | 5100                             | 510                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 6                        | 10600  | 3050                  | 10600   | 2650                  | 10600  | 2000                  | 7950  | 1450                  | 5300  | 910                   | 4250                             | 610                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 8                        | 7950   | 2800                  | 7950  | 2400                  | 7950   | 1900                  | 5950  | 1400                  | 4000  | 860                   | 3200                             | 575                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 10                       | 6350   | 2550                  | 6350  | 2200                  | 6350   | 1850                  | 4750  | 1350                  | 3200  | 830                   | 2550                             | 510                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 12                       | 5300   | 2550                  | 5300  | 2200                  | 5300   | 1800                  | 4000  | 1350                  | 2650  | 830                   | 2100                             | 510                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 16                       | 4000   | 1900                  | 4000  | 1900                  | 4000   | 1700                  | 3000  | 1350                  | 2000  | 830                   | 1600                             | 510                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| 20                       | 3200   | 1550                  | 3200  | 1550                  | 3200   | 1550                  | 2400  | 1150                  | 1600  | 730                   | 1250                             | 510                   |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Depth of cut<br>加工深度     |  <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>D &lt; Ø6</td><td>1.5D 0.02D</td></tr> <tr><td>Ø6 ≤ D</td><td>1.5D 0.05D</td></tr> <tr><td colspan="2">AeMax=0.5mm</td></tr> </table> |                       |   |                       | Ap   | Ae                    | D < Ø6  | 1.5D 0.02D            | Ø6 ≤ D  | 1.5D 0.05D            | AeMax=0.5mm                      |                       | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>D &lt; Ø6</td><td>1.5D 0.01D</td></tr> <tr><td>Ø6 ≤ D</td><td>1.5D 0.02D</td></tr> <tr><td colspan="2">AeMax=0.5mm</td></tr> </table> |  |  |  | Ap | Ae | D < Ø6 | 1.5D 0.01D | Ø6 ≤ D | 1.5D 0.02D | AeMax=0.5mm |  | <table border="1"> <tr><td>Ap</td><td>Ae</td></tr> <tr><td>D &lt; Ø6</td><td>1D 0.01D</td></tr> <tr><td>Ø6 ≤ D</td><td>1D 0.02D</td></tr> <tr><td colspan="2">AeMax=0.5mm</td></tr> </table> |  |  |  | Ap | Ae | D < Ø6 | 1D 0.01D | Ø6 ≤ D | 1D 0.02D | AeMax=0.5mm |  |
| Ap                       | Ae   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| D < Ø6                   | 1.5D 0.02D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Ø6 ≤ D                   | 1.5D 0.05D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| AeMax=0.5mm              |  |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Ap                       | Ae   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| D < Ø6                   | 1.5D 0.01D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Ø6 ≤ D                   | 1.5D 0.02D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| AeMax=0.5mm              |  |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Ap                       | Ae   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| D < Ø6                   | 1D 0.01D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| Ø6 ≤ D                   | 1D 0.02D   |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |
| AeMax=0.5mm              |  |                       |   |                       |  |                       |   |                       |   |                       |                                  |                       |  |  |  |  |    |    |        |            |        |            |             |  |  |  |  |  |    |    |        |          |        |          |             |  |

### ● FHPS, FHP, FHPM/FHPL, CRFHP 4 Flutes High Speed Slotting 高速溝標準切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(-750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵       |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD-HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30-38 |                       | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                       |
|--------------------------|--|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|
| Cutting Speed<br>切削速度    | 100 m/min  |                       | 78 m/min  |                       | 66 m/min   |                       | 62 m/min  |                       |
| Mill DIA. (mm)<br>直徑     | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 |
| 3                        | 12700  | 1050                  | 10600   | 935                   | 9550   | 745                   | 6350  | 460                   |
| 4                        | 9550   | 1150                  | 7950  | 1000                  | 7150   | 745                   | 5150  | 560                   |
| 5                        | 7650   | 1200                  | 7000  | 1100                  | 6350   | 865                   | 4150  | 595                   |
| 6                        | 3650   | 1550                  | 5850  | 1150                  | 5300   | 910                   | 3700  | 670                   |
| 8                        | 4750   | 1450                  | 4400  | 1300                  | 4000   | 985                   | 2800  | 690                   |
| 10                       | 3800   | 1400                  | 3500  | 1200                  | 3200   | 865                   | 2250  | 635                   |
| 12                       | 3200   | 1250                  | 2900  | 1150                  | 2650   | 815                   | 1850  | 595                   |
| 16                       | 2400   | 1050                  | 2200  | 965                   | 2000   | 675                   | 1400  | 500                   |
| 20                       | 1900   | 840                   | 1750  | 770                   | 1600   | 635                   | 1100  | 445                   |
| Depth of cut<br>加工深度     |  <p>Ap=0.2D<br/>ApMax=3mm</p> |                       |   |                       |  |                       |   |                       |

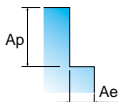
Unit/單位: mm

FHPC/FHPMC/FHPLC CRFHPC


產品規格表 **P226** 產品規格表 **P227**

Specification page Specification page

## ● FHPC, FHPMC, FHPLC, CRFHPC 4 Flutes Side Milling 側面切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(-750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、<br>鑄鐵  |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>-HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55,<br>HPM1<br>調質鋼 HRC30-38 |                       | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels,<br>調質鋼 HRC45-55 |                       | Hardened steels,<br>調質鋼 HRC55-60  |                       |    |    |      |      |  |  |  |  |    |    |    |       |
|--------------------------|---|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|----|----|------|------|--|--|--|--|----|----|----|-------|
| Cutting Speed<br>切削速度    | 100 m/min   |                       | 78 m/min  |                       | 66 m/min  |                       | 62 m/min  |                       | 60 m/min   |                       | 30 m/min  |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| Mill DIA. (mm)<br>直徑     | Speed (mm <sup>1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 |    |    |      |      |  |  |  |  |    |    |    |       |
| 6                        | 4240  | 1250                  | 3320  | 945                   | 2800  | 700                   | 2640  | 660                   | 2560   | 545                   | 1280  | 190                   |    |    |      |      |  |  |  |  |    |    |    |       |
| 8                        | 3200  | 1250                  | 2480  | 895                   | 2120  | 660                   | 1960  | 640                   | 1920   | 555                   | 960   | 175                   |    |    |      |      |  |  |  |  |    |    |    |       |
| 10                       | 2560  | 1100                  | 2000  | 855                   | 1680  | 605                   | 1560  | 590                   | 1520   | 525                   | 764   | 160                   |    |    |      |      |  |  |  |  |    |    |    |       |
| 12                       | 2120  | 1100                  | 1640  | 850                   | 1400  | 565                   | 1320  | 535                   | 1280   | 475                   | 636   | 160                   |    |    |      |      |  |  |  |  |    |    |    |       |
| 16                       | 1600  | 955                   | 1240  | 745                   | 1040  | 500                   | 1000  | 445                   | 960  | 400                   | 476   | 160                   |    |    |      |      |  |  |  |  |    |    |    |       |
| 20                       | 1280  | 765                   | 1000  | 595                   | 840   | 455                   | 788   | 395                   | 764  | 355                   | 380   | 160                   |    |    |      |      |  |  |  |  |    |    |    |       |
| Depth of cut<br>加工深度     |  <table border="1"> <tr> <td>Ap</td> <td>Ae</td> </tr> <tr> <td>1.5D</td> <td>0.2D</td> </tr> </table> |                       |   |                       |   |                       | Ap  | Ae                    | 1.5D   | 0.2D                  | <table border="1"> <tr> <td>Ap</td> <td>Ae</td> </tr> <tr> <td>1.5D</td> <td>0.1D</td> </tr> </table> |                       | Ap | Ae | 1.5D | 0.1D | <table border="1"> <tr> <td>Ap</td> <td>Ae</td> </tr> <tr> <td>1D</td> <td>0.05D</td> </tr> </table> |  |  |  | Ap | Ae | 1D | 0.05D |
| Ap                       | Ae  |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| 1.5D                     | 0.2D  |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| Ap                       | Ae  |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| 1.5D                     | 0.1D  |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| Ap                       | Ae  |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |
| 1D                       | 0.05D   |                       |   |                       |   |                       |   |                       |  |                       |   |                       |    |    |      |      |  |  |  |  |    |    |    |       |

## ● FHPC, FHPMC, FHPLC, CRFHPC 4 Flutes 4 Flutes Slotting 溝標準切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(-750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>-HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30-38 |                       | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38-45 |                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45-55 |                       | Hardened steels,<br>調質鋼 HRC55-60 |                       |
|--------------------------|--|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|---|-----------------------|----------------------------------|-----------------------|
| Cutting Speed<br>切削速度    | 100 m/min  |                       | 78 m/min  |                       | 66 m/min   |                       | 62 m/min  |                       | 60 m/min  |                       | 30 m/min                         |                       |
| Mill DIA. (mm)<br>直徑     | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed (mm <sup>1</sup> )<br>迴轉速度 | Speed (mm/min)<br>送速度 |
| 6                        | 3400   | 715                   | 2560  | 560                   | 2320   | 500                   | 2200  | 495                   | 1800  | 400                   | 840                              | 125                   |
| 8                        | 2560   | 660                   | 1920  | 550                   | 1760   | 545                   | 1640  | 515                   | 1320  | 415                   | 636                              | 125                   |
| 10                       | 2040   | 610                   | 1520  | 535                   | 1400   | 475                   | 1320  | 470                   | 1080  | 380                   | 508                              | 115                   |
| 12                       | 1680   | 610                   | 1280  | 475                   | 1160   | 450                   | 1120  | 440                   | 880   | 355                   | 424                              | 115                   |
| 16                       | 1280   | 610                   | 960   | 430                   | 880  | 370                   | 840   | 370                   | 668   | 300                   | 320                              | 88                    |
| 20                       | 1000   | 510                   | 764   | 380                   | 700  | 350                   | 664   | 330                   | 536   | 265                   | 256                              | 89                    |
| Depth of cut<br>加工深度     |  <p>Ap = 0.5D</p>       |                       |   |                       |  |                       |   |                       | Ap = 0.05D  |                       |                                  |                       |

產品規格表 **P231**  
Specification page

## ● HPSS 3 Flutes Side Milling 側面切削

| Working material<br>被切削材 | Carbon steels, Alloy steels<br>~HRC30<br>S50C, SCM, SS 碳素鋼、合金鋼 |                                | Mold steels<br>HRC30~45<br>SKD61 模具鋼 |                                | Stainless steels<br>SUS304, SUS316<br>不鏽鋼 |                                |
|--------------------------|--|--------------------------------|--------------------------------------|--------------------------------|---|--------------------------------|
|                          | (mm)<br>外徑   | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                 | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                      | rpm(mm <sup>-1</sup> )<br>迴轉速度 |
| 2                        | 11000  | 600                            | 7200                                 | 310                            | 6000                                      | 210                            |
| 3                        | 8500   | 770                            | 5300                                 | 380                            | 4400                                      | 220                            |
| 4                        | 7200   | 850                            | 4400                                 | 480                            | 3700                                      | 250                            |
| 6                        | 5300   | 940                            | 3200                                 | 490                            | 2700                                      | 270                            |
| 8                        | 4000   | 1000                           | 2400                                 | 560                            | 2000                                      | 280                            |
| 10                       | 3200   | 1000                           | 1900                                 | 480                            | 1600                                      | 300                            |
| 12                       | 2700   | 950                            | 1600                                 | 440                            | 1300                                      | 300                            |
| 16                       | 2000   | 720                            | 1200                                 | 350                            | 1000                                      | 260                            |
| 20                       | 1600   | 600                            | 1000                                 | 290                            | 800                                       | 240                            |

Depth of cut  
切削基準

$\leq 0.2D (D > \phi 3)$   
 $\leq 0.1D (D \leq \phi 3)$

## ● HPSS 3 Flutes Slot Milling 溝標準切削

| Working material<br>被切削材 | Carbon steels, Alloy steels<br>~HRC30<br>S50C, SCM, SS 碳素鋼、合金鋼 |                                | Mold steels<br>HRC30~45<br>SKD61 模具鋼 |                                | Stainless steels<br>SUS304, SUS316<br>不鏽鋼 |                                |
|--------------------------|--|--------------------------------|--------------------------------------|--------------------------------|---|--------------------------------|
|                          | (mm)<br>外徑   | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                 | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                      | rpm(mm <sup>-1</sup> )<br>迴轉速度 |
| 2                        | 11000  | 500                            | 7200                                 | 260                            | 6000                                      | 130                            |
| 3                        | 8500   | 640                            | 5300                                 | 320                            | 4200                                      | 130                            |
| 4                        | 7200   | 650                            | 4400                                 | 370                            | 3400                                      | 140                            |
| 6                        | 5300   | 720                            | 3200                                 | 380                            | 2200                                      | 140                            |
| 8                        | 4000   | 780                            | 2400                                 | 430                            | 1600                                      | 140                            |
| 10                       | 3200   | 770                            | 1900                                 | 370                            | 1300                                      | 150                            |
| 12                       | 2700   | 730                            | 1600                                 | 340                            | 1100                                      | 150                            |
| 16                       | 2000   | 600                            | 1200                                 | 290                            | 800                                       | 130                            |
| 20                       | 1600   | 500                            | 1000                                 | 240                            | 640                                       | 120                            |

Depth of cut  
切削基準

## ● HPSS 3 Flutes Plung Milling 垂直標準切削

| Working material<br>被切削材 | Carbon steels, Alloy steels<br>~HRC30<br>S50C, SCM, SS 碳素鋼、合金鋼 |                                | Mold steels<br>HRC30~45<br>SKD61 模具鋼 |                                | Stainless steels<br>SUS304, SUS316<br>不鏽鋼 |                                |
|--------------------------|--|--------------------------------|--------------------------------------|--------------------------------|---|--------------------------------|
|                          | (mm)<br>外徑   | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                 | rpm(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                      | rpm(mm <sup>-1</sup> )<br>迴轉速度 |
| 2                        | 11000  | 200                            | 7200                                 | 140                            | 6000                                      | 30                             |
| 3                        | 8500   | 250                            | 5300                                 | 180                            | 4400                                      | 50                             |
| 4                        | 7200   | 300                            | 4400                                 | 210                            | 3700                                      | 60                             |
| 6                        | 5300   | 300                            | 3200                                 | 210                            | 2700                                      | 70                             |
| 8                        | 4000   | 320                            | 2400                                 | 220                            | 2000                                      | 80                             |
| 10                       | 3200   | 340                            | 1900                                 | 240                            | 1600                                      | 70                             |
| 12                       | 2700   | 320                            | 1600                                 | 220                            | 1300                                      | 70                             |
| 16                       | 2000   | 250                            | 1200                                 | 180                            | 1000                                      | 55                             |
| 20                       | 1600   | 200                            | 1000                                 | 140                            | 800                                       | 55                             |

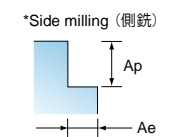
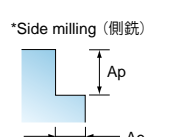
Depth of cut  
切削基準

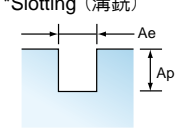
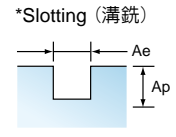
產品規格表 **P234**  
Specification page

| ● KKH Side Milling 側面切削      |  |                         |                                    |                         |                                |                         |                                |                         |
|------------------------------|--|-------------------------|------------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|
| Work Material 被削材            | SS400, AISI 1050, SCM 鑄鐵, FC250等一般構造鋼, 碳素鋼, -HRC30 |                         | AISI H13, AISI D2等合金鋼, 工具鋼HRC30-35 |                         | SKD61等淬火鋼HRC45-50              |                         | Inconel 耐熱合金高鎳等                |                         |
| Diameter 直徑 (mm)             | Speed 迴轉速 (min <sup>-1</sup> )                     | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> )     | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> ) | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> ) | Feed Rate 進給速度 (mm/min) |
| 6                            | 6400   | 750                     | 3700                               | 390                     | 2700                           | 110                     | 2100                           | 75                      |
| 8                            | 4800   | 780                     | 2800                               | 420                     | 2000                           | 140                     | 1600                           | 95                      |
| 10                           | 3800   | 790                     | 2200                               | 420                     | 1600                           | 150                     | 1300                           | 105                     |
| 12                           | 3200   | 790                     | 1900                               | 420                     | 1300                           | 150                     | 1100                           | 110                     |
| 16                           | 2400   | 770                     | 1400                               | 390                     | 1000                           | 150                     | 800                            | 110                     |
| 20                           | 1900   | 760                     | 1100                               | 370                     | 800                            | 140                     | 600                            | 100                     |
| 25                           | 1500   | 600                     | 900                                | 300                     | 640                            | 115                     | 480                            | 80                      |
| Depth of cut 切削基準量 (D=直徑Dia) | *Side milling (側銑)                                 |                         |                                    |                         | *Side milling (側銑)             |                         |                                |                         |

| ● KKH Slotting 溝標準切削         |  |                         |                                    |                         |                                |                         |                                |                         |
|------------------------------|--|-------------------------|------------------------------------|-------------------------|--------------------------------|-------------------------|--------------------------------|-------------------------|
| Work Material 被削材            | SS400, AISI 1050, SCM 鑄鐵, FC250等一般構造鋼, 碳素鋼, -HRC30 |                         | AISI H13, AISI D2等合金鋼, 工具鋼HRC30-35 |                         | SKD61等淬火鋼HRC45-50              |                         | Inconel 耐熱合金高鎳等                |                         |
| Diameter 直徑 (mm)             | Speed 迴轉速 (min <sup>-1</sup> )                     | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> )     | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> ) | Feed Rate 進給速度 (mm/min) | Speed 迴轉速 (min <sup>-1</sup> ) | Feed Rate 進給速度 (mm/min) |
| 6                            | 5300   | 580                     | 3200                               | 290                     | 1600                           | 55                      | 1100                           | 30                      |
| 8                            | 4000   | 600                     | 2400                               | 320                     | 1200                           | 70                      | 800                            | 35                      |
| 10                           | 3200   | 600                     | 1900                               | 310                     | 1000                           | 70                      | 600                            | 35                      |
| 12                           | 2700   | 600                     | 1600                               | 310                     | 800                            | 75                      | 500                            | 40                      |
| 16                           | 2000   | 570                     | 1200                               | 320                     | 600                            | 75                      | 400                            | 45                      |
| 20                           | 1600   | 540                     | 1000                               | 270                     | 500                            | 70                      | 300                            | 40                      |
| 25                           | 1300   | 440                     | 760                                | 205                     | 380                            | 55                      | 240                            | 30                      |
| Depth of cut 切削基準量 (D=直徑Dia) | *Slotting (溝銑)                                     |                         |                                    |                         | *Slotting (溝銑)                 |                         |                                |                         |

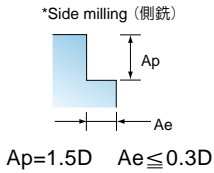
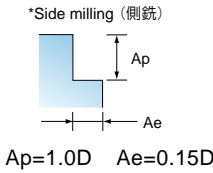
產品規格表 **P235**  
Specification page

| ● KKM Side Milling 側面切削            |  |                               |   |                               |  |                               |   |                               |                                      |                               |  |
|------------------------------------|--|-------------------------------|---|-------------------------------|--|-------------------------------|---|-------------------------------|--------------------------------------|-------------------------------|--|
| Work Material<br>被削材               | Mild steels Carbon steels,<br>Cast iron<br>SS400.S55c.FC250<br>(-750N/mm2)<br>一般構造鋼.碳素鋼.鑄鐵   |                               | Alloy Steels.Tool Steels.<br>SCM.SKT.SKS.SKD<br>~HRC30合金鋼.工具鋼 |                               | Hardened steels.<br>Prehardened steels.<br>(Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼HRC30~38 |                               | Hardened steels.<br>Titanium alloys.<br>Heat resistant alloys<br>steels.<br>調質鋼HRC45~55   |                               | Hardened steels.<br>調質鋼HRC55~60      |                               |  |
| Diameter<br>直徑<br>(mm)             | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )                          | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |  |
| 6                                  | 6760   | 1280                          | 5250  | 960                           | 4450   | 712                           | 4050  | 556                           | 2100                                 | 200                           |  |
| 8                                  | 5050   | 1240                          | 3950  | 880                           | 3350   | 652                           | 3050  | 540                           | 1600                                 | 180                           |  |
| 10                                 | 4100   | 1160                          | 3200  | 840                           | 2700   | 580                           | 2450  | 508                           | 1250                                 | 172                           |  |
| 12                                 | 3400   | 1120                          | 2650  | 800                           | 2250   | 576                           | 2050  | 484                           | 1050                                 | 168                           |  |
| 16                                 | 2550   | 960                           | 2000  | 752                           | 1700   | 508                           | 1550  | 404                           | 765                                  | 168                           |  |
| 20                                 | 2050   | 788                           | 1600  | 604                           | 1350   | 472                           | 1250  | 368                           | 635                                  | 160                           |  |
| 25                                 | 1650   | 704                           | 1250  | 540                           | 1100   | 428                           | 990   | 316                           | 510                                  | 148                           |  |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Side milling (側銑)</p>  <p>Ae: <math>\leq 0.3 D</math> Ap: 1.5 D</p> |                               |   |                               |  |                               | <p>*Side milling (側銑)</p>  <p>Ae: <math>\leq 0.15 D</math> Ap: 1.0 D</p> |                               |                                      |                               |  |

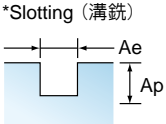
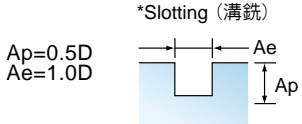
| ● KKM Slotting 溝標準切削               |   |                               |   |                               |  |                               |  |                               |                                      |                               |  |
|------------------------------------|---|-------------------------------|---|-------------------------------|--|-------------------------------|--|-------------------------------|--------------------------------------|-------------------------------|--|
| Work Material<br>被削材               | Mild steels Carbon steels,<br>Cast iron<br>SS400.S55c.FC250<br>(-750N/mm2)<br>一般構造鋼.碳素鋼.鑄鐵  |                               | Alloy Steels.Tool Steels.<br>SCM.SKT.SKS.SKD<br>~HRC30合金鋼.工具鋼 |                               | Hardened steels.<br>Prehardened steels.<br>(Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼HRC30~38 |                               | Hardened steels.<br>Titanium alloys.<br>Heat resistant alloys<br>steels.<br>調質鋼HRC45~55  |                               | Hardened steels.<br>調質鋼HRC55~60      |                               |  |
| Diameter<br>直徑<br>(mm)             | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )                          | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )   | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) |  |
| 6                                  | 5150  | 592                           | 4250  | 508                           | 3950   | 460                           | 3600   | 436                           | 1250                                 | 116                           |  |
| 8                                  | 3850  | 480                           | 3200  | 440                           | 2950   | 440                           | 2700   | 408                           | 945                                  | 124                           |  |
| 10                                 | 3100  | 464                           | 2550  | 432                           | 2350   | 384                           | 2150   | 364                           | 760                                  | 116                           |  |
| 12                                 | 2600  | 448                           | 2150  | 380                           | 1950   | 368                           | 1800   | 348                           | 630                                  | 116                           |  |
| 16                                 | 1950  | 444                           | 1600  | 344                           | 1500   | 296                           | 1350   | 292                           | 475                                  | 88                            |  |
| 20                                 | 1550  | 380                           | 1300  | 304                           | 1200   | 284                           | 1100   | 264                           | 380                                  | 88                            |  |
| 25                                 | 1250  | 360                           | 1000  | 292                           | 945  | 252                           | 865  | 188                           | 300                                  | 84                            |  |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Slotting (溝銑)</p>  <p>Ap: <math>\leq 1D</math></p> |                               |   |                               |  |                               | <p>*Slotting (溝銑)</p>  <p>Ap: <math>\leq 0.5 D</math></p> |                               |                                      |                               |  |

產品規格表 **P236**  
Specification page

### • KKF Side Milling 側面切削

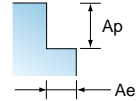
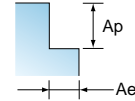
| Work Material<br>被削材                | Mild steels Carbon steels,<br>Cast iron<br>SS400.S55c.FC250<br>(-750N/mm2)<br>一般構造鋼.碳素鋼.鑄鐵   |                            | Alloy Steels.Tool Steels.<br>SCM.SKT.SKS.SKD<br>~HRC30合金鋼.工具鋼 |                            | Hardened steels.<br>Prehardened steels.<br>(Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼HRC30~38 |                            | Hardened steels.<br>Titanium alloys.<br>Heat resistant alloys<br>steels.<br>調質鋼HRC45~55   |                            | Hardened steels.<br>調質鋼HRC55~60   |                            |
|-------------------------------------|--|----------------------------|---|----------------------------|--|----------------------------|---|----------------------------|-----------------------------------|----------------------------|
| Max Cutting Speed (V)<br>最大切削速度 (V) | 100m/min   |                            | 78m/min   |                            | 66m/min  |                            | 60m/min   |                            | 30m/min                           |                            |
| Diameter<br>直徑 (mm)                 | Speed<br>迴轉速 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )                             | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )   | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) |
| 6                                   | 4240   | 1250                       | 3320  | 945                        | 2800   | 700                        | 2560  | 545                        | 1280                              | 190                        |
| 8                                   | 3200   | 1250                       | 2480  | 895                        | 2120   | 660                        | 1920  | 555                        | 960                               | 175                        |
| 10                                  | 2560   | 1100                       | 2000  | 855                        | 1680   | 605                        | 1520  | 525                        | 764                               | 160                        |
| 12                                  | 2120   | 1100                       | 1640  | 850                        | 1400   | 565                        | 1280  | 475                        | 636                               | 160                        |
| 16                                  | 1600   | 955                        | 1240  | 745                        | 1040   | 500                        | 960   | 400                        | 476                               | 160                        |
| 20                                  | 1280   | 765                        | 1000  | 595                        | 840  | 455                        | 764   | 355                        | 380                               | 160                        |
| Depth of cut<br>切削基準量 (D=直徑Dia)     | <p>*Side milling (側銑)</p>  <p>Ap=1.5D Ae≤0.3D</p> |                            |   |                            |  |                            | <p>*Side milling (側銑)</p>  <p>Ap=1.0D Ae=0.15D</p> |                            |                                   |                            |

### • KKF Slotting 溝標準切削

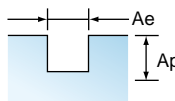
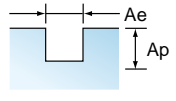
| Work Material<br>被削材                | Mild steels Carbon steels,<br>Cast iron<br>SS400.S55c.FC250<br>(-750N/mm2)<br>一般構造鋼.碳素鋼.鑄鐵                                     |                            | Alloy Steels.Tool Steels.<br>SCM.SKT.SKS.SKD<br>~HRC30合金鋼.工具鋼 |                            | Hardened steels.<br>Prehardened steels.<br>(Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼HRC30~38 |                            | Hardened steels.<br>Titanium alloys.<br>Heat resistant alloys<br>steels.<br>調質鋼HRC45~55  |                            | Hardened steels.<br>調質鋼HRC55~60   |                            |
|-------------------------------------|--|----------------------------|---|----------------------------|--|----------------------------|--|----------------------------|-----------------------------------|----------------------------|
| Max Cutting Speed (V)<br>最大切削速度 (V) | 100m/min   |                            | 78m/min   |                            | 66m/min  |                            | 60m/min  |                            | 30m/min                           |                            |
| Diameter<br>直徑 (mm)                 | Speed<br>迴轉速 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )                             | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> )  | Feed Rate<br>進給速度 (mm/min) | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min) |
| 6                                   | 3400   | 715                        | 2560  | 560                        | 2320   | 500                        | 1800   | 400                        | 840                               | 125                        |
| 8                                   | 2560   | 660                        | 1920  | 550                        | 1760   | 545                        | 1320   | 415                        | 636                               | 125                        |
| 10                                  | 2040   | 610                        | 1520  | 535                        | 1400   | 475                        | 1080   | 380                        | 508                               | 115                        |
| 12                                  | 1680   | 610                        | 1280  | 475                        | 1160   | 450                        | 880  | 355                        | 424                               | 115                        |
| 16                                  | 1280   | 610                        | 960   | 430                        | 880  | 370                        | 668  | 300                        | 320                               | 88                         |
| 20                                  | 1000   | 510                        | 764   | 380                        | 700  | 350                        | 536  | 265                        | 256                               | 89                         |
| Depth of cut<br>切削基準量 (D=直徑Dia)     | <p>*Slotting (溝銑)</p>  <p>Ap=1D Ae=1.0D</p> |                            |   |                            |  |                            | <p>*Slotting (溝銑)</p>  <p>Ap=0.5D Ae=1.0D</p> |                            |                                   |                            |

產品規格表 **P237**  
Specification page

### • KKR Side Milling 側面切削

| Work Material<br>被削材               | SS400, AISI 1050, SCM<br>鑄鐵, FC250等<br>一般構造鋼, 碳素鋼, ~HRC30  |                                      | AISI H13, AISI D2等<br>合金鋼, 工具鋼<br>調質鋼HRC30~35 |                                      | SKD61等<br>淬火鋼HRC45~50   |                                      | Inconel<br>耐熱合金, 英高鎳等         |                                      |
|------------------------------------|--|--------------------------------------|---|--------------------------------------|---|--------------------------------------|-------------------------------|--------------------------------------|
|                                    | Diameter<br>直徑<br>(mm)   | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min)                 | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min)   | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) |
| 6                                  | 6400   | 750                                  | 3700  | 390                                  | 2700  | 110                                  | 2100                          | 75                                   |
| 8                                  | 4800   | 780                                  | 2800  | 420                                  | 2000  | 140                                  | 1600                          | 95                                   |
| 10                                 | 3800   | 790                                  | 2200  | 420                                  | 1600  | 150                                  | 1300                          | 105                                  |
| 12                                 | 3200   | 790                                  | 1900  | 420                                  | 1300  | 150                                  | 1100                          | 110                                  |
| 16                                 | 2400   | 770                                  | 1400  | 390                                  | 1000  | 150                                  | 800                           | 110                                  |
| 20                                 | 1900   | 760                                  | 1100  | 370                                  | 800   | 140                                  | 600                           | 100                                  |
| 25                                 | 1500   | 600                                  | 900   | 300                                  | 640   | 115                                  | 480                           | 80                                   |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Side milling (側銑)</p>  <p>Ae: <math>\leq 0.3 D</math> Ap: 1.5 D</p> |                                      |   |                                      | <p>*Side milling (側銑)</p>  <p>Ae: <math>\leq 0.15 D</math> Ap: 1.0 D</p> |                                      |                               |                                      |

### • KKR Slotting 溝標準切削

| Work Material<br>被削材               | SS400, AISI 1050, SCM<br>鑄鐵, FC250等<br>一般構造鋼, 碳素鋼, ~HRC30  |                                      | AISI H13, AISI D2等<br>合金鋼, 工具鋼<br>調質鋼HRC30~35 |                                      | SKD61等<br>淬火鋼HRC45~50  |                                      | Inconel<br>耐熱合金, 英高鎳等         |                                      |
|------------------------------------|--|--------------------------------------|---|--------------------------------------|--|--------------------------------------|-------------------------------|--------------------------------------|
|                                    | Diameter<br>直徑<br>(mm)   | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min)                 | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min)  | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) |
| 6                                  | 5300   | 580                                  | 3200  | 290                                  | 1600   | 55                                   | 1100                          | 30                                   |
| 8                                  | 4000   | 600                                  | 2400  | 320                                  | 1200   | 70                                   | 800                           | 35                                   |
| 10                                 | 3200   | 600                                  | 1900  | 310                                  | 1000   | 70                                   | 600                           | 35                                   |
| 12                                 | 2700   | 600                                  | 1600  | 310                                  | 800  | 75                                   | 500                           | 40                                   |
| 16                                 | 2000   | 570                                  | 1200  | 320                                  | 600  | 75                                   | 400                           | 45                                   |
| 20                                 | 1600   | 540                                  | 1000  | 270                                  | 500  | 70                                   | 300                           | 40                                   |
| 25                                 | 1300   | 440                                  | 760   | 205                                  | 380  | 55                                   | 240                           | 30                                   |
| Depth of cut<br>切削基準量<br>(D=直徑Dia) | <p>*Slotting (溝銑)</p>  <p>Ap: 1.0 D</p> |                                      |   |                                      | <p>*Slotting (溝銑)</p>  <p>Ap: 0.5 D</p> |                                      |                               |                                      |

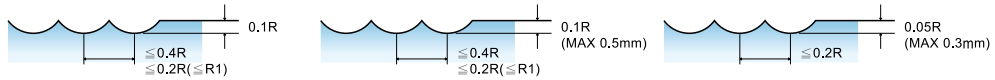


產品規格表 **P240**  
Specification page

## ● KTG 2 Flutes Standard Cutting Conditions 標準標準切削

| Working material<br>被切削材 | Alloy steels, Tool steels,<br>SCM,SKD61,SKD11,NAK,AISI H13,AISI D2 ect<br>合金鋼、工具鋼、預硬鋼 |  |                                  |                      | Hardened steels,<br>SKD61,SKD11,STAVAX,AISI H13 ect<br>調質鋼 HRC45-55 |                |                                  |                      | Hardened steels,<br>SKD11,SKH,SKS,ASP23,AISI H13 ect<br>調質鋼 HRC55-60 |                |                                  |                      |              |                |
|--------------------------|---|--|----------------------------------|----------------------|---|----------------|----------------------------------|----------------------|--|----------------|----------------------------------|----------------------|--------------|----------------|
|                          | R(mm)<br>球頭半徑   | Inclination of<br>Machining<br>Surface<br>加工面<br>傾斜角 | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)  |                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)   |                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)     |                |
|                          |   |  |                                  |                      | Pf  | Ad             |                                  |                      | Pf   | Ad             |                                  |                      | Pf           | Ad             |
|                          |   |  |                                  |                      | Pick feed   | Milling Amount |                                  |                      | Pick feed  | Milling Amount |                                  |                      | Pick feed    | Milling Amount |
| D0.5R                    | $\alpha \leq 15^\circ$  | 40000  | 3120                             | $\leq 0.2R$          | $\leq 0.1R$   | 35000          | 2340                             | $\leq 0.2R$          | $\leq 0.1R$  | 21000          | 1300                             | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 35000  | 2080                             | $\leq 0.2R$          | $\leq 0.1R$   | 30000          | 1430                             | $\leq 0.2R$          | $\leq 0.1R$  | 15000          | 740                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D0.75R                   | $\alpha \leq 15^\circ$  | 40000  | 3900                             | $\leq 0.2R$          | $\leq 0.1R$   | 30000          | 2470                             | $\leq 0.2R$          | $\leq 0.1R$  | 14000          | 1160                             | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 30000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 25000          | 1560                             | $\leq 0.4R$          | $\leq 0.1R$  | 10000          | 610                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D1R                      | $\alpha \leq 15^\circ$  | 35000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 25000          | 2340                             | $\leq 0.4R$          | $\leq 0.1R$  | 11000          | 1040                             | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 25000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 20000          | 1430                             | $\leq 0.4R$          | $\leq 0.1R$  | 8000           | 560                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D1.25R                   | $\alpha \leq 15^\circ$  | 33000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 22000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 9300           | 920                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 24000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 17000          | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 6500           | 480                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D1.5R                    | $\alpha \leq 15^\circ$  | 30000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 20000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 8000           | 870                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 23000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 15000          | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 5600           | 450                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D2R                      | $\alpha \leq 15^\circ$  | 25000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 17000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 6400           | 830                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 20000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 13000          | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 4500           | 440                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D2.5R                    | $\alpha \leq 15^\circ$  | 23000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 15000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 5000           | 710                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 17000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 11000          | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 3500           | 380                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D3R                      | $\alpha \leq 15^\circ$  | 20000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 13000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 4200           | 690                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 15000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 10000          | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 2900           | 350                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D4R                      | $\alpha \leq 15^\circ$  | 15000  | 3900                             | $\leq 0.4R$          | $\leq 0.1R$   | 10000          | 2210                             | $\leq 0.4R$          | $\leq 0.1R$  | 3200           | 700                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 11000  | 2210                             | $\leq 0.4R$          | $\leq 0.1R$   | 7500           | 1300                             | $\leq 0.4R$          | $\leq 0.1R$  | 2200           | 360                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D5R                      | $\alpha \leq 15^\circ$  | 12000  | 3770                             | $\leq 0.4R$          | $\leq 0.1R$   | 8000           | 2080                             | $\leq 0.4R$          | $\leq 0.1R$  | 2500           | 660                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 9000   | 2080                             | $\leq 0.4R$          | $\leq 0.1R$   | 6000           | 1170                             | $\leq 0.4R$          | $\leq 0.1R$  | 1800           | 350                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
| D6R                      | $\alpha \leq 15^\circ$  | 10000  | 3250                             | $\leq 0.4R$          | $\leq 0.1R$   | 6600           | 1820                             | $\leq 0.4R$          | $\leq 0.1R$  | 2100           | 570                              | $\leq 0.2R$          | $\leq 0.05R$ |                |
|                          | $\alpha > 15^\circ$   | 7500   | 1820                             | $\leq 0.4R$          | $\leq 0.1R$   | 5000           | 1040                             | $\leq 0.4R$          | $\leq 0.1R$  | 1500           | 300                              | $\leq 0.2R$          | $\leq 0.05R$ |                |

Depth of cut  
加工深度



## ● KTG 2 Flutes High Speed Milling Conditions 高速標準切削

| Working material<br>被切削材 | Alloy steels, Tool steels,<br>SCM,SKD61,SKD11,NAK,AISI H13,AISI D2 ect<br>合金鋼、工具鋼、預硬鋼 |                         |                                  |                      | Hardened steels,<br>SKD61,SKD11,STAVAX,AISI H13 ect<br>調質鋼 HRC45-55 |                |                                  |                      | Hardened steels,<br>SKD11,SKH,SKS,ASP23,AISI H13 ect<br>調質鋼 HRC55-60 |                |                                  |                      |           |                |
|--------------------------|---|-------------------------|----------------------------------|----------------------|---|----------------|----------------------------------|----------------------|--|----------------|----------------------------------|----------------------|-----------|----------------|
|                          | R(mm)<br>球頭半徑   | Milling<br>Conditioning | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)  |                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)   |                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度 | 切削量 (mm)  |                |
|                          |   |                         |                                  |                      | Pf  | Ad             |                                  |                      | Pf   | Ad             |                                  |                      | Pf        | Ad             |
|                          |   |                         |                                  |                      | Pick feed   | Milling Amount |                                  |                      | Pick feed  | Milling Amount |                                  |                      | Pick feed | Milling Amount |
| 0.5R                     | 粗(R)  | 40000                   | 3120                             | 0.2                  | 0.05  | 40000          | 2470                             | 0.15                 | 0.04   | 30000          | 1560                             | 0.1                  | 0.03      |                |
|                          | 精(F)  | 40000                   | 3900                             | 0.1                  | 0.05  | 40000          | 3120                             | 0.8                  | 0.04   | 30000          | 1950                             | 0.6                  | 0.03      |                |
| 1R                       | 粗(R)  | 40000                   | 6240                             | 0.2                  | 0.2   | 40000          | 4940                             | 0.2                  | 0.15   | 20000          | 2080                             | 0.15                 | 0.12      |                |
|                          | 精(F)  | 40000                   | 7800                             | 0.2                  | 0.1   | 40000          | 6240                             | 0.1                  | 0.1  | 20000          | 2600                             | 0.1                  | 0.06      |                |
| 2R                       | 粗(R)  | 30000                   | 6240                             | 0.4                  | 0.3   | 30000          | 4940                             | 0.3                  | 0.2  | 20000          | 2470                             | 0.25                 | 0.15      |                |
|                          | 精(F)  | 30000                   | 7800                             | 0.2                  | 0.15  | 30000          | 6240                             | 0.2                  | 0.1  | 20000          | 3120                             | 0.2                  | 0.1       |                |
| 3R                       | 粗(R)  | 20000                   | 5200                             | 0.6                  | 0.4   | 20000          | 4160                             | 0.5                  | 0.3  | 16000          | 2470                             | 0.3                  | 0.2       |                |
|                          | 精(F)  | 20000                   | 6500                             | 0.2                  | 0.2   | 20000          | 5200                             | 0.2                  | 0.2  | 16000          | 3120                             | 0.2                  | 0.2       |                |
| 4R                       | 粗(R)  | 16000                   | 4940                             | 1                    | 0.8   | 16000          | 3900                             | 0.8                  | 0.6  | 10000          | 1820                             | 0.7                  | 0.5       |                |
|                          | 精(F)  | 16000                   | 6240                             | 0.2                  | 0.2   | 16000          | 4940                             | 0.2                  | 0.2  | 10000          | 2340                             | 0.2                  | 0.2       |                |
| 5R                       | 粗(R)  | 12000                   | 4680                             | 2                    | 1   | 12000          | 3640                             | 1                    | 0.8  | 8000           | 1560                             | 1                    | 0.7       |                |
|                          | 精(F)  | 12000                   | 5850                             | 0.3                  | 0.3   | 12000          | 4680                             | 0.2                  | 0.2  | 8000           | 2080                             | 0.2                  | 0.2       |                |
| 6R                       | 粗(R)  | 10000                   | 3900                             | 3                    | 1.2   | 10000          | 3120                             | 1.5                  | 1.2  | 6400           | 1248                             | 1.5                  | 1         |                |
|                          | 精(F)  | 10000                   | 4870                             | 0.3                  | 0.3   | 10000          | 3900                             | 0.2                  | 0.2  | 6400           | 1560                             | 0.2                  | 0.2       |                |

Depth of cut  
加工深度

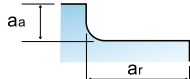


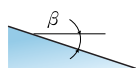
產品規格表 **P241**  
Specification page

### ● KCR 4 Flutes High Speed Milling 高速標準切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                  | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                                  | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30~38 |                                  | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38~45 |                                  | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45~55 |                                  | Hardened steels,<br>調質鋼 HRC55~60 |                                  |
|--------------------------|--|----------------------------------|---|----------------------------------|--|----------------------------------|---|----------------------------------|---|----------------------------------|----------------------------------|----------------------------------|
|                          | Mill DIA. (mm)<br>直徑   | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度                                       | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度  | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度                                     | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度   | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度  | Speed (mm <sup>3</sup> )<br>迴轉速度 |
| D2xR0.5                  | 30250  | 9970                             | 30400   | 9070                             | 30400  | 9070                             | 22800   | 6800                             | 22800   | 6130                             | 15200                            | 2710                             |
| D3xR0.75                 | 19950  | 11870                            | 19950   | 11400                            | 19950  | 11400                            | 15200   | 7980                             | 15200   | 7450                             | 9980                             | 3130                             |
| D4xR1                    | 15200  | 12350                            | 15200   | 11400                            | 15200  | 11400                            | 11400   | 8550                             | 11400   | 7790                             | 7550                             | 3370                             |
| D5xR1.2                  | 11870  | 13300                            | 11870   | 11870                            | 11870  | 11870                            | 9070  | 9070                             | 9070  | 8170                             | 6030                             | 3610                             |
| D6xR1.5                  | 10070  | 13300                            | 10070   | 12060                            | 10070  | 12060                            | 7550  | 9070                             | 7550  | 8170                             | 5030                             | 3610                             |
| D7xR1.5                  | 8650   | 11400                            | 8650  | 10350                            | 8650   | 10350                            | 6460  | 7790                             | 6460  | 6980                             | 4320                             | 3090                             |
| D8xR2                    | 7550   | 13300                            | 7550  | 12060                            | 7550   | 12060                            | 5650  | 9070                             | 5650  | 8170                             | 3800                             | 3610                             |
| D9xR2                    | 6700   | 11780                            | 6700  | 10730                            | 6700   | 10730                            | 5030  | 8075                             | 5030  | 7270                             | 3370                             | 3230                             |
| D10xR2                   | 6030   | 13300                            | 6030  | 12060                            | 6030   | 12060                            | 4510  | 9070                             | 4510  | 8170                             | 3040                             | 3610                             |
| D11xR2                   | 5510   | 12060                            | 5510  | 11020                            | 5510   | 11020                            | 4130  | 8260                             | 4130  | 7410                             | 2750                             | 3320                             |
| D12xR3                   | 5030   | 13300                            | 5030  | 12060                            | 5030   | 12060                            | 3800  | 9070                             | 3800  | 8170                             | 2520                             | 3610                             |
| D13xR3                   | 4650   | 12250                            | 4650  | 11210                            | 4650   | 11210                            | 3460  | 8360                             | 3460  | 7550                             | 2330                             | 3370                             |

Depth of cut  
加工深度





|         |      |
|---------|------|
| aa      | ar   |
| 0.1 x R | 0.3D |

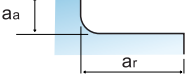
|       |         |
|-------|---------|
| aa    | ar      |
| R ≤ 2 | 0.1 x R |
| 2 < R | 0.2mm   |

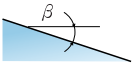
|       |          |
|-------|----------|
| aa    | ar       |
| R ≤ 2 | 0.05 x R |
| 2 < R | 0.1mm    |

### ● KCR 4 Flutes Regular Milling (Low-speed, high-feed Milling) 標準標準切削

| Working material<br>被切削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                  | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                                  | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30~38 |                                  | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼 HRC38~45 |                                  | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys steels,<br>調質鋼 HRC45~55 |                                  | Hardened steels,<br>調質鋼 HRC55~60 |                                  |
|--------------------------|--|----------------------------------|---|----------------------------------|--|----------------------------------|---|----------------------------------|---|----------------------------------|----------------------------------|----------------------------------|
|                          | Mill DIA. (mm)<br>直徑   | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度                                       | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度  | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度                                     | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度   | Speed (mm <sup>3</sup> )<br>迴轉速度 | Speed (mm <sup>3</sup> )<br>送速度  | Speed (mm <sup>3</sup> )<br>迴轉速度 |
| D2xR0.5                  | 15200  | 4990                             | 15200   | 4510                             | 11870  | 3610                             | 10450   | 3180                             | 7550  | 2040                             | 4510                             | 820                              |
| D3xR0.75                 | 9970   | 5940                             | 9970  | 5320                             | 8070   | 4270                             | 7080  | 3705                             | 5030  | 2470                             | 3040                             | 940                              |
| D4xR1                    | 7550   | 6270                             | 7550  | 5700                             | 6030   | 4560                             | 5270  | 3990                             | 3800  | 2610                             | 2280                             | 1000                             |
| D5xR1.2                  | 6030   | 6650                             | 6030  | 6030                             | 4840   | 4840                             | 4230  | 4230                             | 3040  | 2710                             | 1800                             | 1090                             |
| D6xR1.5                  | 5030   | 6650                             | 5030  | 6030                             | 4040   | 4840                             | 3510  | 4230                             | 2520  | 2710                             | 1520                             | 1090                             |
| D7xR1.5                  | 4320   | 5700                             | 4320  | 5180                             | 3470   | 4130                             | 3040  | 3610                             | 2140  | 2330                             | 1280                             | 930                              |
| D8xR2                    | 3800   | 6650                             | 3800  | 6030                             | 3040   | 4840                             | 2660  | 4230                             | 1900  | 2710                             | 1140                             | 1090                             |
| D9xR2                    | 3370   | 5890                             | 3370  | 5370                             | 2710   | 4320                             | 2370  | 3750                             | 1660  | 2420                             | 1000                             | 950                              |
| D10xR2                   | 3040   | 6650                             | 3040  | 6030                             | 2420   | 4840                             | 2140  | 4230                             | 1520  | 2710                             | 910                              | 1090                             |
| D11xR2                   | 2750   | 6030                             | 2750  | 5510                             | 2180   | 4420                             | 1950  | 3840                             | 1380  | 2470                             | 830                              | 1000                             |
| D12xR3                   | 2520   | 6650                             | 2520  | 6030                             | 2000   | 4840                             | 1760  | 4230                             | 1280  | 2710                             | 750                              | 1090                             |
| D13xR3                   | 2330   | 6130                             | 2330  | 5600                             | 1850   | 4460                             | 1610  | 3900                             | 1140  | 2520                             | 700                              | 1000                             |

Depth of cut  
加工深度





|       |         |
|-------|---------|
| aa    | ar      |
| R ≤ 2 | 0.2 x R |
| 2 < R | 0.5mm   |

|       |         |
|-------|---------|
| aa    | ar      |
| R ≤ 2 | 0.2 x R |
| 2 < R | 0.4mm   |

|       |         |
|-------|---------|
| aa    | ar      |
| R ≤ 2 | 0.1 x R |
| 2 < R | 0.2mm   |

產品規格表 **P245**  
Specification page

### ● BFR Series STANDARD Cutting Conditions 標準切削

| Working material<br>被切削材            | Carbon steels, Cast iron<br>S55c, FC250<br>碳素鋼、鑄鐵  |                                  | Alloy steels, Mold steels,<br>SCM, SKD<br>合金鋼、模具鋼 |                                  | Prehardened steels<br>HRC30-38<br>調質鋼 |                                  | Tempered steels,<br>Stainless steels<br>HRC38-45<br>調質鋼、不鏽鋼 |                                  | Hardened steels<br>HRC45-55<br>高硬度鋼 |                                  | Hardened steels<br>HRC55-60<br>高硬度鋼 |                                  |
|-------------------------------------|--|----------------------------------|---|----------------------------------|---------------------------------------|----------------------------------|---|----------------------------------|-------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
|                                     | (mm)<br>外徑xA半徑   | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                              | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                  | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度  | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                | Speed(mm <sup>-1</sup> )<br>迴轉速度 |
| BFR6x0.66                           | 5300   | 1000                             | 4800  | 780                              | 4200                                  | 600                              | 3700  | 430                              | 3200                                | 320                              | 1600                                | 120                              |
| BFR8x0.88                           | 4250   | 965                              | 3850  | 770                              | 3350                                  | 590                              | 3000  | 420                              | 2600                                | 310                              | 1300                                | 120                              |
| BFR10x0.9                           | 3200   | 930                              | 2900  | 760                              | 2500                                  | 580                              | 2200  | 410                              | 1900                                | 300                              | 1000                                | 120                              |
| BFR12x1.6                           | 2700   | 910                              | 2400  | 730                              | 2100                                  | 560                              | 1900  | 410                              | 1600                                | 300                              | 800                                 | 110                              |
| BFR12x0.91                          | 2700   | 820                              | 2400  | 660                              | 2100                                  | 500                              | 1900  | 370                              | 1600                                | 270                              | 800                                 | 100                              |
| BFR16x1.77                          | 2000   | 800                              | 1800  | 650                              | 1600                                  | 510                              | 1400  | 360                              | 1200                                | 260                              | 600                                 | 100                              |
| BFR16x1.5                           | 1600   | 700                              | 1400  | 550                              | 1300                                  | 460                              | 1100  | 310                              | 1000                                | 240                              | 480                                 | 80                               |
| Depth of cut<br>切削深度(mm)            | 0.1D   |                                  |   |                                  |                                       |                                  |   |                                  |                                     |                                  | 0.05D                               |                                  |
| Conventional<br>Condition<br>通用切削條件 | Adjust Milling condition when unusual vibration, different sound occur by cutting.<br>切削過程發生不正常聲音或不正常震動，請修正切削條件。 |                                  |   |                                  |                                       |                                  |   |                                  |                                     |                                  |                                     |                                  |

### ● BFR Series HIGH - SPEED CONDITIONS 標準切削

| Working material<br>被切削材                  | Carbon steels, Cast iron<br>S55c, FC250<br>碳素鋼、鑄鐵  |                                  | Alloy steels, Mold steels,<br>SCM, SKD<br>合金鋼、模具鋼 |                                  | Prehardened steels<br>HRC30-38<br>調質鋼 |                                  | Tempered steels,<br>Stainless steels<br>HRC38-45<br>調質鋼、不鏽鋼 |                                  | Hardened steels<br>HRC45-55<br>高硬度鋼 |                                  | Hardened steels<br>HRC55-60<br>高硬度鋼 |                                  |
|---|--|----------------------------------|---|----------------------------------|---------------------------------------|----------------------------------|---|----------------------------------|-------------------------------------|----------------------------------|-------------------------------------|----------------------------------|
|   | (mm)<br>外徑xA半徑   | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                              | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                  | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度  | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Feed(mm/min)<br>進給速度                | Speed(mm <sup>-1</sup> )<br>迴轉速度 |
| BFR6x0.66                                 | 17000  | 4100                             | 16000   | 3800                             | 13000                                 | 3100                             | 12000   | 2300                             | 12000                               | 2000                             | 8000                                | 960                              |
| BFR8x0.88                                 | 13500  | 3600                             | 13000   | 3400                             | 10500                                 | 2750                             | 9650  | 2000                             | 9500                                | 1750                             | 6400                                | 840                              |
| BFR10x0.9                                 | 10000  | 3000                             | 10000   | 3000                             | 8000                                  | 2400                             | 7300  | 1800                             | 7000                                | 1500                             | 4800                                | 720                              |
| BFR12x1.6                                 | 8500   | 2000                             | 8000  | 1900                             | 6600                                  | 1600                             | 6100  | 1200                             | 5800                                | 1000                             | 4000                                | 400                              |
| BFR12x0.91                                | 9050   | 2100                             | 8500  | 2000                             | 8000                                  | 1900                             | 6600  | 1600                             | 6100                                | 1200                             | 4400                                | 480                              |
| BFR16x1.77                                | 6400   | 1800                             | 6000  | 1700                             | 5000                                  | 1400                             | 4600  | 1100                             | 4400                                | 900                              | 3000                                | 430                              |
| BFR16x1.5                                 | 5100   | 1500                             | 4800  | 1400                             | 4000                                  | 1200                             | 3700  | 900                              | 3500                                | 700                              | 2400                                | 360                              |
| Depth of cut<br>切削深度(mm)                  | 0.05D  |                                  |   |                                  |                                       |                                  |   |                                  |                                     |                                  | 0.02D                               |                                  |
| High Speed<br>Cutting Condition<br>高速切削條件 | (1)When using low speed machines, use the maximum speed as an adjust the feed rate.<br>當使用低轉速機器，請使用最高轉速並修正進給速度。<br>(2)Adjust Milling condition when unusual vibration, different sound occur by cutting.<br>切削過程發生不正常聲音或不正常震動，請修正切削條件。 |                                  |   |                                  |                                       |                                  |   |                                  |                                     |                                  |                                     |                                  |

產品規格表 **P248**

Specification page

## ● CDM Centering 定點切削

| Work Material<br>被削材 | Mild steels, Carbon steels, Cast iron<br>SS400, S55C, FC250 (-750N/mm2)<br>一般構造鋼. 碳素鋼. 鑄鐵 |  | Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD<br>~HRC30合金鋼. 工具鋼 |                                   | Hardened steels. Prehardened steels. (Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼、預硬鋼HRC30~38 |                                   | 鑄鐵 FC250等<br>一般構造鋼. 碳素鋼.<br>~HRC30 |                                   | Aluminum alloy expanding material |                                   |
|----------------------|---|--|---|-----------------------------------|--|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
|                      | Diameter<br>直徑 (mm)   | Rotational Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)                                      | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)   | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)         | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)        | Speed<br>迴轉速 (min <sup>-1</sup> ) |
| 3                    | 5300  | 318  | 3200  | 192                               | 1600   | 72                                | 5300                               | 318                               | 8000                              | 600                               |
| 4                    | 4000  | 320  | 2400  | 180                               | 1200   | 72                                | 4000                               | 320                               | 6000                              | 600                               |
| 5                    | 3200  | 320  | 1900  | 181                               | 960  | 67                                | 3200                               | 320                               | 4800                              | 600                               |
| 6                    | 2600  | 324  | 1600  | 168                               | 800  | 68                                | 2700                               | 324                               | 4000                              | 600                               |
| 8                    | 2000  | 300  | 1200  | 156                               | 600  | 66                                | 2000                               | 300                               | 3000                              | 600                               |
| 10                   | 1600  | 288  | 960   | 134                               | 480  | 62                                | 1600                               | 288                               | 2400                              | 600                               |
| 12                   | 1300  | 260  | 800   | 124                               | 400  | 60                                | 1300                               | 260                               | 2000                              | 600                               |
| 16                   | 1000  | 240  | 600   | 114                               | 300  | 57                                | 1000                               | 240                               | 1500                              | 600                               |
| 20                   | 800   | 224  | 480   | 110                               | 240  | 55                                | 800                                | 224                               | 1200                              | 600                               |

## ● CDM Chamfering 導角、側銑切削

| Work Material<br>被削材 | Mild steels, Carbon steels, Cast iron<br>SS400, S55C, FC250 (-750N/mm2)<br>一般構造鋼. 碳素鋼. 鑄鐵 |                                   | Alloy Steels, Tool Steels, SCM, SKT, SKS, SKD<br>~HRC30合金鋼. 工具鋼 |                                   | Hardened steels. Prehardened steels. (Free-cutting)<br>SKT.SKD.NAK55.HPM1<br>調質鋼、預硬鋼HRC30~38 |                                   | 鑄鐵 FC250等<br>一般構造鋼. 碳素鋼.<br>~HRC30 |                                   | Aluminum alloy expanding material |                                   |
|----------------------|---|-----------------------------------|---|-----------------------------------|--|-----------------------------------|------------------------------------|-----------------------------------|-----------------------------------|-----------------------------------|
|                      | Diameter<br>直徑 (mm)   | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)                                      | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)   | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)         | Speed<br>迴轉速 (min <sup>-1</sup> ) | Feed Rate<br>進給速度 (mm/min)        | Speed<br>迴轉速 (min <sup>-1</sup> ) |
| 3                    | 5300  | 200                               | 3200  | 100                               | 1600   | 40                                | 5300                               | 450                               | 8000                              | 400                               |
| 4                    | 4000  | 200                               | 2400  | 100                               | 1200   | 40                                | 4000                               | 450                               | 6000                              | 400                               |
| 5                    | 3200  | 200                               | 1900  | 100                               | 960  | 40                                | 3200                               | 450                               | 4800                              | 400                               |
| 6                    | 2600  | 200                               | 1600  | 100                               | 800  | 40                                | 2700                               | 450                               | 4000                              | 400                               |
| 8                    | 2000  | 200                               | 1200  | 100                               | 600  | 40                                | 2000                               | 450                               | 3000                              | 400                               |
| 10                   | 1600  | 200                               | 960   | 100                               | 480  | 40                                | 1600                               | 450                               | 2400                              | 400                               |
| 12                   | 1300  | 200                               | 800   | 100                               | 400  | 40                                | 1300                               | 450                               | 2000                              | 400                               |
| 16                   | 1000  | 200                               | 600   | 100                               | 300  | 40                                | 1000                               | 450                               | 1500                              | 400                               |
| 20                   | 800   | 180                               | 480   | 100                               | 240  | 35                                | 800                                | 400                               | 1200                              | 360                               |

ISE

ISB

產品規格表 **P250-251**  
Specification page

產品規格表 **P252**  
Specification page

## ISE/ISB Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| Side Milling     | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |            |   |          |      | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |           |   |       |        | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |            |   |          |                  | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |           |   |     |          |  |
|------------------|---|------------|---|----------|------|---|-----------|---|-------|--------|---|------------|---|----------|------------------|---|-----------|---|-----|----------|--|
|                  | Hardness BRINELL<br>≤ 175   |            |   |          |      | ≤ 275   |           |   |       |        | ≤ 375   |            |   |          |                  | > 375<br>≤ 475  |           |   |     |          |  |
| HRC<br>≤ 6.4     |   |            |   |          | ≤ 28 |   |           |   |       | ≤ 39.8 |   |            |   |          | > 39.8<br>≤ 49.1 |   |           |   |     |          |  |
| Vc (SFM)         | 437   | (350-525)  |   |          |      | 318   | (255-382) |   |       |        | 320   | (256-384)  |   |          |                  | 166   | (133-199) |   |     |          |  |
| Ae/Ap            | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D  |            | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |          |      | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D                            |           | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |       |        | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D                |            | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |          |                  | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D                |           | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |     |          |  |
| MILL DIA. (inch) | RPM   | Feed (IPM) |   |          |      | Feed (IPM)  |           |   |       | RPM    | Fz  | Feed (IPM) |   |          |                  | RPM   | Fz        | Feed (IPM)                              |     |          |  |
|                  |   | 2 Flutes   |   | 3 Flutes |      | 2 Flutes  |           | 3 Flutes                                |       |        |   | 2 Flutes   |   | 3 Flutes |                  |   |           | 2 Flutes                                |     | 3 Flutes |  |
| 1/64             | 106,838   | 0.00003    | 6.4                                     | 9.6      | 12.8 | 77,806  | 0.00002   | 3.11                                    | 4.67  | 6.22   | 77992   | 0.00003    | 4.7                                     | 7.0      | 9.4              | 40598   | 0.00002   | 1.6                                     | 2.4 | 3.2      |  |
| 1/32             | 53,419  | 0.00006    | 6.4                                     | 9.6      | 12.8 | 38,903  | 0.00005   | 3.89                                    | 5.84  | 7.78   | 38996   | 0.00006    | 4.7                                     | 7.0      | 9.4              | 20299   | 0.00005   | 2.0                                     | 3.0 | 4.1      |  |
| 3/64             | 35,613  | 0.00010    | 7.1                                     | 10.7     | 14.2 | 25,935  | 0.00007   | 3.63                                    | 5.45  | 7.26   | 25997   | 0.00010    | 5.2                                     | 7.8      | 10.4             | 13533   | 0.00007   | 1.9                                     | 2.8 | 3.8      |  |
| 1/16             | 26,709  | 0.00013    | 6.9                                     | 10.4     | 13.9 | 19,451  | 0.00009   | 3.50                                    | 5.25  | 7.00   | 19498   | 0.00013    | 5.1                                     | 7.6      | 10.1             | 10150   | 0.00009   | 1.8                                     | 2.7 | 3.7      |  |
| 5/64             | 21,368  | 0.00018    | 7.7                                     | 11.5     | 15.4 | 15,561  | 0.00012   | 3.66                                    | 5.49  | 7.31   | 15598   | 0.00018    | 5.6                                     | 8.4      | 11.2             | 8120  | 0.00012   | 1.9                                     | 2.9 | 3.8      |  |
| 3/32             | 17,806  | 0.00023    | 8.2                                     | 12.3     | 16.4 | 12,968  | 0.00015   | 3.76                                    | 5.64  | 7.52   | 12999   | 0.00023    | 6.0                                     | 9.0      | 12.0             | 6766  | 0.00015   | 2.0                                     | 2.9 | 3.9      |  |
| 7/64             | 15,263  | 0.00027    | 8.2                                     | 12.4     | 16.5 | 11,115  | 0.00017   | 3.83                                    | 5.75  | 7.67   | 11142   | 0.00027    | 6.0                                     | 9.0      | 12.0             | 5800  | 0.00017   | 2.0                                     | 3.0 | 4.0      |  |
| 1/8              | 13,355  | 0.00030    | 8.0                                     | 12.0     | 16.0 | 9,726   | 0.00020   | 3.89                                    | 5.84  | 7.78   | 9749  | 0.00030    | 5.8                                     | 8.8      | 11.7             | 5075  | 0.00020   | 2.0                                     | 3.0 | 4.1      |  |
| 9/64             | 11,871  | 0.00036    | 8.6                                     | 12.9     | 17.2 | 8,645   | 0.00025   | 4.32                                    | 6.48  | 8.65   | 8666  | 0.00036    | 6.3                                     | 9.4      | 12.6             | 4511  | 0.00025   | 2.3                                     | 3.4 | 4.5      |  |
| 5/32             | 10,684  | 0.00043    | 9.1                                     | 13.6     | 18.2 | 7,781   | 0.00030   | 4.67                                    | 7.00  | 9.34   | 7799  | 0.00043    | 6.6                                     | 9.9      | 13.3             | 4060  | 0.00030   | 2.4                                     | 3.7 | 4.9      |  |
| 11/64            | 9,713   | 0.00049    | 9.5                                     | 14.2     | 18.9 | 7,073   | 0.00035   | 4.95                                    | 7.43  | 9.90   | 7090  | 0.00049    | 6.9                                     | 10.4     | 13.8             | 3691  | 0.00035   | 2.6                                     | 3.9 | 5.2      |  |
| 3/16             | 8,903   | 0.00055    | 9.8                                     | 14.7     | 19.6 | 6,484   | 0.00040   | 5.19                                    | 7.78  | 10.37  | 6499  | 0.00055    | 7.1                                     | 10.7     | 14.3             | 3383  | 0.00040   | 2.7                                     | 4.1 | 5.4      |  |
| 13/64            | 8,218   | 0.00061    | 10.1                                    | 15.1     | 20.1 | 5,985   | 0.00045   | 5.39                                    | 8.08  | 10.77  | 5999  | 0.00061    | 7.3                                     | 11.0     | 14.7             | 3123  | 0.00045   | 2.8                                     | 4.2 | 5.6      |  |
| 7/32             | 7,631   | 0.00068    | 10.3                                    | 15.5     | 20.6 | 5,558   | 0.00050   | 5.56                                    | 8.34  | 11.12  | 5571  | 0.00068    | 7.5                                     | 11.3     | 15.0             | 2900  | 0.00050   | 2.9                                     | 4.3 | 5.8      |  |
| 15/64            | 7,123   | 0.00074    | 10.5                                    | 15.8     | 21.0 | 5,187   | 0.00055   | 5.71                                    | 8.56  | 11.41  | 5199  | 0.00074    | 7.7                                     | 11.5     | 15.3             | 2707  | 0.00055   | 3.0                                     | 4.5 | 6.0      |  |
| 1/4              | 6,677   | 0.00080    | 10.7                                    | 16.0     | 21.4 | 4,863   | 0.00060   | 5.84                                    | 8.75  | 11.67  | 4874  | 0.00080    | 7.8                                     | 11.7     | 15.6             | 2537  | 0.00060   | 3.0                                     | 4.6 | 6.1      |  |
| 17/64            | 6,285   | 0.00089    | 11.2                                    | 16.7     | 22.3 | 4,577   | 0.00066   | 6.06                                    | 9.10  | 12.13  | 4588  | 0.00089    | 8.1                                     | 12.2     | 16.3             | 2388  | 0.00066   | 3.2                                     | 4.7 | 6.3      |  |
| 9/32             | 5,935   | 0.00098    | 11.6                                    | 17.4     | 23.1 | 4,323   | 0.00073   | 6.27                                    | 9.40  | 12.54  | 4333  | 0.00098    | 8.4                                     | 12.7     | 16.9             | 2255  | 0.00073   | 3.3                                     | 4.9 | 6.5      |  |
| 19/64            | 5,623   | 0.00106    | 11.9                                    | 17.9     | 23.9 | 4,095   | 0.00079   | 6.45                                    | 9.67  | 12.90  | 4105  | 0.00106    | 8.7                                     | 13.1     | 17.4             | 2137  | 0.00079   | 3.4                                     | 5.0 | 6.7      |  |
| 5/16             | 5,342   | 0.00115    | 12.3                                    | 18.4     | 24.6 | 3,890   | 0.00085   | 6.61                                    | 9.92  | 13.23  | 3900  | 0.00115    | 9.0                                     | 13.5     | 17.9             | 2030  | 0.00085   | 3.5                                     | 5.2 | 6.9      |  |
| 21/64            | 5,088   | 0.00124    | 12.6                                    | 18.9     | 25.2 | 3,705   | 0.00091   | 6.76                                    | 10.14 | 13.52  | 3714  | 0.00124    | 9.2                                     | 13.8     | 18.4             | 1933  | 0.00091   | 3.5                                     | 5.3 | 7.1      |  |
| 11/32            | 4,856   | 0.00133    | 12.9                                    | 19.3     | 25.7 | 3,537   | 0.00098   | 6.90                                    | 10.34 | 13.79  | 3545  | 0.00133    | 9.4                                     | 14.1     | 18.8             | 1845  | 0.00098   | 3.6                                     | 5.4 | 7.2      |  |
| 23/64            | 4,645   | 0.00141    | 13.1                                    | 19.7     | 26.2 | 3,383   | 0.00104   | 7.02                                    | 10.53 | 14.04  | 3391  | 0.00141    | 9.6                                     | 14.4     | 19.2             | 1765  | 0.00104   | 3.7                                     | 5.5 | 7.3      |  |
| 3/8              | 4,452   | 0.00150    | 13.4                                    | 20.0     | 26.7 | 3,242   | 0.00110   | 7.13                                    | 10.70 | 14.26  | 3250  | 0.00150    | 9.7                                     | 14.6     | 19.5             | 1692  | 0.00110   | 3.7                                     | 5.6 | 7.4      |  |
| 25/64            | 4,274   | 0.00156    | 13.4                                    | 20.0     | 26.7 | 3,112   | 0.00115   | 7.16                                    | 10.74 | 14.32  | 3120  | 0.00156    | 9.7                                     | 14.6     | 19.5             | 1624  | 0.00115   | 3.7                                     | 5.6 | 7.5      |  |
| 13/32            | 4,109   | 0.00163    | 13.4                                    | 20.0     | 26.7 | 2,993   | 0.00120   | 7.18                                    | 10.77 | 14.36  | 3000  | 0.00163    | 9.7                                     | 14.6     | 19.5             | 1561  | 0.00120   | 3.7                                     | 5.6 | 7.5      |  |
| 27/64            | 3,957   | 0.00169    | 13.4                                    | 20.0     | 26.7 | 2,882   | 0.00125   | 7.20                                    | 10.81 | 14.41  | 2889  | 0.00169    | 9.7                                     | 14.6     | 19.5             | 1504  | 0.00125   | 3.8                                     | 5.6 | 7.5      |  |
| 7/16             | 3,816   | 0.00175    | 13.4                                    | 20.0     | 26.7 | 2,779   | 0.00130   | 7.22                                    | 10.84 | 14.45  | 2785  | 0.00175    | 9.7                                     | 14.6     | 19.5             | 1450  | 0.00130   | 3.8                                     | 5.7 | 7.5      |  |
| 29/64            | 3,684   | 0.00181    | 13.4                                    | 20.0     | 26.7 | 2,683   | 0.00135   | 7.24                                    | 10.87 | 14.49  | 2689  | 0.00181    | 9.7                                     | 14.6     | 19.5             | 1400  | 0.00135   | 3.8                                     | 5.7 | 7.6      |  |
| 15/32            | 3,561   | 0.00188    | 13.4                                    | 20.0     | 26.7 | 2,594   | 0.00140   | 7.26                                    | 10.89 | 14.52  | 2600  | 0.00188    | 9.7                                     | 14.6     | 19.5             | 1353  | 0.00140   | 3.8                                     | 5.7 | 7.6      |  |
| 31/64            | 3,446   | 0.00194    | 13.4                                    | 20.0     | 26.7 | 2,510   | 0.00145   | 7.28                                    | 10.92 | 14.56  | 2516  | 0.00194    | 9.7                                     | 14.6     | 19.5             | 1310  | 0.00145   | 3.8                                     | 5.7 | 7.6      |  |
| 1/2              | 3,339   | 0.00200    | 13.4                                    | 20.0     | 26.7 | 2,431   | 0.00150   | 7.29                                    | 10.94 | 14.59  | 2437  | 0.00200    | 9.7                                     | 14.6     | 19.5             | 1269  | 0.00150   | 3.8                                     | 5.7 | 7.6      |  |
| 9/16             | 2,968   | 0.00210    | 12.5                                    | 18.7     | 24.9 | 2,161   | 0.00158   | 6.81                                    | 10.21 | 13.62  | 2166  | 0.00210    | 9.1                                     | 13.6     | 18.2             | 1128  | 0.00158   | 3.6                                     | 5.3 | 7.1      |  |
| 5/8              | 2,671   | 0.00220    | 11.8                                    | 17.6     | 23.5 | 1,945   | 0.00165   | 6.42                                    | 9.63  | 12.84  | 1950  | 0.00220    | 8.6                                     | 12.9     | 17.2             | 1015  | 0.00165   | 3.3                                     | 5.0 | 6.7      |  |
| 11/16            | 2,428   | 0.00230    | 11.2                                    | 16.8     | 22.3 | 1,768   | 0.00173   | 6.10                                    | 9.15  | 12.20  | 1773  | 0.00230    | 8.2                                     | 12.2     | 16.3             | 923   | 0.00173   | 3.2                                     | 4.8 | 6.4      |  |
| 3/4              | 2,226   | 0.00240    | 10.7                                    | 16.0     | 21.4 | 1,621   | 0.00180   | 5.84                                    | 8.75  | 11.67  | 1625  | 0.00240    | 7.8                                     | 11.7     | 15.6             | 846   | 0.00180   | 3.0                                     | 4.6 | 6.1      |  |
| 7/8              | 1,908   | 0.00260    | 9.9                                     | 14.9     | 19.8 | 1,389   | 0.00195   | 5.42                                    | 8.13  | 10.84  | 1393  | 0.00260    | 7.2                                     | 10.9     | 14.5             | 725   | 0.00195   | 2.8                                     | 4.2 | 5.7      |  |
| 1                | 1,669   | 0.00280    | 9.3                                     | 14.0     | 18.7 | 1,216   | 0.00210   | 5.11                                    | 7.66  | 10.21  | 1219  | 0.00280    | 6.8                                     | 10.2     | 13.6             | 634   | 0.00210   | 2.7                                     | 4.0 | 5.3      |  |

Depth of cut 切削量基準

rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

ISE


ISB

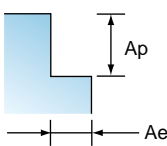
產品規格表 **P250-251**  
Specification page

產品規格表 **P252**  
Specification page

## ISE/ISB Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| Side Milling  | TOOL STEELS<br>A2, D2, H13, L2, M2, P20, S7, T15, W2 |  |            |   |          |  | CAST IRONS<br>Gray, Malleable, Ductile |   |          |  |        |   | STAINLESS STEELS<br>(Free Machining)<br>303, 416, 420F, 430F 440F |  |          |   |         |            | STAINLESS STEELS<br>(Difficult)<br>304, 304L, 316, 316L |          |  |  |  |  |
|--|--|--|------------|---|----------|--|--|---|----------|--|--------|---|---|--|----------|---|---------|------------|---|----------|--|--|--|--|
|  | Hardness<br>BRINELL<br>> 475<br>≤ 655                |  |            |   |          |  | ≤ 220                                  |   |          |  |        |   | ≤ 275   |  |          |   |         |            | ≤ 275   |          |  |  |  |  |
| HRC<br>> 50<br>≤ 65  |  |  |            |   |          | ≤ 18.8                                   |  |   |          |  |        | ≤ 28                                    |   |  |          |   |         | ≤ 28       |   |          |  |  |  |  |
| Vc (SFM)   |  | 71                                       |            | (57-85)                                 |          | 335                                      |  | (255-382)                               |          | 318                                      |        | (281-422)                               |   | 242                                      |          | (194-290)                               |         |            |   |          |  |  |  |  |
| Ae/Ap  |  | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D |            | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |          | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D |  | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |          | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D |        | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |   | Ae(2)=0.05D<br>Ae(4)=0.25D<br>Ap(3)=1.5D |          | Ae(3)=0.25D<br>Ap(2)=1.5D<br>Ap(4)=1.5D |         |            |   |          |  |  |  |  |
| MILL DIA.<br>(inch)  | RPM  | Fz                                       | Feed (IPM) |   |          | RPM                                      | Fz                                     | Feed (IPM)                              |          |  | RPM    | Fz                                      | Feed (IPM)  |  |          | RPM                                     | Fz      | Feed (IPM) |   |          |  |  |  |  |
|  |  |  | 2 Flutes   | 3 Flutes                                | 4 Flutes |  |  | 2 Flutes                                | 3 Flutes | 4 Flutes                                 |        |   | 2 Flutes  | 3 Flutes                                 | 4 Flutes |   |         | 2 Flutes   | 3 Flutes  | 4 Flutes |  |  |  |  |
| 1/64   | 17094  | 0.00001                                  | 0.3        | 0.5                                     | 0.7      | 77,806                                   | 0.00003                                | 4.7                                     | 7.0      | 9.3                                      | 85,935 | 0.00002                                 | 3.4   | 5.2                                      | 6.9      | 59,225                                  | 0.00002 | 2.4        | 3.6   | 4.7      |  |  |  |  |
| 1/32   | 8547   | 0.00003                                  | 0.4        | 0.6                                     | 0.9      | 38,903                                   | 0.00006                                | 4.7                                     | 7.0      | 9.3                                      | 42,967 | 0.00005                                 | 4.3   | 6.4                                      | 8.6      | 29,613                                  | 0.00004 | 2.4        | 3.6   | 4.7      |  |  |  |  |
| 3/64   | 5698   | 0.00004                                  | 0.4        | 0.6                                     | 0.8      | 25,935                                   | 0.00010                                | 5.2                                     | 7.8      | 10.4                                     | 28,645 | 0.00007                                 | 4.0   | 6.0                                      | 8.0      | 19,742                                  | 0.00006 | 2.4        | 3.6   | 4.7      |  |  |  |  |
| 1/16   | 4274   | 0.00005                                  | 0.4        | 0.6                                     | 0.8      | 19,451                                   | 0.00013                                | 5.1                                     | 7.6      | 10.1                                     | 21,484 | 0.00009                                 | 3.9   | 5.8                                      | 7.7      | 14,806                                  | 0.00008 | 2.4        | 3.6   | 4.7      |  |  |  |  |
| 5/64   | 3419   | 0.00006                                  | 0.4        | 0.6                                     | 0.8      | 15,561                                   | 0.00018                                | 5.6                                     | 8.4      | 11.2                                     | 17,187 | 0.00012                                 | 4.0   | 6.1                                      | 8.1      | 11,845                                  | 0.00011 | 2.6        | 3.9   | 5.2      |  |  |  |  |
| 3/32   | 2849   | 0.00007                                  | 0.4        | 0.6                                     | 0.8      | 12,968                                   | 0.00023                                | 6.0                                     | 8.9      | 11.9                                     | 14,322 | 0.00015                                 | 4.2   | 6.2                                      | 8.3      | 9,871                                   | 0.00014 | 2.8        | 4.1   | 5.5      |  |  |  |  |
| 7/64   | 2442   | 0.00009                                  | 0.4        | 0.6                                     | 0.8      | 11,115                                   | 0.00027                                | 6.0                                     | 9.0      | 12.0                                     | 12,276 | 0.00017                                 | 4.2   | 6.4                                      | 8.5      | 8,461                                   | 0.00017 | 2.9        | 4.3   | 5.8      |  |  |  |  |
| 1/8  | 2137   | 0.00010                                  | 0.4        | 0.6                                     | 0.9      | 9,726                                    | 0.00030                                | 5.8                                     | 8.8      | 11.7                                     | 10,742 | 0.00020                                 | 4.3   | 6.4                                      | 8.6      | 7,403                                   | 0.00020 | 3.0        | 4.4   | 5.9      |  |  |  |  |
| 9/64   | 1899   | 0.00013                                  | 0.5        | 0.7                                     | 0.9      | 8,645                                    | 0.00036                                | 6.3                                     | 9.4      | 12.5                                     | 9,548  | 0.00025                                 | 4.8   | 7.2                                      | 9.5      | 6,581                                   | 0.00024 | 3.1        | 4.7   | 6.3      |  |  |  |  |
| 5/32   | 1709   | 0.00015                                  | 0.5        | 0.8                                     | 1.0      | 7,781                                    | 0.00043                                | 6.6                                     | 9.9      | 13.2                                     | 8,593  | 0.00030                                 | 5.2   | 7.7                                      | 10.3     | 5,923                                   | 0.00028 | 3.3        | 4.9   | 6.5      |  |  |  |  |
| 11/64  | 1554   | 0.00018                                  | 0.5        | 0.8                                     | 1.1      | 7,073                                    | 0.00049                                | 6.9                                     | 10.3     | 13.8                                     | 7,812  | 0.00035                                 | 5.5   | 8.2                                      | 10.9     | 5,384                                   | 0.00031 | 3.4        | 5.0   | 6.7      |  |  |  |  |
| 3/16   | 1425   | 0.00020                                  | 0.6        | 0.9                                     | 1.1      | 6,484                                    | 0.00055                                | 7.1                                     | 10.7     | 14.3                                     | 7,161  | 0.00040                                 | 5.7   | 8.6                                      | 11.5     | 4,935                                   | 0.00035 | 3.5        | 5.2   | 6.9      |  |  |  |  |
| 13/64  | 1315   | 0.00023                                  | 0.6        | 0.9                                     | 1.2      | 5,985                                    | 0.00061                                | 7.3                                     | 11.0     | 14.7                                     | 6,610  | 0.00045                                 | 5.9   | 8.9                                      | 11.9     | 4,556                                   | 0.00039 | 3.5        | 5.3   | 7.1      |  |  |  |  |
| 7/32   | 1221   | 0.00025                                  | 0.6        | 0.9                                     | 1.2      | 5,558                                    | 0.00068                                | 7.5                                     | 11.3     | 15.0                                     | 6,138  | 0.00050                                 | 6.1   | 9.2                                      | 12.3     | 4,230                                   | 0.00043 | 3.6        | 5.4   | 7.2      |  |  |  |  |
| 15/64  | 1140   | 0.00028                                  | 0.6        | 0.9                                     | 1.3      | 5,187                                    | 0.00074                                | 7.7                                     | 11.5     | 15.3                                     | 5,729  | 0.00055                                 | 6.3   | 9.5                                      | 12.6     | 3,948                                   | 0.00046 | 3.7        | 5.5   | 7.3      |  |  |  |  |
| 1/4  | 1068   | 0.00030                                  | 0.6        | 1.0                                     | 1.3      | 4,863                                    | 0.00080                                | 7.8                                     | 11.7     | 15.6                                     | 5,371  | 0.00060                                 | 6.4   | 9.7                                      | 12.9     | 3,702                                   | 0.00050 | 3.7        | 5.6   | 7.4      |  |  |  |  |
| 17/64  | 1006   | 0.00033                                  | 0.7        | 1.0                                     | 1.3      | 4,577                                    | 0.00089                                | 8.1                                     | 12.2     | 16.2                                     | 5,055  | 0.00066                                 | 6.7   | 10.0                                     | 13.4     | 3,484                                   | 0.00055 | 3.8        | 5.7   | 7.7      |  |  |  |  |
| 9/32   | 950  | 0.00036                                  | 0.7        | 1.0                                     | 1.4      | 4,323                                    | 0.00098                                | 8.4                                     | 12.6     | 16.9                                     | 4,774  | 0.00073                                 | 6.9   | 10.4                                     | 13.8     | 3,290                                   | 0.00060 | 3.9        | 5.9   | 7.9      |  |  |  |  |
| 19/64  | 900  | 0.00039                                  | 0.7        | 1.1                                     | 1.4      | 4,095                                    | 0.00106                                | 8.7                                     | 13.1     | 17.4                                     | 4,523  | 0.00079                                 | 7.1   | 10.7                                     | 14.2     | 3,117                                   | 0.00065 | 4.1        | 6.1   | 8.1      |  |  |  |  |
| 5/16   | 855  | 0.00043                                  | 0.7        | 1.1                                     | 1.5      | 3,890                                    | 0.00115                                | 8.9                                     | 13.4     | 17.9                                     | 4,297  | 0.00085                                 | 7.3   | 11.0                                     | 14.6     | 2,961                                   | 0.00070 | 4.1        | 6.2   | 8.3      |  |  |  |  |
| 21/64  | 814  | 0.00046                                  | 0.7        | 1.1                                     | 1.5      | 3,705                                    | 0.00124                                | 9.2                                     | 13.8     | 18.3                                     | 4,092  | 0.00091                                 | 7.5   | 11.2                                     | 14.9     | 2,820                                   | 0.00075 | 4.2        | 6.3   | 8.5      |  |  |  |  |
| 11/32  | 777  | 0.00049                                  | 0.8        | 1.1                                     | 1.5      | 3,537                                    | 0.00133                                | 9.4                                     | 14.1     | 18.7                                     | 3,906  | 0.00098                                 | 7.6   | 11.4                                     | 15.2     | 2,692                                   | 0.00080 | 4.3        | 6.5   | 8.6      |  |  |  |  |
| 23/64  | 743  | 0.00052                                  | 0.8        | 1.2                                     | 1.5      | 3,383                                    | 0.00141                                | 9.6                                     | 14.3     | 19.1                                     | 3,736  | 0.00104                                 | 7.8   | 11.6                                     | 15.5     | 2,575                                   | 0.00085 | 4.4        | 6.6   | 8.8      |  |  |  |  |
| 3/8  | 712  | 0.00055                                  | 0.8        | 1.2                                     | 1.6      | 3,242                                    | 0.00150                                | 9.7                                     | 14.6     | 19.5                                     | 3,581  | 0.00110                                 | 7.9   | 11.8                                     | 15.8     | 2,468                                   | 0.00090 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 25/64  | 684  | 0.00058                                  | 0.8        | 1.2                                     | 1.6      | 3,112                                    | 0.00156                                | 9.7                                     | 14.6     | 19.5                                     | 3,437  | 0.00115                                 | 7.9   | 11.9                                     | 15.8     | 2,369                                   | 0.00094 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 13/32  | 657  | 0.00060                                  | 0.8        | 1.2                                     | 1.6      | 2,993                                    | 0.00163                                | 9.7                                     | 14.6     | 19.5                                     | 3,305  | 0.00120                                 | 7.9   | 11.9                                     | 15.9     | 2,278                                   | 0.00098 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 27/64  | 633  | 0.00063                                  | 0.8        | 1.2                                     | 1.6      | 2,882                                    | 0.00169                                | 9.7                                     | 14.6     | 19.5                                     | 3,183  | 0.00125                                 | 8.0   | 11.9                                     | 15.9     | 2,194                                   | 0.00101 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 7/16   | 611  | 0.00065                                  | 0.8        | 1.2                                     | 1.6      | 2,779                                    | 0.00175                                | 9.7                                     | 14.6     | 19.5                                     | 3,069  | 0.00130                                 | 8.0   | 12.0                                     | 16.0     | 2,115                                   | 0.00105 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 29/64  | 589  | 0.00068                                  | 0.8        | 1.2                                     | 1.6      | 2,683                                    | 0.00181                                | 9.7                                     | 14.6     | 19.5                                     | 2,963  | 0.00135                                 | 8.0   | 12.0                                     | 16.0     | 2,042                                   | 0.00109 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 15/32  | 570  | 0.00070                                  | 0.8        | 1.2                                     | 1.6      | 2,594                                    | 0.00188                                | 9.7                                     | 14.6     | 19.5                                     | 2,864  | 0.00140                                 | 8.0   | 12.0                                     | 16.0     | 1,974                                   | 0.00125 | 4.9        | 7.4   | 9.9      |  |  |  |  |
| 31/64  | 551  | 0.00073                                  | 0.8        | 1.2                                     | 1.6      | 2,510                                    | 0.00194                                | 9.7                                     | 14.6     | 19.5                                     | 2,772  | 0.00145                                 | 8.0   | 12.1                                     | 16.1     | 1,910                                   | 0.00116 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 1/2  | 534  | 0.00075                                  | 0.8        | 1.2                                     | 1.6      | 2,431                                    | 0.00200                                | 9.7                                     | 14.6     | 19.5                                     | 2,685  | 0.00150                                 | 8.1   | 12.1                                     | 16.1     | 1,851                                   | 0.00120 | 4.4        | 6.7   | 8.9      |  |  |  |  |
| 9/16   | 475  | 0.00079                                  | 0.7        | 1.1                                     | 1.5      | 2,161                                    | 0.00210                                | 9.1                                     | 13.6     | 18.2                                     | 2,387  | 0.00158                                 | 7.5   | 11.3                                     | 15.0     | 1,645                                   | 0.00125 | 4.1        | 6.2   | 8.2      |  |  |  |  |
| 5/8  | 427  | 0.00083                                  | 0.7        | 1.1                                     | 1.4      | 1,945                                    | 0.00220                                | 8.6                                     | 12.8     | 17.1                                     | 2,148  | 0.00165                                 | 7.1   | 10.6                                     | 14.2     | 1,481                                   | 0.00130 | 3.8        | 5.8   | 7.7      |  |  |  |  |
| 11/16  | 389  | 0.00086                                  | 0.7        | 1.0                                     | 1.3      | 1,768                                    | 0.00230                                | 8.1                                     | 12.2     | 16.3                                     | 1,953  | 0.00173                                 | 6.7   | 10.1                                     | 13.5     | 1,346                                   | 0.00135 | 3.6        | 5.5   | 7.3      |  |  |  |  |
| 3/4  | 356  | 0.00090                                  | 0.6        | 1.0                                     | 1.3      | 1,621                                    | 0.00240                                | 7.8                                     | 11.7     | 15.6                                     | 1,790  | 0.00180                                 | 6.4   | 9.7                                      | 12.9     | 1,234                                   | 0.00140 | 3.5        | 5.2   | 6.9      |  |  |  |  |
| 7/8  | 305  | 0.00098                                  | 0.6        | 0.9                                     | 1.2      | 1,389                                    | 0.00260                                | 7.2                                     | 10.8     | 14.4                                     | 1,535  | 0.00195                                 | 6.0   | 9.0                                      | 12.0     | 1,058                                   | 0.00155 | 3.3        | 4.9   | 6.6      |  |  |  |  |
| 1  | 267  | 0.00105                                  | 0.6        | 0.8                                     | 1.1      | 1,216                                    | 0.00280                                | 6.8                                     | 10.2     | 13.6                                     | 1,343  | 0.00210                                 | 5.6   | 8.5                                      | 11.3     | 925                                     | 0.00170 | 3.1        | 4.7   | 6.3      |  |  |  |  |



Depth of cut  
切削量基準

rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

Unit/單位: mm

ISE

ISB

產品規格表 **P250-251**


產品規格表 **P252**

Specification page

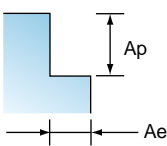
Specification page

## ISE/ISB Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| Side Milling  | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, 718, Incoloy 800, Monel 400, Rene, Waspalloy |         |                           |          |                           | TITANIUM ALLOYS<br>Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti52 Cr3Sn3Al |           |                           |          |                           | GRAPHITE                  |           |                           |          |                           |
|--|---|---------|---------------------------|----------|---------------------------|---|-----------|---------------------------|----------|---------------------------|---------------------------|-----------|---------------------------|----------|---------------------------|
|  | ≤ 300   |         |                           |          |                           | ≤ 350   |           |                           |          |                           |                           |           |                           |          |                           |
| Hardness BRINELL   | ≤ 32  |         |                           |          |                           | ≤ 37.9  |           |                           |          |                           |                           |           |                           |          |                           |
| HRC  | ≤ 32  |         |                           |          |                           | ≤ 37.9  |           |                           |          |                           |                           |           |                           |          |                           |
| Vc (SFM)   | 62  | (49-74) |                           |          |                           | 170   | (137-205) |                           |          |                           | 627                       | (502-752) |                           |          |                           |
| Ae/Ap  | Ae(2)=0.05D<br>Ap(2)=1.5D   |         | Ae(3)=0.25D<br>Ap(3)=1.5D |          | Ae(4)=0.25D<br>Ap(4)=1.5D | Ae(2)=0.05D<br>Ap(2)=1.5D   |           | Ae(3)=0.25D<br>Ap(3)=1.5D |          | Ae(4)=0.25D<br>Ap(4)=1.5D | Ae(2)=0.05D<br>Ap(2)=1.5D |           | Ae(3)=0.25D<br>Ap(3)=1.5D |          | Ae(4)=0.25D<br>Ap(4)=1.5D |
| MILL DIA. (inch)   | RPM   | Fz      | Feed (IPM)                |          |                           | RPM   | Fz        | Feed (IPM)                |          |                           | RPM                       | Fz        | Feed (IPM)                |          |                           |
|  |   |         | 2 Flutes                  | 3 Flutes | 4 Flutes                  |   |           | 2 Flutes                  | 3 Flutes | 4 Flutes                  |                           |           | 2 Flutes                  | 3 Flutes | 4 Flutes                  |
| 1/64   | 15,097  | 0.00002 | 0.6                       | 0.9      | 1.2                       | 41,806  | 0.00002   | 1.7                       | 2.5      | 3.3                       | 153,289                   | 0.00006   | 18.4                      | 27.6     | 36.8                      |
| 1/32   | 7,548   | 0.00003 | 0.5                       | 0.7      | 0.9                       | 20,903  | 0.00004   | 1.7                       | 2.5      | 3.3                       | 76,644                    | 0.00012   | 18.4                      | 27.6     | 36.8                      |
| 3/64   | 5,032   | 0.00005 | 0.5                       | 0.7      | 0.9                       | 13,935  | 0.00006   | 1.7                       | 2.5      | 3.3                       | 51,096                    | 0.00020   | 20.4                      | 30.7     | 40.9                      |
| 1/16   | 3,774   | 0.00006 | 0.5                       | 0.7      | 0.9                       | 10,452  | 0.00008   | 1.7                       | 2.5      | 3.3                       | 38,322                    | 0.00026   | 19.9                      | 29.9     | 39.9                      |
| 5/64   | 3,019   | 0.00010 | 0.6                       | 0.9      | 1.1                       | 8,361   | 0.00011   | 1.8                       | 2.8      | 3.7                       | 30,658                    | 0.00036   | 22.1                      | 33.1     | 44.1                      |
| 3/32   | 2,516   | 0.00013 | 0.7                       | 1.0      | 1.3                       | 6,968   | 0.00014   | 2.0                       | 2.9      | 3.9                       | 25,548                    | 0.00046   | 23.5                      | 35.3     | 47.0                      |
| 7/64   | 2,157   | 0.00017 | 0.7                       | 1.1      | 1.4                       | 5,972   | 0.00017   | 2.0                       | 3.0      | 4.1                       | 21,898                    | 0.00054   | 23.7                      | 35.5     | 47.3                      |
| 1/8  | 1,887   | 0.00020 | 0.8                       | 1.1      | 1.5                       | 5,226   | 0.00020   | 2.1                       | 3.1      | 4.2                       | 19,161                    | 0.00060   | 23.0                      | 34.5     | 46.0                      |
| 9/64   | 1,677   | 0.00023 | 0.8                       | 1.1      | 1.5                       | 4,645   | 0.00024   | 2.2                       | 3.3      | 4.4                       | 17,032                    | 0.00073   | 24.7                      | 37.0     | 49.4                      |
| 5/32   | 1,510   | 0.00025 | 0.8                       | 1.1      | 1.5                       | 4,181   | 0.00028   | 2.3                       | 3.4      | 4.6                       | 15,329                    | 0.00085   | 26.1                      | 39.1     | 52.1                      |
| 11/64  | 1,372   | 0.00028 | 0.8                       | 1.1      | 1.5                       | 3,801   | 0.00031   | 2.4                       | 3.6      | 4.8                       | 13,935                    | 0.00098   | 27.2                      | 40.8     | 54.3                      |
| 3/16   | 1,258   | 0.00030 | 0.8                       | 1.1      | 1.5                       | 3,484   | 0.00035   | 2.4                       | 3.7      | 4.9                       | 12,774                    | 0.00110   | 28.1                      | 42.2     | 56.2                      |
| 13/64  | 1,161   | 0.00033 | 0.8                       | 1.1      | 1.5                       | 3,216   | 0.00039   | 2.5                       | 3.7      | 5.0                       | 11,791                    | 0.00123   | 28.9                      | 43.3     | 57.8                      |
| 7/32   | 1,078   | 0.00035 | 0.8                       | 1.1      | 1.5                       | 2,986   | 0.00043   | 2.5                       | 3.8      | 5.1                       | 10,949                    | 0.00135   | 29.6                      | 44.3     | 59.1                      |
| 15/64  | 1,006   | 0.00038 | 0.8                       | 1.1      | 1.5                       | 2,787   | 0.00046   | 2.6                       | 3.9      | 5.2                       | 10,219                    | 0.00148   | 30.1                      | 45.2     | 60.3                      |
| 1/4  | 944   | 0.00040 | 0.8                       | 1.1      | 1.5                       | 2,613   | 0.00050   | 2.6                       | 3.9      | 5.2                       | 9,581                     | 0.00160   | 30.7                      | 46.0     | 61.3                      |
| 17/64  | 888   | 0.00045 | 0.8                       | 1.2      | 1.6                       | 2,459   | 0.00055   | 2.7                       | 4.1      | 5.4                       | 9,017                     | 0.00178   | 32.0                      | 48.0     | 64.0                      |
| 9/32   | 839   | 0.00050 | 0.8                       | 1.3      | 1.7                       | 2,323   | 0.00060   | 2.8                       | 4.2      | 5.6                       | 8,516                     | 0.00195   | 33.2                      | 49.8     | 66.4                      |
| 19/64  | 795   | 0.00055 | 0.9                       | 1.3      | 1.7                       | 2,200   | 0.00065   | 2.9                       | 4.3      | 5.7                       | 8,068                     | 0.00213   | 34.3                      | 51.4     | 68.6                      |
| 5/16   | 755   | 0.00060 | 0.9                       | 1.4      | 1.8                       | 2,090   | 0.00070   | 2.9                       | 4.4      | 5.9                       | 7,664                     | 0.00230   | 35.3                      | 52.9     | 70.5                      |
| 21/64  | 719   | 0.00065 | 0.9                       | 1.4      | 1.9                       | 1,991   | 0.00075   | 3.0                       | 4.5      | 6.0                       | 7,299                     | 0.00248   | 36.1                      | 54.2     | 72.3                      |
| 11/32  | 686   | 0.00070 | 1.0                       | 1.4      | 1.9                       | 1,900   | 0.00080   | 3.0                       | 4.6      | 6.1                       | 6,968                     | 0.00265   | 36.9                      | 55.4     | 73.9                      |
| 23/64  | 656   | 0.00075 | 1.0                       | 1.5      | 2.0                       | 1,818   | 0.00085   | 3.1                       | 4.6      | 6.2                       | 6,665                     | 0.00283   | 37.7                      | 56.5     | 75.3                      |
| 3/8  | 629   | 0.00080 | 1.0                       | 1.5      | 2.0                       | 1,742   | 0.00090   | 3.1                       | 4.7      | 6.3                       | 6,387                     | 0.00300   | 38.3                      | 57.5     | 76.6                      |
| 25/64  | 604   | 0.00083 | 1.0                       | 1.5      | 2.0                       | 1,672   | 0.00094   | 3.1                       | 4.7      | 6.3                       | 6,132                     | 0.00313   | 38.3                      | 57.5     | 76.6                      |
| 13/32  | 581   | 0.00085 | 1.0                       | 1.5      | 2.0                       | 1,608   | 0.00098   | 3.1                       | 4.7      | 6.3                       | 5,896                     | 0.00325   | 38.3                      | 57.5     | 76.6                      |
| 27/64  | 559   | 0.00088 | 1.0                       | 1.5      | 2.0                       | 1,548   | 0.00101   | 3.1                       | 4.7      | 6.3                       | 5,677                     | 0.00338   | 38.3                      | 57.5     | 76.6                      |
| 7/16   | 539   | 0.00090 | 1.0                       | 1.5      | 1.9                       | 1,493   | 0.00105   | 3.1                       | 4.7      | 6.3                       | 5,475                     | 0.00350   | 38.3                      | 57.5     | 76.6                      |
| 29/64  | 521   | 0.00093 | 1.0                       | 1.4      | 1.9                       | 1,442   | 0.00109   | 3.1                       | 4.7      | 6.3                       | 5,286                     | 0.00363   | 38.3                      | 57.5     | 76.6                      |
| 15/32  | 503   | 0.00095 | 1.0                       | 1.4      | 1.9                       | 1,394   | 0.00125   | 3.5                       | 5.2      | 7.0                       | 5,110                     | 0.00375   | 38.3                      | 57.5     | 76.6                      |
| 31/64  | 487   | 0.00098 | 0.9                       | 1.4      | 1.9                       | 1,349   | 0.00116   | 3.1                       | 4.7      | 6.3                       | 4,945                     | 0.00388   | 38.3                      | 57.5     | 76.6                      |
| 1/2  | 472   | 0.00100 | 0.9                       | 1.4      | 1.9                       | 1,306   | 0.00120   | 3.1                       | 4.7      | 6.3                       | 4,790                     | 0.00400   | 38.3                      | 57.5     | 76.6                      |
| 9/16   | 419   | 0.00105 | 0.9                       | 1.3      | 1.8                       | 1,161   | 0.00125   | 2.9                       | 4.4      | 5.8                       | 4,258                     | 0.00420   | 35.8                      | 53.7     | 71.5                      |
| 5/8  | 377   | 0.00110 | 0.8                       | 1.2      | 1.7                       | 1,045   | 0.00130   | 2.7                       | 4.1      | 5.4                       | 3,832                     | 0.00440   | 33.7                      | 50.6     | 67.4                      |
| 11/16  | 343   | 0.00115 | 0.8                       | 1.2      | 1.6                       | 950   | 0.00135   | 2.6                       | 3.8      | 5.1                       | 3,484                     | 0.00460   | 32.1                      | 48.1     | 64.1                      |
| 3/4  | 315   | 0.00120 | 0.8                       | 1.1      | 1.5                       | 871   | 0.00140   | 2.4                       | 3.7      | 4.9                       | 3,194                     | 0.00480   | 30.7                      | 46.0     | 61.3                      |
| 7/8  | 270   | 0.00155 | 0.8                       | 1.3      | 1.7                       | 747   | 0.00155   | 2.3                       | 3.5      | 4.6                       | 2,737                     | 0.00520   | 28.5                      | 42.7     | 56.9                      |
| 1  | 236   | 0.00140 | 0.7                       | 1.0      | 1.3                       | 653   | 0.00170   | 2.2                       | 3.3      | 4.4                       | 2,395                     | 0.00560   | 26.8                      | 40.2     | 53.7                      |

Depth of cut  
切削量基準



rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

ISE


ISB

產品規格表 **P250-251**  
Specification page

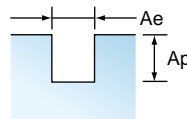
產品規格表 **P252**  
Specification page

## ISE/ISB Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling<br> | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |         |   |      |      | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |         |   |      |        | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |   |      |                  | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |   |     |     |
|---|---|---------|---|------|------|---|---------|---|------|--------|---|---------|---|------|------------------|---|---------|---|-----|-----|
|   | Hardness<br>BRINELL<br>≤ 175  |         |   |      |      | ≤ 275   |         |   |      |        | ≤ 375   |         |   |      |                  | ≥ 375<br>≤ 475  |         |   |     |     |
| HRC<br>≤ 6.4  |   |         |   |      | ≤ 28 |   |         |   |      | ≤ 39.8 |   |         |   |      | ≥ 39.8<br>≤ 49.1 |   |         |   |     |     |
| Vc<br>(SFM)   | 350   |         | (278-418)                                   |      |      | 255   |         | (203-306)                                   |      |        | 256   |         | (205-307)                                   |      |                  | 133   |         | (106-159)                                   |     |     |
| Ae/Ap   | Ae(2)=1D<br>Ae(4)=1D<br>Ap(3)=0.5D  |         | Ae(3)=1D<br>Ap(2)=1D<br>Ap(4)=0.4D          |      |      | Ae(2)=1D<br>Ae(4)=1D<br>Ap(3)=0.5D                                  |         | Ae(3)=1D<br>Ap(2)=1D<br>Ap(4)=0.4D          |      |        | Ae(2)=1D<br>Ae(4)=1D<br>Ap(3)=0.5D                      |         | Ae(3)=1D<br>Ap(2)=1D<br>Ap(4)=0.4D          |      |                  | Ae(2)=1D<br>Ae(4)=1D<br>Ap(3)=0.5D                      |         | Ae(3)=1D<br>Ap(2)=1D<br>Ap(4)=0.4D          |     |     |
| MILL DIA.<br>(inch)   | RPM   | Fz      | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |      |      | RPM   | Fz      | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |      |        | RPM   | Fz      | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |      |                  | RPM   | Fz      | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |     |     |
| 1/64  | 85,470  | 0.00003 | 5.1   | 7.7  | 10.3 | 62,245  | 0.00002 | 2.49  | 3.73 | 4.98   | 62,393  | 0.00003 | 3.7   | 5.6  | 7.5              | 32,479  | 0.00002 | 1.3   | 1.9 | 2.6 |
| 1/32  | 42,735  | 0.00006 | 5.1   | 7.7  | 10.3 | 31,122  | 0.00005 | 3.11  | 4.67 | 6.22   | 31,197  | 0.00006 | 3.7   | 5.6  | 7.5              | 16,239  | 0.00005 | 1.6   | 2.4 | 3.2 |
| 3/64  | 28,490  | 0.00010 | 5.7   | 8.5  | 11.4 | 20,748  | 0.00007 | 2.90  | 4.36 | 5.81   | 20,798  | 0.00010 | 4.2   | 6.2  | 8.3              | 10,826  | 0.00007 | 1.5   | 2.3 | 3.0 |
| 1/16  | 21,368  | 0.00013 | 5.6   | 8.3  | 11.1 | 15,561  | 0.00009 | 2.80  | 4.20 | 5.60   | 15,598  | 0.00013 | 4.1   | 6.1  | 8.1              | 8,120   | 0.00009 | 1.5   | 2.2 | 2.9 |
| 5/64  | 17,094  | 0.00018 | 6.2   | 9.2  | 12.3 | 12,449  | 0.00012 | 2.93  | 4.39 | 5.85   | 12,479  | 0.00018 | 4.5   | 6.7  | 9.0              | 6,496   | 0.00012 | 1.5   | 2.3 | 3.1 |
| 3/32  | 14,245  | 0.00023 | 6.6   | 9.8  | 13.1 | 10,374  | 0.00015 | 3.01  | 4.51 | 6.02   | 10,399  | 0.00023 | 4.8   | 7.2  | 9.6              | 5,413   | 0.00015 | 1.6   | 2.4 | 3.1 |
| 7/64  | 12,210  | 0.00027 | 6.6   | 9.9  | 13.2 | 8,892   | 0.00017 | 3.07  | 4.60 | 6.14   | 8,913   | 0.00027 | 4.8   | 7.2  | 9.6              | 4,640   | 0.00017 | 1.6   | 2.4 | 3.2 |
| 1/8   | 10,684  | 0.00030 | 6.4   | 9.6  | 12.8 | 7,781   | 0.00020 | 3.11  | 4.67 | 6.22   | 7,799   | 0.00030 | 4.7   | 7.0  | 9.4              | 4,060   | 0.00020 | 1.6   | 2.4 | 3.2 |
| 9/64  | 9,497   | 0.00036 | 6.9   | 10.3 | 13.8 | 6,916   | 0.00025 | 3.46  | 5.19 | 6.92   | 6,933   | 0.00036 | 5.0   | 7.5  | 10.1             | 3,609   | 0.00025 | 1.8   | 2.7 | 3.6 |
| 5/32  | 8,547   | 0.00043 | 7.3   | 10.9 | 14.5 | 6,224   | 0.00030 | 3.73  | 5.60 | 7.47   | 6,239   | 0.00043 | 5.3   | 8.0  | 10.6             | 3,248   | 0.00030 | 1.9   | 2.9 | 3.9 |
| 11/64   | 7,770   | 0.00049 | 7.6   | 11.4 | 15.2 | 5,659   | 0.00035 | 3.96  | 5.94 | 7.92   | 5,672   | 0.00049 | 5.5   | 8.3  | 11.1             | 2,953   | 0.00035 | 2.1   | 3.1 | 4.1 |
| 3/16  | 7,123   | 0.00055 | 7.8   | 11.8 | 15.7 | 5,187   | 0.00040 | 4.15  | 6.22 | 8.30   | 5,199   | 0.00055 | 5.7   | 8.6  | 11.4             | 2,707   | 0.00040 | 2.2   | 3.2 | 4.3 |
| 13/64   | 6,575   | 0.00061 | 8.1   | 12.1 | 16.1 | 4,788   | 0.00045 | 4.31  | 6.46 | 8.62   | 4,799   | 0.00061 | 5.9   | 8.8  | 11.8             | 2,498   | 0.00045 | 2.2   | 3.4 | 4.5 |
| 7/32  | 6,105   | 0.00068 | 8.2   | 12.4 | 16.5 | 4,446   | 0.00050 | 4.45  | 6.67 | 8.89   | 4,457   | 0.00068 | 6.0   | 9.0  | 12.0             | 2,320   | 0.00050 | 2.3   | 3.5 | 4.6 |
| 15/64   | 5,698   | 0.00074 | 8.4   | 12.6 | 16.8 | 4,150   | 0.00055 | 4.56  | 6.85 | 9.13   | 4,160   | 0.00074 | 6.1   | 9.2  | 12.3             | 2,165   | 0.00055 | 2.4   | 3.6 | 4.8 |
| 1/4   | 5,342   | 0.00080 | 8.5   | 12.8 | 17.1 | 3,890   | 0.00060 | 4.67  | 7.00 | 9.34   | 3,900   | 0.00080 | 6.2   | 9.4  | 12.5             | 2,030   | 0.00060 | 2.4   | 3.7 | 4.9 |
| 17/64   | 5,028   | 0.00089 | 8.9   | 13.4 | 17.8 | 3,661   | 0.00066 | 4.85  | 7.28 | 9.70   | 3,670   | 0.00089 | 6.5   | 9.8  | 13.0             | 1,911   | 0.00066 | 2.5   | 3.8 | 5.1 |
| 9/32  | 4,748   | 0.00098 | 9.3   | 13.9 | 18.5 | 3,458   | 0.00073 | 5.01  | 7.52 | 10.03  | 3,466   | 0.00098 | 6.8   | 10.1 | 13.5             | 1,804   | 0.00073 | 2.6   | 3.9 | 5.2 |
| 19/64   | 4,498   | 0.00106 | 9.6   | 14.3 | 19.1 | 3,276   | 0.00079 | 5.16  | 7.74 | 10.32  | 3,284   | 0.00106 | 7.0   | 10.5 | 14.0             | 1,709   | 0.00079 | 2.7   | 4.0 | 5.4 |
| 5/16  | 4,274   | 0.00115 | 9.8   | 14.7 | 19.7 | 3,112   | 0.00085 | 5.29  | 7.94 | 10.58  | 3,120   | 0.00115 | 7.2   | 10.8 | 14.4             | 1,624   | 0.00085 | 2.8   | 4.1 | 5.5 |
| 21/64   | 4,070   | 0.00124 | 10.1  | 15.1 | 20.1 | 2,964   | 0.00091 | 5.41  | 8.11 | 10.82  | 2,971   | 0.00124 | 7.4   | 11.0 | 14.7             | 1,547   | 0.00091 | 2.8   | 4.2 | 5.6 |
| 11/32   | 3,885   | 0.00133 | 10.3  | 15.4 | 20.6 | 2,829   | 0.00098 | 5.52  | 8.28 | 11.03  | 2,836   | 0.00133 | 7.5   | 11.3 | 15.0             | 1,476   | 0.00098 | 2.9   | 4.3 | 5.8 |
| 23/64   | 3,716   | 0.00141 | 10.5  | 15.7 | 21.0 | 2,706   | 0.00104 | 5.62  | 8.42 | 11.23  | 2,713   | 0.00141 | 7.7   | 11.5 | 15.3             | 1,412   | 0.00104 | 2.9   | 4.4 | 5.9 |
| 3/8   | 3,561   | 0.00150 | 10.7  | 16.0 | 21.4 | 2,594   | 0.00110 | 5.71  | 8.56 | 11.41  | 2,600   | 0.00150 | 7.8   | 11.7 | 15.6             | 1,353   | 0.00110 | 3.0   | 4.5 | 6.0 |
| 25/64   | 3,419   | 0.00156 | 10.7  | 16.0 | 21.4 | 2,490   | 0.00115 | 5.73  | 8.59 | 11.45  | 2,496   | 0.00156 | 7.8   | 11.7 | 15.6             | 1,299   | 0.00115 | 3.0   | 4.5 | 6.0 |
| 13/32   | 3,287   | 0.00163 | 10.7  | 16.0 | 21.4 | 2,394   | 0.00120 | 5.75  | 8.62 | 11.49  | 2,400   | 0.00163 | 7.8   | 11.7 | 15.6             | 1,249   | 0.00120 | 3.0   | 4.5 | 6.0 |
| 27/64   | 3,166   | 0.00169 | 10.7  | 16.0 | 21.4 | 2,305   | 0.00125 | 5.76  | 8.65 | 11.53  | 2,311   | 0.00169 | 7.8   | 11.7 | 15.6             | 1,203   | 0.00125 | 3.0   | 4.5 | 6.0 |
| 7/16  | 3,053   | 0.00175 | 10.7  | 16.0 | 21.4 | 2,223   | 0.00130 | 5.78  | 8.67 | 11.56  | 2,228   | 0.00175 | 7.8   | 11.7 | 15.6             | 1,160   | 0.00130 | 3.0   | 4.5 | 6.0 |
| 29/64   | 2,947   | 0.00181 | 10.7  | 16.0 | 21.4 | 2,146   | 0.00135 | 5.80  | 8.69 | 11.59  | 2,151   | 0.00181 | 7.8   | 11.7 | 15.6             | 1,120   | 0.00135 | 3.0   | 4.5 | 6.0 |
| 15/32   | 2,849   | 0.00188 | 10.7  | 16.0 | 21.4 | 2,075   | 0.00140 | 5.81  | 8.71 | 11.62  | 2,080   | 0.00188 | 7.8   | 11.7 | 15.6             | 1,083   | 0.00140 | 3.0   | 4.5 | 6.1 |
| 31/64   | 2,757   | 0.00194 | 10.7  | 16.0 | 21.4 | 2,008   | 0.00145 | 5.82  | 8.73 | 11.65  | 2,013   | 0.00194 | 7.8   | 11.7 | 15.6             | 1,048   | 0.00145 | 3.0   | 4.6 | 6.1 |
| 1/2   | 2,671   | 0.00200 | 10.7  | 16.0 | 21.4 | 1,945   | 0.00150 | 5.84  | 8.75 | 11.67  | 1,950   | 0.00200 | 7.8   | 11.7 | 15.6             | 1,015   | 0.00150 | 3.0   | 4.6 | 6.1 |
| 9/16  | 2,374   | 0.00210 | 10.0  | 15.0 | 19.9 | 1,729   | 0.00158 | 5.45  | 8.17 | 10.89  | 1,733   | 0.00210 | 7.3   | 10.9 | 14.6             | 902   | 0.00158 | 2.8   | 4.3 | 5.7 |
| 5/8   | 2,137   | 0.00220 | 9.4   | 14.1 | 18.8 | 1,556   | 0.00165 | 5.14  | 7.70 | 10.27  | 1,560   | 0.00220 | 6.9   | 10.3 | 13.7             | 812   | 0.00165 | 2.7   | 4.0 | 5.4 |
| 11/16   | 1,943   | 0.00230 | 8.9   | 13.4 | 17.9 | 1,415   | 0.00173 | 4.88  | 7.32 | 9.76   | 1,418   | 0.00230 | 6.5   | 9.8  | 13.0             | 738   | 0.00173 | 2.5   | 3.8 | 5.1 |
| 3/4   | 1,781   | 0.00240 | 8.5   | 12.8 | 17.1 | 1,297   | 0.00180 | 4.67  | 7.00 | 9.34   | 1,300   | 0.00240 | 6.2   | 9.4  | 12.5             | 677   | 0.00180 | 2.4   | 3.7 | 4.9 |
| 7/8   | 1,526   | 0.00260 | 7.9   | 11.9 | 15.9 | 1,112   | 0.00195 | 4.33  | 6.50 | 8.67   | 1,114   | 0.00260 | 5.8   | 8.7  | 11.6             | 580   | 0.00195 | 2.3   | 3.4 | 4.5 |
| 1   | 1,335   | 0.00280 | 7.5   | 11.2 | 15.0 | 973   | 0.00210 | 4.08  | 6.13 | 8.17   | 975   | 0.00280 | 5.5   | 8.2  | 10.9             | 507   | 0.00210 | 2.1   | 3.2 | 4.3 |

Depth of cut  
切削量基準



rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

Unit/單位: mm



ISE


ISB

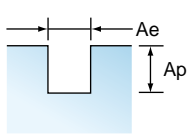
產品規格表 **P250-251**  
Specification page

產品規格表 **P252**  
Specification page

## ISE/ISB Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling<br> | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |     |     |     | CAST IRONS<br>Gray, Malleable, Ductile |   |     |      |      | STAINLESS STEELS<br>(Free Machining)<br>303, 416, 420F, 430F 440F |   |     |     |      | STAINLESS STEELS<br>(Difficult)<br>304, 304L, 316, 316L |   |     |     |     |
|---|---|---------|-----|-----|-----|--|---|-----|------|------|---|---|-----|-----|------|---|---|-----|-----|-----|
|   | Hardness<br>BRINELL                                     |         |     |     |     | HRC                                    |   |     |      |      | Vc<br>(SFM)   |   |     |     |      | Ae/Ap   |   |     |     |     |
| MILL DIA.<br>(inch)   |   |         |     |     | RPM | Fz                                     | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |     |      | RPM  | Fz  | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |     |     | RPM  | Fz  | Feed (IPM)<br>2 Flutes 3 Flutes<br>4 Flutes |     |     |     |
| 1/64  | 13675   | 0.00001 | 0.3 | 0.4 | 0.5 | 62,245                                 | 0.00003                                     | 3.7 | 5.6  | 7.5  | 68,748  | 0.00002                                     | 2.7 | 4.1 | 5.5  | 47,380  | 0.00002                                     | 1.9 | 2.8 | 3.8 |
| 1/32  | 6838  | 0.00003 | 0.3 | 0.5 | 0.7 | 31,122                                 | 0.00006                                     | 3.7 | 5.6  | 7.5  | 34,374  | 0.00005                                     | 3.4 | 5.2 | 6.9  | 23,690  | 0.00004                                     | 1.9 | 2.8 | 3.8 |
| 3/64  | 4558  | 0.00004 | 0.3 | 0.5 | 0.6 | 20,748                                 | 0.00010                                     | 4.1 | 6.2  | 8.3  | 22,916  | 0.00007                                     | 3.2 | 4.8 | 6.4  | 15,793  | 0.00006                                     | 1.9 | 2.8 | 3.8 |
| 1/16  | 3419  | 0.00005 | 0.3 | 0.5 | 0.6 | 15,561                                 | 0.00013                                     | 4.0 | 6.1  | 8.1  | 17,187  | 0.00009                                     | 3.1 | 4.6 | 6.2  | 11,845  | 0.00008                                     | 1.9 | 2.8 | 3.8 |
| 5/64  | 2735  | 0.00006 | 0.3 | 0.5 | 0.6 | 12,449                                 | 0.00018                                     | 4.5 | 6.7  | 9.0  | 13,750  | 0.00012                                     | 3.2 | 4.8 | 6.5  | 9,476   | 0.00011                                     | 2.1 | 3.1 | 4.2 |
| 3/32  | 2279  | 0.00007 | 0.3 | 0.5 | 0.7 | 10,374                                 | 0.00023                                     | 4.8 | 7.2  | 9.5  | 11,458  | 0.00015                                     | 3.3 | 5.0 | 6.6  | 7,897   | 0.00014                                     | 2.2 | 3.3 | 4.4 |
| 7/64  | 1954  | 0.00009 | 0.3 | 0.5 | 0.7 | 8,892                                  | 0.00027                                     | 4.8 | 7.2  | 9.6  | 9,821   | 0.00017                                     | 3.4 | 5.1 | 6.8  | 6,769   | 0.00017                                     | 2.3 | 3.5 | 4.6 |
| 1/8   | 1709  | 0.00010 | 0.3 | 0.5 | 0.7 | 7,781                                  | 0.00030                                     | 4.7 | 7.0  | 9.3  | 8,593   | 0.00020                                     | 3.4 | 5.2 | 6.9  | 5,923   | 0.00020                                     | 2.4 | 3.6 | 4.7 |
| 9/64  | 1519  | 0.00013 | 0.4 | 0.6 | 0.8 | 6,916                                  | 0.00036                                     | 5.0 | 7.5  | 10.0 | 7,639   | 0.00025                                     | 3.8 | 5.7 | 7.6  | 5,264   | 0.00024                                     | 2.5 | 3.8 | 5.0 |
| 5/32  | 1368  | 0.00015 | 0.4 | 0.6 | 0.8 | 6,224                                  | 0.00043                                     | 5.3 | 7.9  | 10.6 | 6,875   | 0.00030                                     | 4.1 | 6.2 | 8.2  | 4,738   | 0.00028                                     | 2.6 | 3.9 | 5.2 |
| 11/64   | 1243  | 0.00018 | 0.4 | 0.7 | 0.9 | 5,659                                  | 0.00049                                     | 5.5 | 8.3  | 11.0 | 6,250   | 0.00035                                     | 4.4 | 6.6 | 8.7  | 4,307   | 0.00031                                     | 2.7 | 4.0 | 5.4 |
| 3/16  | 1140  | 0.00020 | 0.5 | 0.7 | 0.9 | 5,187                                  | 0.00055                                     | 5.7 | 8.6  | 11.4 | 5,729   | 0.00040                                     | 4.6 | 6.9 | 9.2  | 3,948   | 0.00035                                     | 2.8 | 4.1 | 5.5 |
| 13/64   | 1052  | 0.00023 | 0.5 | 0.7 | 0.9 | 4,788                                  | 0.00061                                     | 5.9 | 8.8  | 11.7 | 5,288   | 0.00045                                     | 4.8 | 7.1 | 9.5  | 3,645   | 0.00039                                     | 2.8 | 4.2 | 5.6 |
| 7/32  | 977   | 0.00025 | 0.5 | 0.7 | 1.0 | 4,446                                  | 0.00068                                     | 6.0 | 9.0  | 12.0 | 4,911   | 0.00050                                     | 4.9 | 7.4 | 9.8  | 3,384   | 0.00043                                     | 2.9 | 4.3 | 5.8 |
| 15/64   | 912   | 0.00028 | 0.5 | 0.8 | 1.0 | 4,150                                  | 0.00074                                     | 6.1 | 9.2  | 12.2 | 4,583   | 0.00055                                     | 5.0 | 7.6 | 10.1 | 3,159   | 0.00046                                     | 2.9 | 4.4 | 5.8 |
| 1/4   | 855   | 0.00030 | 0.5 | 0.8 | 1.0 | 3,890                                  | 0.00080                                     | 6.2 | 9.3  | 12.4 | 4,297   | 0.00060                                     | 5.2 | 7.7 | 10.3 | 2,961   | 0.00050                                     | 3.0 | 4.4 | 5.9 |
| 17/64   | 804   | 0.00033 | 0.5 | 0.8 | 1.1 | 3,661                                  | 0.00089                                     | 6.5 | 9.7  | 13.0 | 4,044   | 0.00066                                     | 5.4 | 8.0 | 10.7 | 2,787   | 0.00055                                     | 3.1 | 4.6 | 6.1 |
| 9/32  | 760   | 0.00036 | 0.6 | 0.8 | 1.1 | 3,458                                  | 0.00098                                     | 6.7 | 10.1 | 13.5 | 3,819   | 0.00073                                     | 5.5 | 8.3 | 11.1 | 2,632   | 0.00060                                     | 3.2 | 4.7 | 6.3 |
| 19/64   | 720   | 0.00039 | 0.6 | 0.9 | 1.1 | 3,276                                  | 0.00106                                     | 7.0 | 10.4 | 13.9 | 3,618   | 0.00079                                     | 5.7 | 8.5 | 11.4 | 2,494   | 0.00065                                     | 3.2 | 4.9 | 6.5 |
| 5/16  | 684   | 0.00043 | 0.6 | 0.9 | 1.2 | 3,112                                  | 0.00115                                     | 7.2 | 10.7 | 14.3 | 3,437   | 0.00085                                     | 5.8 | 8.8 | 11.7 | 2,369   | 0.00070                                     | 3.3 | 5.0 | 6.6 |
| 21/64   | 651   | 0.00046 | 0.6 | 0.9 | 1.2 | 2,964                                  | 0.00124                                     | 7.3 | 11.0 | 14.7 | 3,274   | 0.00091                                     | 6.0 | 9.0 | 11.9 | 2,256   | 0.00075                                     | 3.4 | 5.1 | 6.8 |
| 11/32   | 622   | 0.00049 | 0.6 | 0.9 | 1.2 | 2,829                                  | 0.00133                                     | 7.5 | 11.2 | 15.0 | 3,125   | 0.00098                                     | 6.1 | 9.1 | 12.2 | 2,154   | 0.00080                                     | 3.4 | 5.2 | 6.9 |
| 23/64   | 595   | 0.00052 | 0.6 | 0.9 | 1.2 | 2,706                                  | 0.00141                                     | 7.6 | 11.5 | 15.3 | 2,989   | 0.00104                                     | 6.2 | 9.3 | 12.4 | 2,060   | 0.00085                                     | 3.5 | 5.3 | 7.0 |
| 3/8   | 570   | 0.00055 | 0.6 | 0.9 | 1.3 | 2,594                                  | 0.00150                                     | 7.8 | 11.7 | 15.6 | 2,864   | 0.00110                                     | 6.3 | 9.5 | 12.6 | 1,974   | 0.00090                                     | 3.6 | 5.3 | 7.1 |
| 25/64   | 547   | 0.00058 | 0.6 | 0.9 | 1.3 | 2,490                                  | 0.00156                                     | 7.8 | 11.7 | 15.6 | 2,750   | 0.00115                                     | 6.3 | 9.5 | 12.6 | 1,895   | 0.00094                                     | 3.6 | 5.3 | 7.1 |
| 13/32   | 526   | 0.00060 | 0.6 | 0.9 | 1.3 | 2,394                                  | 0.00163                                     | 7.8 | 11.7 | 15.6 | 2,644   | 0.00120                                     | 6.3 | 9.5 | 12.7 | 1,822   | 0.00098                                     | 3.6 | 5.3 | 7.1 |
| 27/64   | 506   | 0.00063 | 0.6 | 0.9 | 1.3 | 2,305                                  | 0.00169                                     | 7.8 | 11.7 | 15.6 | 2,546   | 0.00125                                     | 6.4 | 9.5 | 12.7 | 1,755   | 0.00101                                     | 3.6 | 5.3 | 7.1 |
| 7/16  | 488   | 0.00065 | 0.6 | 1.0 | 1.3 | 2,223                                  | 0.00175                                     | 7.8 | 11.7 | 15.6 | 2,455   | 0.00130                                     | 6.4 | 9.6 | 12.8 | 1,692   | 0.00105                                     | 3.6 | 5.3 | 7.1 |
| 29/64   | 472   | 0.00068 | 0.6 | 1.0 | 1.3 | 2,146                                  | 0.00181                                     | 7.8 | 11.7 | 15.6 | 2,371   | 0.00135                                     | 6.4 | 9.6 | 12.8 | 1,634   | 0.00109                                     | 3.6 | 5.3 | 7.1 |
| 15/32   | 456   | 0.00070 | 0.6 | 1.0 | 1.3 | 2,075                                  | 0.00188                                     | 7.8 | 11.7 | 15.6 | 2,292   | 0.00140                                     | 6.4 | 9.6 | 12.8 | 1,579   | 0.00125                                     | 3.9 | 5.9 | 7.9 |
| 31/64   | 441   | 0.00073 | 0.6 | 1.0 | 1.3 | 2,008                                  | 0.00194                                     | 7.8 | 11.7 | 15.6 | 2,218   | 0.00145                                     | 6.4 | 9.6 | 12.9 | 1,528   | 0.00116                                     | 3.6 | 5.3 | 7.1 |
| 1/2   | 427   | 0.00075 | 0.6 | 1.0 | 1.3 | 1,945                                  | 0.00200                                     | 7.8 | 11.7 | 15.6 | 2,148   | 0.00150                                     | 6.4 | 9.7 | 12.9 | 1,481   | 0.00120                                     | 3.6 | 5.3 | 7.1 |
| 9/16  | 380   | 0.00079 | 0.6 | 0.9 | 1.2 | 1,729                                  | 0.00210                                     | 7.3 | 10.9 | 14.5 | 1,910   | 0.00158                                     | 6.0 | 9.0 | 12.0 | 1,316   | 0.00125                                     | 3.3 | 4.9 | 6.6 |
| 5/8   | 342   | 0.00083 | 0.6 | 0.8 | 1.1 | 1,556                                  | 0.00220                                     | 6.8 | 10.3 | 13.7 | 1,719   | 0.00165                                     | 5.7 | 8.5 | 11.3 | 1,185   | 0.00130                                     | 3.1 | 4.6 | 6.2 |
| 11/16   | 311   | 0.00086 | 0.5 | 0.8 | 1.1 | 1,415                                  | 0.00230                                     | 6.5 | 9.8  | 13.0 | 1,562   | 0.00173                                     | 5.4 | 8.1 | 10.8 | 1,077   | 0.00135                                     | 2.9 | 4.4 | 5.8 |
| 3/4   | 285   | 0.00090 | 0.5 | 0.8 | 1.0 | 1,297                                  | 0.00240                                     | 6.2 | 9.3  | 12.4 | 1,432   | 0.00180                                     | 5.2 | 7.7 | 10.3 | 987   | 0.00140                                     | 2.8 | 4.1 | 5.5 |
| 7/8   | 244   | 0.00098 | 0.5 | 0.7 | 1.0 | 1,112                                  | 0.00260                                     | 5.8 | 8.7  | 11.6 | 1,228   | 0.00195                                     | 4.8 | 7.2 | 9.6  | 846   | 0.00155                                     | 2.6 | 3.9 | 5.2 |
| 1   | 214   | 0.00105 | 0.4 | 0.7 | 0.9 | 973                                    | 0.00280                                     | 5.4 | 8.2  | 10.9 | 1,074   | 0.00210                                     | 4.5 | 6.8 | 9.0  | 740   | 0.00170                                     | 2.5 | 3.8 | 5.0 |



Depth of cut  
切削量基準

rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

ISE

ISB

產品規格表 **P250-251**


產品規格表 **P252**

Specification page

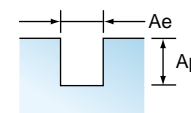
Specification page

## ISE/ISB Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling<br> | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, 718, Incoloy 800, Monel 400, Rene, Waspalloy |                        |                        |          |          | TITANIUM ALLOYS<br>Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si, Ti10Al2Fe3Al, Ti5Al53Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti52 Cr3Sn3Al |                        |                        |          |          | GRAPHITE             |                        |                        |          |          |
|---|---|------------------------|------------------------|----------|----------|---|------------------------|------------------------|----------|----------|----------------------|------------------------|------------------------|----------|----------|
|   | ≦ 300   |                        |                        |          |          | ≦ 350   |                        |                        |          |          |                      |                        |                        |          |          |
| Hardness BRINELL  | ≦ 32  |                        |                        |          |          | ≦ 37.9  |                        |                        |          |          |                      |                        |                        |          |          |
| HRC   | ≦ 32  |                        |                        |          |          | ≦ 37.9  |                        |                        |          |          |                      |                        |                        |          |          |
| Vc (SFM)  | 50  | (37-56)                |                        |          |          | 137   | (108-162)              |                        |          |          | 500                  | (399-599)              |                        |          |          |
| Ae/Ap   | Ae(2)=1D<br>Ap(2)=1D  | Ae(3)=1D<br>Ap(3)=0.5D | Ae(4)=1D<br>Ap(4)=0.4D |          |          | Ae(2)=1D<br>Ap(2)=1D  | Ae(3)=1D<br>Ap(3)=0.5D | Ae(4)=1D<br>Ap(4)=0.4D |          |          | Ae(2)=1D<br>Ap(2)=1D | Ae(3)=1D<br>Ap(3)=0.5D | Ae(4)=1D<br>Ap(4)=0.4D |          |          |
| MILL DIA.<br>(inch)   | RPM   | Fz                     | Feed (IPM)             |          |          | RPM   | Fz                     | Feed (IPM)             |          |          | RPM                  | Fz                     | Feed (IPM)             |          |          |
|   |   |                        | 2 Flutes               | 3 Flutes | 4 Flutes |   |                        | 2 Flutes               | 3 Flutes | 4 Flutes |                      |                        | 2 Flutes               | 3 Flutes | 4 Flutes |
| 1/64  | 12,077  | 0.00002                | 0.5                    | 0.7      | 1.0      | 33,445  | 0.00002                | 1.3                    | 2.0      | 2.7      | 122,631              | 0.00006                | 14.7                   | 22.1     | 29.4     |
| 1/32  | 6,039   | 0.00003                | 0.4                    | 0.5      | 0.7      | 16,722  | 0.00004                | 1.3                    | 2.0      | 2.7      | 61,316               | 0.00012                | 14.7                   | 22.1     | 29.4     |
| 3/64  | 4,026   | 0.00005                | 0.4                    | 0.5      | 0.7      | 11,148  | 0.00006                | 1.3                    | 2.0      | 2.7      | 40,877               | 0.00020                | 16.4                   | 24.5     | 32.7     |
| 1/16  | 3,019   | 0.00006                | 0.4                    | 0.5      | 0.7      | 8,361   | 0.00008                | 1.3                    | 2.0      | 2.7      | 30,658               | 0.00026                | 15.9                   | 23.9     | 31.9     |
| 5/64  | 2,415   | 0.00010                | 0.5                    | 0.7      | 0.9      | 6,689   | 0.00011                | 1.5                    | 2.2      | 2.9      | 24,526               | 0.00036                | 17.7                   | 26.5     | 35.3     |
| 3/32  | 2,013   | 0.00013                | 0.5                    | 0.8      | 1.0      | 5,574   | 0.00014                | 1.6                    | 2.3      | 3.1      | 20,439               | 0.00046                | 18.8                   | 28.2     | 37.6     |
| 7/64  | 1,725   | 0.00017                | 0.6                    | 0.9      | 1.1      | 4,778   | 0.00017                | 1.6                    | 2.4      | 3.2      | 17,519               | 0.00054                | 18.9                   | 28.4     | 37.8     |
| 1/8   | 1,510   | 0.00020                | 0.6                    | 0.9      | 1.2      | 4,181   | 0.00020                | 1.7                    | 2.5      | 3.3      | 15,329               | 0.00060                | 18.4                   | 27.6     | 36.8     |
| 9/64  | 1,342   | 0.00023                | 0.6                    | 0.9      | 1.2      | 3,716   | 0.00024                | 1.8                    | 2.6      | 3.5      | 13,626               | 0.00073                | 19.8                   | 29.6     | 39.5     |
| 5/32  | 1,208   | 0.00025                | 0.6                    | 0.9      | 1.2      | 3,344   | 0.00028                | 1.8                    | 2.8      | 3.7      | 12,263               | 0.00085                | 20.8                   | 31.3     | 41.7     |
| 11/64   | 1,098   | 0.00028                | 0.6                    | 0.9      | 1.2      | 3,040   | 0.00031                | 1.9                    | 2.9      | 3.8      | 11,148               | 0.00098                | 21.7                   | 32.6     | 43.5     |
| 3/16  | 1,006   | 0.00030                | 0.6                    | 0.9      | 1.2      | 2,787   | 0.00035                | 2.0                    | 2.9      | 3.9      | 10,219               | 0.00110                | 22.5                   | 33.7     | 45.0     |
| 13/64   | 929   | 0.00033                | 0.6                    | 0.9      | 1.2      | 2,573   | 0.00039                | 2.0                    | 3.0      | 4.0      | 9,433                | 0.00123                | 23.1                   | 34.7     | 46.2     |
| 7/32  | 863   | 0.00035                | 0.6                    | 0.9      | 1.2      | 2,389   | 0.00043                | 2.0                    | 3.0      | 4.1      | 8,759                | 0.00135                | 23.7                   | 35.5     | 47.3     |
| 15/64   | 805   | 0.00038                | 0.6                    | 0.9      | 1.2      | 2,230   | 0.00046                | 2.1                    | 3.1      | 4.1      | 8,175                | 0.00148                | 24.1                   | 36.2     | 48.2     |
| 1/4   | 755   | 0.00040                | 0.6                    | 0.9      | 1.2      | 2,090   | 0.00050                | 2.1                    | 3.1      | 4.2      | 7,664                | 0.00160                | 24.5                   | 36.8     | 49.1     |
| 17/64   | 710   | 0.00045                | 0.6                    | 1.0      | 1.3      | 1,967   | 0.00055                | 2.2                    | 3.2      | 4.3      | 7,214                | 0.00178                | 25.6                   | 38.4     | 51.2     |
| 9/32  | 671   | 0.00050                | 0.7                    | 1.0      | 1.3      | 1,858   | 0.00060                | 2.2                    | 3.3      | 4.5      | 6,813                | 0.00195                | 26.6                   | 39.9     | 53.1     |
| 19/64   | 636   | 0.00055                | 0.7                    | 1.0      | 1.4      | 1,760   | 0.00065                | 2.3                    | 3.4      | 4.6      | 6,454                | 0.00213                | 27.4                   | 41.1     | 54.9     |
| 5/16  | 604   | 0.00060                | 0.7                    | 1.1      | 1.4      | 1,672   | 0.00070                | 2.3                    | 3.5      | 4.7      | 6,132                | 0.00230                | 28.2                   | 42.3     | 56.4     |
| 21/64   | 575   | 0.00065                | 0.7                    | 1.1      | 1.5      | 1,593   | 0.00075                | 2.4                    | 3.6      | 4.8      | 5,840                | 0.00248                | 28.9                   | 43.4     | 57.8     |
| 11/32   | 549   | 0.00070                | 0.8                    | 1.2      | 1.5      | 1,520   | 0.00080                | 2.4                    | 3.6      | 4.9      | 5,574                | 0.00265                | 29.5                   | 44.3     | 59.1     |
| 23/64   | 525   | 0.00075                | 0.8                    | 1.2      | 1.6      | 1,454   | 0.00085                | 2.5                    | 3.7      | 4.9      | 5,332                | 0.00283                | 30.1                   | 45.2     | 60.2     |
| 3/8   | 503   | 0.00080                | 0.8                    | 1.2      | 1.6      | 1,394   | 0.00090                | 2.5                    | 3.8      | 5.0      | 5,110                | 0.00300                | 30.7                   | 46.0     | 61.3     |
| 25/64   | 483   | 0.00083                | 0.8                    | 1.2      | 1.6      | 1,338   | 0.00094                | 2.5                    | 3.8      | 5.0      | 4,905                | 0.00313                | 30.7                   | 46.0     | 61.3     |
| 13/32   | 465   | 0.00085                | 0.8                    | 1.2      | 1.6      | 1,286   | 0.00098                | 2.5                    | 3.8      | 5.0      | 4,717                | 0.00325                | 30.7                   | 46.0     | 61.3     |
| 27/64   | 447   | 0.00088                | 0.8                    | 1.2      | 1.6      | 1,239   | 0.00101                | 2.5                    | 3.8      | 5.0      | 4,542                | 0.00338                | 30.7                   | 46.0     | 61.3     |
| 7/16  | 431   | 0.00090                | 0.8                    | 1.2      | 1.6      | 1,194   | 0.00105                | 2.5                    | 3.8      | 5.0      | 4,380                | 0.00350                | 30.7                   | 46.0     | 61.3     |
| 29/64   | 416   | 0.00093                | 0.8                    | 1.2      | 1.5      | 1,153   | 0.00109                | 2.5                    | 3.8      | 5.0      | 4,229                | 0.00363                | 30.7                   | 46.0     | 61.3     |
| 15/32   | 403   | 0.00095                | 0.8                    | 1.1      | 1.5      | 1,115   | 0.00125                | 2.8                    | 4.2      | 5.6      | 4,088                | 0.00375                | 30.7                   | 46.0     | 61.3     |
| 31/64   | 390   | 0.00098                | 0.8                    | 1.1      | 1.5      | 1,079   | 0.00116                | 2.5                    | 3.8      | 5.0      | 3,956                | 0.00388                | 30.7                   | 46.0     | 61.3     |
| 1/2   | 377   | 0.00100                | 0.8                    | 1.1      | 1.5      | 1,045   | 0.00120                | 2.5                    | 3.8      | 5.0      | 3,832                | 0.00400                | 30.7                   | 46.0     | 61.3     |
| 9/16  | 335   | 0.00105                | 0.7                    | 1.1      | 1.4      | 929   | 0.00125                | 2.3                    | 3.5      | 4.6      | 3,406                | 0.00420                | 28.6                   | 42.9     | 57.2     |
| 5/8   | 302   | 0.00110                | 0.7                    | 1.0      | 1.3      | 836   | 0.00130                | 2.2                    | 3.3      | 4.3      | 3,066                | 0.00440                | 27.0                   | 40.5     | 54.0     |
| 11/16   | 274   | 0.00115                | 0.6                    | 0.9      | 1.3      | 760   | 0.00135                | 2.1                    | 3.1      | 4.1      | 2,787                | 0.00460                | 25.6                   | 38.5     | 51.3     |
| 3/4   | 252   | 0.00120                | 0.6                    | 0.9      | 1.2      | 697   | 0.00140                | 2.0                    | 2.9      | 3.9      | 2,555                | 0.00480                | 24.5                   | 36.8     | 49.1     |
| 7/8   | 216   | 0.00155                | 0.7                    | 1.0      | 1.3      | 597   | 0.00155                | 1.9                    | 2.8      | 3.7      | 2,190                | 0.00520                | 22.8                   | 34.2     | 45.5     |
| 1   | 189   | 0.00140                | 0.5                    | 0.8      | 1.1      | 523   | 0.00170                | 1.8                    | 2.7      | 3.6      | 1,916                | 0.00560                | 21.5                   | 32.2     | 42.9     |

Depth of cut  
切削量基準



rpm=sfm×3.82/D1  
ipm=(inch/flute)×4×rpm

IAE5

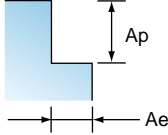
產品規格表 **P253**  
Specification page

IAUE

產品規格表 **P254**  
Specification page

## IAE5 / IAUE Series Cutting Condition 標準切削

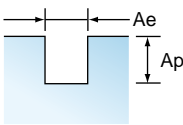
**FRACTIONAL 英制**

| Side Milling       |        | ALUMINUM ALLOYS<br>2017,2024,356,6061,7075  |                         |                         |        | COPPER ALLOYS<br>Alum Bronze,C110,Muntz Brass |                         |                         |  |
|--------------------|--------|---|-------------------------|-------------------------|--------|---|-------------------------|-------------------------|--|
| Hardness BRINELL   |        | ≦ 150   |                         |                         |        | ≦ 140   |                         |                         |  |
| HRC                |        | ≦ 80 HRB  |                         |                         |        | ≦ 76.4 HRB                                    |                         |                         |  |
| Vc (sfm)           |        | 968 (810~1214)  |                         |                         |        | 533 (446~669)                                 |                         |                         |  |
| MILL DIA. (inch)   | RPM    | Fz  | Feed (IPM) IAUE-3Flutes | Feed (IPM) IAE5-2Flutes | RPM    | Fz  | Feed (IPM) IAUE-3Flutes | Feed (IPM) IAE5-2Flutes |  |
| 1/8                | 29,380 | 0.00060   | 52.9                    | 35.3                    | 16,193 | 0.00030                                       | 14.6                    | 9.7                     |  |
| 3/16               | 19,587 | 0.00110   | 64.6                    | 43.1                    | 10,795 | 0.00055                                       | 17.8                    | 11.9                    |  |
| 1/4                | 14,690 | 0.00160   | 70.5                    | 47.0                    | 8,096  | 0.00080                                       | 19.4                    | 13.3                    |  |
| 5/16               | 11,752 | 0.00230   | 81.1                    | 54.1                    | 6,477  | 0.00115                                       | 22.3                    | 14.9                    |  |
| 3/8                | 9,793  | 0.00300   | 88.1                    | 58.8                    | 5,398  | 0.00150                                       | 24.3                    | 16.2                    |  |
| 1/2                | 7,345  | 0.00400   | 88.1                    | 58.8                    | 4,048  | 0.00200                                       | 24.3                    | 16.2                    |  |
| 5/8                | 5,876  | 0.00440   | 77.6                    | 51.7                    | 3,239  | 0.00220                                       | 21.4                    | 14.3                    |  |
| 3/4                | 4,897  | 0.00480   | 70.5                    | 47.0                    | 2,699  | 0.00240                                       | 19.4                    | 13                      |  |
| 1                  | 3,673  | 0.00560   | 61.7                    | 41.1                    | 2,024  | 0.00280                                       | 17.0                    | 11.3                    |  |
| Depth of cut 切削量基準 |        |  |                         |                         |        |   |                         |                         |  |

$$rpm = sfm \times 3.82 / D1$$

$$Feed(IPM) = RPM \times Fz \times T(Flute)$$

**FRACTIONAL 英制**

| Slot Milling       |        | ALUMINUM ALLOYS<br>2017,2024,356,6061,7075  |                         |                         |        | COPPER ALLOYS<br>Alum Bronze,C110,Muntz Brass |                         |                         |  |
|--------------------|--------|---|-------------------------|-------------------------|--------|---|-------------------------|-------------------------|--|
| Hardness BRINELL   |        | ≦ 150   |                         |                         |        | ≦ 140   |                         |                         |  |
| HRC                |        | ≦ 80 HRB  |                         |                         |        | ≦ 76.4 HRB                                    |                         |                         |  |
| Vc (sfm)           |        | 810 (648~972)   |                         |                         |        | 446 (357~535)                                 |                         |                         |  |
| MILL DIA. (inch)   | RPM    | Fz  | Feed (IPM) IAUE-3Flutes | Feed (IPM) IAE5-2Flutes | RPM    | Fz  | Feed (IPM) IAUE-3Flutes | Feed (IPM) IAE5-2Flutes |  |
| 1/8                | 23,504 | 0.00060   | 42.3                    | 28.2                    | 12,954 | 0.00030                                       | 11.7                    | 7.8                     |  |
| 3/16               | 15,670 | 0.00110   | 51.7                    | 34.5                    | 8,636  | 0.00055                                       | 14.2                    | 9.5                     |  |
| 1/4                | 11,752 | 0.00160   | 56.4                    | 37.6                    | 6,477  | 0.00080                                       | 15.5                    | 10.4                    |  |
| 5/16               | 9,402  | 0.00230   | 64.9                    | 43.2                    | 5,182  | 0.00115                                       | 17.9                    | 11.9                    |  |
| 3/8                | 7,835  | 0.00300   | 70.5                    | 47.0                    | 4,318  | 0.00150                                       | 19.4                    | 13.0                    |  |
| 1/2                | 5,876  | 0.00400   | 70.5                    | 47.0                    | 3,239  | 0.00200                                       | 19.4                    | 13.0                    |  |
| 5/8                | 4,701  | 0.00440   | 62.1                    | 41.4                    | 2,591  | 0.00220                                       | 17.1                    | 11.4                    |  |
| 3/4                | 3,917  | 0.00480   | 56.4                    | 37.6                    | 2,159  | 0.00240                                       | 15.5                    | 10.4                    |  |
| 1                  | 2,938  | 0.00560   | 49.4                    | 32.9                    | 1,619  | 0.00280                                       | 13.6                    | 9.1                     |  |
| Depth of cut 切削量基準 |        |  |                         |                         |        |   |                         |                         |  |

$$rpm = sfm \times 3.82 / D1$$

$$Feed(IPM) = RPM \times Fz \times T(Flute)$$

產品規格表 **P255**  
Specification page

## IPVE Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| Side Milling        | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |           |                           | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |           |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |           |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |                |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |                |                           |
|---------------------|---|-----------|---------------------------|---|-----------|---------------------------|---|-----------|---------------------------|---|----------------|---------------------------|---|----------------|---------------------------|
|                     | Hardness<br>BRINELL   | ≤ 275     |                           |   | ≤ 375     |                           |   | ≤ 375     |                           |   | ≥ 375<br>≤ 475 |                           |   | ≥ 475<br>≤ 655 |                           |
| HRC                 | ≤ 28.5  |           |                           | ≤ 39.8  |           |                           | ≤ 39.8  |           |                           | ≥ 39.8<br>≤ 49.1  |                |                           | ≥ 50<br>≤ 65  |                |                           |
| Vc<br>(SFM)         | 555   | (442-662) |                           | 315   | (253-378) |                           | 405   | (324-486) |                           | 210   | (168-252)      |                           | 90  | (72-108)       |                           |
| Ae/Ap               | Ae=0.5D<br>Ap=1.5D  |           |                           | Ae=0.5D<br>Ap=1.5D  |           |                           | Ae=0.5D<br>Ap=1.5D                                      |           |                           | Ae=0.5D<br>Ap=1.5D                                      |                |                           | Ae=0.5D<br>Ap=1.5D                                      |                |                           |
| MILL DIA.<br>(inch) | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz             | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz             | Feed<br>(IPM)<br>4 Flutes |
| 1/8                 | 16,894  | 0.00040   | 27.0                      | 9,629   | 0.00030   | 11.56                     | 12,332  | 0.00050   | 24.7                      | 6,420   | 0.00040        | 10.3                      | 2,703   | 0.00020        | 2.2                       |
| 9/64                | 15,017  | 0.00048   | 28.5                      | 8,559   | 0.00028   | 9.42                      | 10,962  | 0.00059   | 25.8                      | 5,706   | 0.00048        | 10.8                      | 2,403   | 0.00024        | 2.3                       |
| 5/32                | 13,515  | 0.00055   | 29.7                      | 7,704   | 0.00035   | 10.78                     | 9,866   | 0.00068   | 26.6                      | 5,136   | 0.00055        | 11.3                      | 2,162   | 0.00028        | 2.4                       |
| 11/64               | 12,286  | 0.00063   | 30.7                      | 7,003   | 0.00043   | 11.91                     | 8,969   | 0.00076   | 27.4                      | 4,669   | 0.00063        | 11.7                      | 1,966   | 0.00031        | 2.5                       |
| 3/16                | 11,262  | 0.00070   | 31.5                      | 6,420   | 0.00050   | 12.84                     | 8,222   | 0.00085   | 28.0                      | 4,280   | 0.00070        | 12.0                      | 1,802   | 0.00035        | 2.5                       |
| 13/64               | 10,396  | 0.00078   | 32.2                      | 5,926   | 0.00058   | 13.63                     | 7,589   | 0.00094   | 28.5                      | 3,951   | 0.00078        | 12.2                      | 1,663   | 0.00039        | 2.6                       |
| 7/32                | 9,654   | 0.00085   | 32.8                      | 5,503   | 0.00065   | 14.31                     | 7,047   | 0.00103   | 28.9                      | 3,668   | 0.00085        | 12.5                      | 1,545   | 0.00043        | 2.6                       |
| 15/64               | 9,010   | 0.00093   | 33.3                      | 5,136   | 0.00073   | 14.89                     | 6,577   | 0.00111   | 29.3                      | 3,424   | 0.00093        | 12.7                      | 1,442   | 0.00046        | 2.7                       |
| 1/4                 | 8,447   | 0.00100   | 33.8                      | 4,815   | 0.00080   | 15.41                     | 6,166   | 0.00120   | 29.6                      | 3,210   | 0.00100        | 1.3                       | 1,351   | 0.00005        | 0.3                       |
| 17/64               | 7,950   | 0.00113   | 35.8                      | 4,531   | 0.00088   | 15.86                     | 5,803   | 0.00134   | 31.0                      | 3,021   | 0.00113        | 13.6                      | 1,272   | 0.00056        | 2.9                       |
| 9/32                | 7,508   | 0.00123   | 36.9                      | 4,280   | 0.00095   | 16.26                     | 5,481   | 0.00148   | 32.3                      | 2,853   | 0.00123        | 14.0                      | 1,201   | 0.00061        | 2.9                       |
| 19/64               | 7,113   | 0.00134   | 38.1                      | 4,054   | 0.00103   | 16.62                     | 5,193   | 0.00161   | 33.5                      | 2,703   | 0.00134        | 14.5                      | 1,138   | 0.00067        | 3.0                       |
| 5/16                | 6,757   | 0.00145   | 39.2                      | 3,852   | 0.00110   | 16.95                     | 4,933   | 0.00175   | 34.5                      | 2,568   | 0.00145        | 14.9                      | 1,081   | 0.00073        | 3.1                       |
| 21/64               | 6,436   | 0.00156   | 40.2                      | 3,668   | 0.00118   | 17.24                     | 4,698   | 0.00189   | 35.5                      | 2,446   | 0.00156        | 15.3                      | 1,030   | 0.00078        | 3.2                       |
| 11/32               | 6,143   | 0.00168   | 41.3                      | 3,502   | 0.00125   | 17.51                     | 4,485   | 0.00203   | 36.3                      | 2,334   | 0.00168        | 15.6                      | 983   | 0.00084        | 3.3                       |
| 23/64               | 5,876   | 0.00178   | 41.8                      | 3,349   | 0.00133   | 17.75                     | 4,290   | 0.00216   | 37.1                      | 2,233   | 0.00178        | 16.0                      | 940   | 0.00089        | 3.4                       |
| 3/8                 | 5,631   | 0.00190   | 42.8                      | 3,210   | 0.00140   | 17.97                     | 4,111   | 0.00230   | 37.8                      | 2,140   | 0.00190        | 16.3                      | 901   | 0.00095        | 3.4                       |
| 25/64               | 5,406   | 0.00198   | 42.7                      | 3,081   | 0.00146   | 18.03                     | 3,946   | 0.00239   | 37.7                      | 2,054   | 0.00198        | 16.2                      | 865   | 0.00099        | 3.4                       |
| 13/32               | 5,198   | 0.00205   | 42.6                      | 2,963   | 0.00153   | 18.07                     | 3,795   | 0.00248   | 37.6                      | 1,975   | 0.00205        | 16.2                      | 832   | 0.00103        | 3.4                       |
| 27/64               | 5,006   | 0.00213   | 42.5                      | 2,853   | 0.00159   | 18.12                     | 3,654   | 0.00256   | 37.5                      | 1,902   | 0.00213        | 16.2                      | 801   | 0.00106        | 3.4                       |
| 7/16                | 4,827   | 0.00220   | 42.5                      | 2,751   | 0.00165   | 18.16                     | 3,524   | 0.00265   | 37.3                      | 1,834   | 0.00220        | 16.1                      | 772   | 0.00110        | 3.4                       |
| 29/64               | 4,660   | 0.00228   | 42.4                      | 2,656   | 0.00171   | 18.20                     | 3,402   | 0.00274   | 37.3                      | 1,771   | 0.00228        | 16.1                      | 746   | 0.00114        | 3.4                       |
| 15/32               | 4,505   | 0.00235   | 42.3                      | 2,568   | 0.00178   | 18.23                     | 3,289   | 0.00283   | 37.2                      | 1,712   | 0.00235        | 16.1                      | 721   | 0.00118        | 3.4                       |
| 31/64               | 4,360   | 0.00243   | 42.3                      | 2,485   | 0.00184   | 18.26                     | 3,183   | 0.00291   | 37.1                      | 1,657   | 0.00243        | 16.1                      | 698   | 0.00121        | 3.4                       |
| 1/2                 | 4,223   | 0.00250   | 42.2                      | 2,407   | 0.00190   | 18.30                     | 3,083   | 0.00300   | 37.0                      | 1,605   | 0.00250        | 16.0                      | 676   | 0.00125        | 3.4                       |
| 9/16                | 3,754   | 0.00210   | 31.5                      | 2,140   | 0.00215   | 18.40                     | 2,741   | 0.00345   | 37.8                      | 1,427   | 0.00285        | 16.3                      | 601   | 0.00143        | 3.4                       |
| 5/8                 | 3,379   | 0.00310   | 41.9                      | 1,926   | 0.00240   | 18.49                     | 2,466   | 0.00390   | 38.5                      | 1,284   | 0.00320        | 16.4                      | 541   | 0.00160        | 3.5                       |
| 11/16               | 3,072   | 0.00315   | 38.7                      | 1,751   | 0.00245   | 17.16                     | 2,242   | 0.00405   | 36.3                      | 1,167   | 0.00335        | 15.6                      | 491   | 0.00168        | 3.3                       |
| 3/4                 | 2,816   | 0.00320   | 36.0                      | 1,605   | 0.00250   | 16.05                     | 2,055   | 0.00420   | 34.5                      | 1,070   | 0.00350        | 15.0                      | 450   | 0.00175        | 3.2                       |
| 7/8                 | 2,413   | 0.00335   | 32.3                      | 1,376   | 0.00260   | 14.31                     | 1,762   | 0.00460   | 32.4                      | 917   | 0.00365        | 13.4                      | 386   | 0.00183        | 2.8                       |
| 1                   | 2,112   | 0.00350   | 29.6                      | 1,204   | 0.00270   | 13.00                     | 1,542   | 0.00500   | 30.8                      | 802   | 0.00380        | 12.2                      | 338   | 0.00190        | 2.6                       |

Depth of cut  
切削量基準

產品規格表 **P255**  
Specification page

## IPVE Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| SideMilling         | CAST IRONS<br>LOW&MEDIUM ALLOY)<br>Gray, Malleable, Ductile |           | CAST IRONS<br>(HIGH ALLOY)<br>Gray, Malleable, Ductile |           | STAINLESS STEELS<br>(FREE MACHINING )<br>304, 416,420F,430F,440F |                           |        | STAINLESS STEELS<br>(DIFFICULT )<br>304, 304L,316,316L |                           |        | STAINLESS STEELS(PH)<br>13-8 PH,15-5PH,17-4PH,<br>Custom 450 |                           |       |         |                           |
|---------------------|---|-----------|--|-----------|--|---------------------------|--------|--|---------------------------|--------|--|---------------------------|-------|---------|---------------------------|
| Hardness<br>BRINELL | ≤ 220   |           | ≥ 220<br>≧ 260   |           | ≤ 275  |                           |        | ≤ 275  |                           |        | ≤ 325  |                           |       |         |                           |
| HRC                 | ≤ 18.8  |           | ≥ 18.8<br>≧ 26.6                                       |           | ≤ 28.5   |                           |        | ≤ 28.5   |                           |        | ≤ 34.4   |                           |       |         |                           |
| Vc<br>(SFM)         | 355   | (284-426) | 340  | (272-408) | 490  | (392-588)                 |        | 340  | (272-408)                 |        | 310  | (248-372)                 |       |         |                           |
| Ae/Ap               | Ae=0.5D<br>Ap=1.5D  |           | Ae=0.5D<br>Ap=1.5D                                     |           | Ae=0.5D<br>Ap=1.5D   |                           |        | Ae=0.5D<br>Ap=1.5D                                     |                           |        | Ae=0.5D<br>Ap=1.5D   |                           |       |         |                           |
| MILL DIA.<br>(inch) | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes                              | RPM       | Fz   | Feed<br>(IPM)<br>4 Flutes | RPM    | Fz   | Feed<br>(IPM)<br>4 Flutes | RPM    | Fz   | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz      | Feed<br>(IPM)<br>4 Flutes |
| 1/8                 | 10,812  | 0.00040   | 17.3   | 10,305    | 0.00030  | 12.40                     | 14,866 | 0.00030  | 17.8                      | 10,305 | 0.00020  | 8.2                       | 9,460 | 0.00020 | 7.6                       |
| 9/64                | 9,611   | 0.00048   | 18.3   | 9,160     | 0.00035  | 12.80                     | 13,215 | 0.00035  | 18.5                      | 9,160  | 0.00025  | 9.2                       | 8,409 | 0.00025 | 8.4                       |
| 5/32                | 8,650   | 0.00055   | 19.0   | 8,244     | 0.00040  | 13.20                     | 11,893 | 0.00040  | 19.0                      | 8,244  | 0.00030  | 9.9                       | 7,568 | 0.00030 | 9.1                       |
| 11/64               | 7,863   | 0.00063   | 19.7   | 7,495     | 0.00045  | 13.50                     | 10,812 | 0.00045  | 19.5                      | 7,495  | 0.00035  | 10.5                      | 6,880 | 0.00035 | 9.6                       |
| 3/16                | 7,208   | 0.00070   | 20.2   | 6,870     | 0.00050  | 13.70                     | 9,911  | 0.00050  | 19.8                      | 6,870  | 0.00040  | 11.0                      | 6,307 | 0.00040 | 10.1                      |
| 13/64               | 6,654   | 0.00078   | 20.6   | 6,342     | 0.00055  | 14.00                     | 9,149  | 0.00055  | 20.1                      | 6,342  | 0.00045  | 11.4                      | 5,822 | 0.00045 | 10.5                      |
| 7/32                | 6,178   | 0.00085   | 21.0   | 5,889     | 0.00060  | 14.10                     | 8,495  | 0.00060  | 20.4                      | 5,889  | 0.00050  | 11.8                      | 5,406 | 0.00050 | 10.8                      |
| 15/64               | 5,766   | 0.00093   | 21.3   | 5,496     | 0.00065  | 14.30                     | 7,929  | 0.00065  | 20.6                      | 5,496  | 0.00055  | 12.1                      | 5,046 | 0.00055 | 11.1                      |
| 1/4                 | 5,406   | 0.00100   | 21.6   | 5,153     | 0.00070  | 14.40                     | 7,433  | 0.00070  | 20.8                      | 5,153  | 0.00060  | 12.4                      | 4,730 | 0.00060 | 11.4                      |
| 17/64               | 5,088   | 0.00110   | 22.4   | 4,849     | 0.00079  | 15.30                     | 6,996  | 0.00079  | 22.0                      | 4,849  | 0.00066  | 12.9                      | 4,452 | 0.00066 | 11.8                      |
| 9/32                | 4,805   | 0.00120   | 23.1   | 4,580     | 0.00088  | 16.00                     | 6,607  | 0.00088  | 23.1                      | 4,580  | 0.00073  | 13.3                      | 4,205 | 0.00073 | 12.2                      |
| 19/64               | 4,552   | 0.00130   | 23.7   | 4,339     | 0.00096  | 16.70                     | 6,260  | 0.00096  | 24.1                      | 4,339  | 0.00079  | 13.7                      | 3,983 | 0.00079 | 12.5                      |
| 5/16                | 4,325   | 0.00140   | 24.2   | 4,122     | 0.00105  | 17.30                     | 5,947  | 0.00105  | 25.0                      | 4,122  | 0.00085  | 14.0                      | 3,784 | 0.00085 | 12.9                      |
| 21/64               | 4,119   | 0.00150   | 24.7   | 3,926     | 0.00114  | 17.90                     | 5,663  | 0.00114  | 25.8                      | 3,926  | 0.00091  | 14.3                      | 3,604 | 0.00091 | 13.2                      |
| 11/32               | 3,932   | 0.00160   | 25.2   | 3,747     | 0.00123  | 18.40                     | 5,406  | 0.00123  | 26.5                      | 3,747  | 0.00098  | 14.6                      | 3,440 | 0.00098 | 13.4                      |
| 23/64               | 3,761   | 0.00170   | 25.6   | 3,584     | 0.00131  | 18.80                     | 5,171  | 0.00131  | 27.1                      | 3,584  | 0.00104  | 14.9                      | 3,291 | 0.00104 | 13.7                      |
| 3/8                 | 3,604   | 0.00180   | 25.9   | 3,435     | 0.00140  | 19.20                     | 4,955  | 0.00140  | 27.8                      | 3,435  | 0.00110  | 15.1                      | 3,153 | 0.00110 | 13.9                      |
| 25/64               | 3,460   | 0.00188   | 25.9   | 3,298     | 0.00145  | 19.10                     | 4,757  | 0.00145  | 27.6                      | 3,298  | 0.00114  | 15.0                      | 3,027 | 0.00114 | 13.8                      |
| 13/32               | 3,327   | 0.00195   | 25.9   | 3,171     | 0.00150  | 19.00                     | 4,574  | 0.00150  | 27.4                      | 3,171  | 0.00118  | 14.9                      | 2,911 | 0.00118 | 13.7                      |
| 27/64               | 3,204   | 0.00203   | 25.9   | 3,053     | 0.00155  | 18.90                     | 4,405  | 0.00155  | 27.3                      | 3,053  | 0.00121  | 14.8                      | 2,803 | 0.00121 | 13.6                      |
| 7/16                | 3,089   | 0.00210   | 25.9   | 2,944     | 0.00160  | 18.80                     | 4,248  | 0.00160  | 27.2                      | 2,944  | 0.00125  | 14.7                      | 2,703 | 0.00125 | 13.5                      |
| 29/64               | 2,983   | 0.00218   | 25.9   | 2,843     | 0.00165  | 18.80                     | 4,101  | 0.00165  | 27.1                      | 2,843  | 0.0013   | 14.6                      | 2,610 | 0.0013  | 13.4                      |
| 15/32               | 2,883   | 0.00225   | 25.9   | 2,748     | 0.00170  | 18.70                     | 3,964  | 0.00170  | 27.0                      | 2,748  | 0.00133  | 14.5                      | 2,523 | 0.00133 | 13.3                      |
| 31/64               | 2,790   | 0.00233   | 25.9   | 2,659     | 0.00175  | 18.60                     | 3,837  | 0.00175  | 26.9                      | 2,659  | 0.00136  | 14.4                      | 2,441 | 0.00136 | 13.2                      |
| 1/2                 | 2,703   | 0.00240   | 25.9   | 2,576     | 0.00180  | 18.50                     | 3,717  | 0.00180  | 26.8                      | 2,576  | 0.00140  | 14.3                      | 2,365 | 0.00140 | 13.1                      |
| 9/16                | 2,403   | 0.00270   | 25.9   | 2,290     | 0.00205  | 18.80                     | 3,304  | 0.00205  | 27.1                      | 2,290  | 0.00160  | 14.7                      | 2,102 | 0.00160 | 13.5                      |
| 5/8                 | 2,162   | 0.00300   | 25.9   | 2,061     | 0.00230  | 19.00                     | 2,973  | 0.00230  | 27.4                      | 2,061  | 0.00180  | 14.8                      | 1,892 | 0.00180 | 13.6                      |
| 11/16               | 1,966   | 0.00305   | 24.0   | 1,874     | 0.00245  | 18.40                     | 2,703  | 0.00245  | 26.5                      | 1,874  | 0.00185  | 13.9                      | 1,720 | 0.00185 | 12.7                      |
| 3/4                 | 1,802   | 0.00310   | 22.3   | 1,718     | 0.00240  | 16.50                     | 2,478  | 0.00240  | 23.8                      | 1,718  | 0.00190  | 13.1                      | 1,577 | 0.00190 | 12.0                      |
| 7/8                 | 1,545   | 0.00325   | 20.1   | 1,472     | 0.00245  | 14.40                     | 2,124  | 0.00245  | 20.8                      | 1,472  | 0.00195  | 11.5                      | 1,351 | 0.00195 | 10.5                      |
| 1                   | 1,351   | 0.00340   | 18.4   | 1,288     | 0.00250  | 12.90                     | 1,858  | 0.00250  | 18.6                      | 1,288  | 0.00200  | 10.3                      | 1,183 | 0.00200 | 9.5                       |

Depth of cut  
切削量基準

The diagram illustrates the geometry of a side milling operation. It shows a blue L-shaped tool cutting into a workpiece. The vertical dimension of the cut is labeled as  $A_p$  (Depth of cut), and the horizontal dimension of the cut is labeled as  $A_e$  (Axial depth of cut).

產品規格表 **P255**  
Specification page

## IPVE Series Side CUTTING 側面切削

**FRACTIONAL 英制**

| SideMilling<br> | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, Incoly 800, Monel 400 |         |                           | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 718, 750X, Incoly 925, Waspalloy, Hastelloy, Rene |         |                           | TITANIUM ALLOYS<br>Pure Titanium, Ti6Al4V,<br>Ti6Al2Sn4Zr2Mo,<br>Ti4Al4Mo2Sn0.5Si |           |                           | TITANIUM ALLOYS<br>(DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr,<br>Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo,<br>Ti6Al6V6Sn, Ti15V3<br>Cr3Sn3Al |                |                           |
|--|--|---------|---------------------------|---|---------|---------------------------|---|-----------|---------------------------|---|----------------|---------------------------|
|  | Hardness<br>BRINELL  | ≤ 300   |                           |   | > 300   |                           |   | ≤ 350     |                           |   | > 350<br>≤ 440 |                           |
| HRC  | ≤ 32.1   |         |                           | ≤ 32.1  |         |                           |   |           |                           |   |                |                           |
| Vc<br>(SFM)  | 80   | (64-96) |                           | 62  | (50-74) |                           | 215   | (172-258) |                           | 75  | (60-90)        |                           |
| Ae/Ap  | Ae=0.5D<br>Ap=1.5D   |         |                           | Ae=0.5D<br>Ap=1.5D  |         |                           | Ae=0.5D<br>Ap=1.5D  |           |                           | Ae=0.5D<br>Ap=1.5D  |                |                           |
| MILL DIA.<br>(inch)  | RPM  | Fz      | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz      | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz             | Feed<br>(IPM)<br>4 Flutes |
| 1/8  | 2,365  | 0.00020 | 1.9                       | 1,858   | 0.00010 | 0.70                      | 6,757   | 0.00020   | 5.4                       | 2,365   | 0.00020        | 1.9                       |
| 9/64   | 2,102  | 0.00023 | 1.9                       | 1,652   | 0.00013 | 0.80                      | 6,007   | 0.00024   | 5.7                       | 2,102   | 0.00024        | 2.0                       |
| 5/32   | 1,892  | 0.00025 | 1.9                       | 1,487   | 0.00015 | 0.90                      | 5,406   | 0.00028   | 5.9                       | 1,892   | 0.00028        | 2.1                       |
| 11/64  | 1,720  | 0.00028 | 1.9                       | 1,351   | 0.00018 | 0.90                      | 4,915   | 0.00031   | 6.1                       | 1,720   | 0.00031        | 2.2                       |
| 3/16   | 1,577  | 0.00030 | 1.9                       | 1,239   | 0.00020 | 1.00                      | 4,505   | 0.00035   | 6.3                       | 1,577   | 0.00035        | 2.2                       |
| 13/64  | 1,455  | 0.00033 | 1.9                       | 1,144   | 0.00023 | 1.00                      | 4,158   | 0.00039   | 6.4                       | 1,455   | 0.00039        | 2.3                       |
| 7/32   | 1,351  | 0.00035 | 1.9                       | 1,062   | 0.00025 | 1.10                      | 3,861   | 0.00043   | 6.6                       | 1,351   | 0.00043        | 2.3                       |
| 15/64  | 1,261  | 0.00038 | 1.9                       | 991   | 0.00028 | 1.10                      | 3,604   | 0.00046   | 6.7                       | 1,261   | 0.00046        | 2.3                       |
| 1/4  | 1,183  | 0.00040 | 1.9                       | 929   | 0.00030 | 1.10                      | 3,379   | 0.00050   | 6.8                       | 1,183   | 0.00050        | 2.4                       |
| 17/64  | 1,113  | 0.00045 | 2.0                       | 874   | 0.00033 | 1.10                      | 3,180   | 0.00057   | 7.2                       | 1,113   | 0.00057        | 2.5                       |
| 9/32   | 1,051  | 0.00050 | 2.1                       | 826   | 0.00035 | 1.20                      | 3,003   | 0.00063   | 7.6                       | 1,051   | 0.00063        | 2.6                       |
| 19/64  | 996  | 0.00055 | 2.2                       | 782   | 0.00038 | 1.20                      | 2,845   | 0.00069   | 7.8                       | 996   | 0.00069        | 2.7                       |
| 5/16   | 946  | 0.00060 | 2.3                       | 743   | 0.00040 | 1.20                      | 2,703   | 0.00075   | 8.1                       | 946   | 0.00075        | 2.8                       |
| 21/64  | 901  | 0.00065 | 2.3                       | 708   | 0.00043 | 1.20                      | 2,574   | 0.00081   | 8.4                       | 901   | 0.00081        | 2.9                       |
| 11/32  | 860  | 0.00070 | 2.4                       | 676   | 0.00045 | 1.20                      | 2,457   | 0.00088   | 8.6                       | 860   | 0.00088        | 3.0                       |
| 23/64  | 823  | 0.00075 | 2.5                       | 646   | 0.00048 | 1.20                      | 2,350   | 0.00094   | 8.8                       | 823   | 0.00094        | 3.1                       |
| 3/8  | 788  | 0.00080 | 2.5                       | 619   | 0.00050 | 1.20                      | 2,252   | 0.00100   | 9.0                       | 788   | 0.00100        | 3.2                       |
| 25/64  | 757  | 0.00083 | 2.5                       | 595   | 0.00053 | 1.20                      | 2,162   | 0.00104   | 9.0                       | 757   | 0.00104        | 3.1                       |
| 13/32  | 728  | 0.00085 | 2.5                       | 572   | 0.00055 | 1.30                      | 2,079   | 0.00108   | 8.9                       | 728   | 0.00108        | 3.1                       |
| 27/64  | 701  | 0.00088 | 2.5                       | 551   | 0.00058 | 1.30                      | 2,002   | 0.00111   | 8.9                       | 701   | 0.00111        | 3.1                       |
| 7/16   | 676  | 0.00090 | 2.4                       | 531   | 0.00060 | 1.30                      | 1,931   | 0.00115   | 8.9                       | 676   | 0.00115        | 3.1                       |
| 29/64  | 652  | 0.00093 | 2.4                       | 513   | 0.00063 | 1.30                      | 1,864   | 0.00119   | 8.9                       | 652   | 0.00119        | 3.1                       |
| 15/32  | 631  | 0.00095 | 2.4                       | 496   | 0.00065 | 1.30                      | 1,802   | 0.00123   | 8.8                       | 631   | 0.00123        | 3.1                       |
| 31/64  | 610  | 0.00098 | 2.4                       | 480   | 0.00068 | 1.30                      | 1,744   | 0.00126   | 8.8                       | 610   | 0.00126        | 3.1                       |
| 1/2  | 591  | 0.00100 | 2.4                       | 465   | 0.00070 | 1.30                      | 1,689   | 0.00130   | 8.8                       | 591   | 0.00130        | 3.1                       |
| 9/16   | 526  | 0.00115 | 2.4                       | 413   | 0.00080 | 1.30                      | 1,502   | 0.00145   | 8.7                       | 526   | 0.00145        | 3.0                       |
| 5/8  | 473  | 0.00130 | 2.5                       | 372   | 0.00090 | 1.30                      | 1,351   | 0.00160   | 8.6                       | 473   | 0.00160        | 3.0                       |
| 11/16  | 430  | 0.00135 | 2.3                       | 338   | 0.00095 | 1.30                      | 1,229   | 0.00165   | 8.1                       | 430   | 0.00165        | 2.8                       |
| 3/4  | 394  | 0.00140 | 2.2                       | 310   | 0.00100 | 1.20                      | 1,126   | 0.00170   | 7.7                       | 394   | 0.00170        | 2.7                       |
| 7/8  | 338  | 0.00145 | 2.0                       | 265   | 0.00011 | 0.10                      | 965   | 0.00175   | 6.8                       | 338   | 0.00175        | 2.4                       |
| 1  | 296  | 0.00150 | 1.8                       | 232   | 0.00110 | 1.00                      | 845   | 0.00180   | 6.1                       | 296   | 0.00180        | 2.1                       |

Depth of cut  
切削量基準



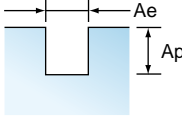
產品規格表 **P255**  
Specification page

## IPVE Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling        | CARBON STEELS<br>1018, 1040, 1080, 1090,<br>10L50, 1140, 1212, 12L15,<br>1525, 1536 |           |                           | ALLOY STEELS<br>4140, 4150, 4320, 5120,<br>5150, 8630, 86L20, 50100 |           |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |           |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |           |                           | TOOL STEELS<br>A2, D2, H13, L2, M2,<br>P20, S7, T15, W2 |         |                           |
|---------------------|---|-----------|---------------------------|---|-----------|---------------------------|---|-----------|---------------------------|---|-----------|---------------------------|---|---------|---------------------------|
| Hardness<br>BRINELL | ≦ 275   |           |                           | ≦ 375   |           |                           | ≦ 375   |           |                           | ≧ 375<br>≦ 475  |           |                           | ≧ 475<br>≦ 655  |         |                           |
| HRC                 | ≦ 28.5  |           |                           | ≦ 39.8  |           |                           | ≦ 39.8  |           |                           | ≧ 39.8<br>≦ 49.1  |           |                           | ≧ 50<br>≦ 65  |         |                           |
| Vc<br>(SFM)         | 440   | (352-528) |                           | 252   | (201-303) |                           | 320   | (256-384) |                           | 170   | (136-204) |                           | 70  | (56-84) |                           |
| Ae/Ap               | Ae=1D<br>Ap=1D  |           |                           | Ae=1D<br>Ap=1D  |           |                           | Ae=1D<br>Ap=1D  |           |                           | Ae=1D<br>Ap=1D  |           |                           | Ae=1D<br>Ap=1D  |         |                           |
| MILL DIA.<br>(inch) | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz        | Feed<br>(IPM)<br>4 Flutes | RPM   | Fz      | Feed<br>(IPM)<br>4 Flutes |
| 1/8                 | 13,515  | 0.00040   | 21.6                      | 6,163   | 0.00030   | 7.40                      | 9,866   | 0.00050   | 19.7                      | 5,136   | 0.00040   | 8.2                       | 2,162   | 0.00020 | 1.7                       |
| 9/64                | 12,013  | 0.00048   | 22.8                      | 5,478   | 0.00028   | 6.03                      | 8,770   | 0.00059   | 20.6                      | 4,565   | 0.00048   | 8.7                       | 1,922   | 0.00024 | 1.8                       |
| 5/32                | 10,812  | 0.00055   | 23.8                      | 4,930   | 0.00035   | 6.90                      | 7,893   | 0.00068   | 21.3                      | 4,109   | 0.00055   | 9.0                       | 1,730   | 0.00028 | 1.9                       |
| 11/64               | 9,829   | 0.00063   | 24.6                      | 4,482   | 0.00043   | 7.62                      | 7,175   | 0.00076   | 21.9                      | 3,735   | 0.00063   | 9.3                       | 1,573   | 0.00031 | 2.0                       |
| 3/16                | 9,010   | 0.00070   | 25.2                      | 4,109   | 0.00050   | 8.22                      | 6,577   | 0.00085   | 22.4                      | 3,424   | 0.00070   | 9.6                       | 1,442   | 0.00035 | 2.0                       |
| 13/64               | 8,317   | 0.00078   | 25.8                      | 3,793   | 0.00058   | 8.72                      | 6,071   | 0.00094   | 22.8                      | 3,160   | 0.00078   | 9.8                       | 1,331   | 0.00039 | 2.1                       |
| 7/32                | 7,723   | 0.00085   | 26.3                      | 3,522   | 0.00065   | 9.16                      | 5,638   | 0.00103   | 23.1                      | 2,935   | 0.00085   | 10.0                      | 1,236   | 0.00043 | 2.1                       |
| 15/64               | 7,208   | 0.00093   | 26.7                      | 3,287   | 0.00073   | 9.53                      | 5,262   | 0.00111   | 23.4                      | 2,739   | 0.00093   | 10.1                      | 1,153   | 0.00046 | 2.1                       |
| 1/4                 | 6,757   | 0.00100   | 27.0                      | 3,081   | 0.00080   | 9.86                      | 4,933   | 0.00120   | 23.7                      | 2,568   | 0.00100   | 1.0                       | 1,081   | 0.00050 | 2.2                       |
| 17/64               | 6,360   | 0.00113   | 28.6                      | 2,900   | 0.00088   | 10.15                     | 4,643   | 0.00134   | 24.8                      | 2,417   | 0.00113   | 10.9                      | 1,018   | 0.00056 | 2.3                       |
| 9/32                | 6,007   | 0.00123   | 29.6                      | 2,739   | 0.00095   | 10.41                     | 4,385   | 0.00148   | 25.9                      | 2,283   | 0.00123   | 11.2                      | 961   | 0.00061 | 2.4                       |
| 19/64               | 5,691   | 0.00134   | 30.5                      | 2,595   | 0.00103   | 10.64                     | 4,154   | 0.00161   | 26.8                      | 2,162   | 0.00134   | 11.6                      | 910   | 0.00067 | 2.4                       |
| 5/16                | 5,406   | 0.00145   | 31.4                      | 2,465   | 0.00110   | 10.85                     | 3,946   | 0.00175   | 27.6                      | 2,054   | 0.00145   | 11.9                      | 865   | 0.00073 | 2.5                       |
| 21/64               | 5,149   | 0.00156   | 32.1                      | 2,348   | 0.00118   | 11.03                     | 3,758   | 0.00189   | 28.4                      | 1,956   | 0.00156   | 12.2                      | 824   | 0.00078 | 2.6                       |
| 11/32               | 4,915   | 0.00168   | 33.0                      | 2,241   | 0.00125   | 11.21                     | 3,588   | 0.00203   | 29.1                      | 1,868   | 0.00168   | 12.5                      | 786   | 0.00084 | 2.6                       |
| 23/64               | 4,701   | 0.00178   | 33.5                      | 2,144   | 0.00133   | 11.36                     | 3,432   | 0.00216   | 29.7                      | 1,786   | 0.00178   | 12.8                      | 752   | 0.00089 | 2.7                       |
| 3/8                 | 4,505   | 0.00190   | 34.2                      | 2,054   | 0.00140   | 11.50                     | 3,289   | 0.00230   | 30.3                      | 1,712   | 0.00190   | 13.0                      | 721   | 0.00095 | 2.7                       |
| 25/64               | 4,325   | 0.00198   | 34.2                      | 1,972   | 0.00146   | 11.54                     | 3,157   | 0.00239   | 30.2                      | 1,643   | 0.00198   | 13.0                      | 692   | 0.00099 | 2.7                       |
| 13/32               | 4,158   | 0.00205   | 34.1                      | 1,896   | 0.00153   | 11.57                     | 3,036   | 0.00248   | 30.1                      | 1,580   | 0.00205   | 13.0                      | 665   | 0.00103 | 2.7                       |
| 27/64               | 4,004   | 0.00213   | 34.0                      | 1,826   | 0.00159   | 11.60                     | 2,923   | 0.00256   | 30.0                      | 1,522   | 0.00213   | 12.9                      | 641   | 0.00106 | 2.7                       |
| 7/16                | 3,861   | 0.00220   | 34.0                      | 1,761   | 0.00165   | 11.62                     | 2,819   | 0.00265   | 29.9                      | 1,467   | 0.00220   | 12.9                      | 618   | 0.00110 | 2.7                       |
| 29/64               | 3,728   | 0.00228   | 33.9                      | 1,700   | 0.00171   | 11.65                     | 2,722   | 0.00274   | 29.8                      | 1,417   | 0.00228   | 12.9                      | 597   | 0.00114 | 2.7                       |
| 15/32               | 3,604   | 0.00235   | 33.9                      | 1,643   | 0.00178   | 11.67                     | 2,631   | 0.00283   | 29.7                      | 1,370   | 0.00235   | 12.9                      | 577   | 0.00118 | 2.7                       |
| 31/64               | 3,488   | 0.00243   | 33.8                      | 1,590   | 0.00184   | 11.69                     | 2,546   | 0.00291   | 29.6                      | 1,325   | 0.00243   | 12.9                      | 558   | 0.00121 | 2.7                       |
| 1/2                 | 3,379   | 0.00250   | 33.8                      | 1,541   | 0.00190   | 11.71                     | 2,466   | 0.00300   | 29.6                      | 1,284   | 0.00250   | 12.8                      | 541   | 0.00125 | 2.7                       |
| 9/16                | 3,003   | 0.00210   | 25.2                      | 1,370   | 0.00215   | 11.78                     | 2,192   | 0.00345   | 30.3                      | 1,141   | 0.00285   | 13.0                      | 481   | 0.00143 | 2.7                       |
| 5/8                 | 2,703   | 0.00310   | 33.5                      | 1,233   | 0.00240   | 11.83                     | 1,973   | 0.00390   | 30.8                      | 1,027   | 0.00320   | 13.1                      | 432   | 0.00160 | 2.8                       |
| 11/16               | 2,457   | 0.00315   | 31.0                      | 1,121   | 0.00245   | 10.98                     | 1,794   | 0.00405   | 29.1                      | 934   | 0.00335   | 12.5                      | 393   | 0.00168 | 2.6                       |
| 3/4                 | 2,252   | 0.00320   | 28.8                      | 1,027   | 0.00250   | 10.27                     | 1,644   | 0.00420   | 27.6                      | 856   | 0.00350   | 12.0                      | 360   | 0.00175 | 2.5                       |
| 7/8                 | 1,931   | 0.00335   | 25.9                      | 880   | 0.00260   | 9.16                      | 1,409   | 0.00460   | 25.9                      | 734   | 0.00365   | 10.7                      | 309   | 0.00183 | 2.3                       |
| 1                   | 1,689   | 0.00350   | 23.7                      | 770   | 0.00270   | 8.32                      | 1,233   | 0.00500   | 24.7                      | 642   | 0.00380   | 9.8                       | 270   | 0.00190 | 2.1                       |

Depth of cut  
切削量基準



產品規格表 **P255**  
Specification page

## IPVE Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling<br> | CAST IRONS (LOW&MEDIUM ALLOY)<br>Gray, Malleable, Ductile |           |                        | CAST IRONS (HIGH ALLOY)<br>Gray, Malleable, Ductile |                |                        | STAINLESS STEELS (FREE MACHINING)<br>304, 416, 420F, 430F, 440F |           |                        | STAINLESS STEELS (DIFFICULT)<br>304, 304L, 316, 316L |           |                        | STAINLESS STEELS(PH)<br>13-8 PH, 15-5PH, 17-4PH, Custom 450 |           |                        |
|---|---|-----------|------------------------|---|----------------|------------------------|---|-----------|------------------------|--|-----------|------------------------|---|-----------|------------------------|
|   | Hardness BRINELL  | ≤ 220     |                        |   | ≥ 220<br>≤ 260 |                        |   | ≤ 275     |                        |  | ≤ 275     |                        |   | ≤ 325     |                        |
| HRC   | ≤ 18.8  |           |                        | ≥ 18.8<br>≤ 26.6                                    |                |                        | ≤ 28.5  |           |                        | ≤ 28.5   |           |                        | ≤ 34.4  |           |                        |
| Vc (SFM)  | 284   | (356-534) |                        | 272   | (216-324)      |                        | 390   | (312-468) |                        | 270  | (216-324) |                        | 250   | (200-300) |                        |
| Ae/Ap   | Ae=1D<br>Ap=1D  |           |                        | Ae=1D<br>Ap=1D                                      |                |                        | Ae=1D<br>Ap=1D  |           |                        | Ae=1D<br>Ap=1D                                       |           |                        | Ae=1D<br>Ap=1D  |           |                        |
| MILL DIA. (inch)  | RPM   | Fz        | Feed (IPM)<br>4 Flutes | RPM   | Fz             | Feed (IPM)<br>4 Flutes | RPM   | Fz        | Feed (IPM)<br>4 Flutes | RPM  | Fz        | Feed (IPM)<br>4 Flutes | RPM   | Fz        | Feed (IPM)<br>4 Flutes |
| 1/8   | 6,920   | 0.00040   | 11.1                   | 6,595   | 0.00030        | 7.90                   | 9,515   | 0.00030   | 11.4                   | 6,595  | 0.00020   | 5.3                    | 6,055   | 0.00020   | 4.8                    |
| 9/64  | 6,151   | 0.00048   | 11.7                   | 5,862   | 0.00035        | 8.20                   | 8,457   | 0.00035   | 11.8                   | 5,862  | 0.00025   | 5.9                    | 5,382   | 0.00025   | 5.4                    |
| 5/32  | 5,536   | 0.00055   | 12.2                   | 5,276   | 0.00040        | 8.40                   | 7,612   | 0.00040   | 12.2                   | 5,276  | 0.00030   | 6.3                    | 4,844   | 0.00030   | 5.8                    |
| 11/64   | 5,032   | 0.00063   | 12.6                   | 4,797   | 0.00045        | 8.60                   | 6,920   | 0.00045   | 12.5                   | 4,797  | 0.00035   | 6.7                    | 4,403   | 0.00035   | 6.2                    |
| 3/16  | 4,613   | 0.00070   | 12.9                   | 4,397   | 0.00050        | 8.80                   | 6,343   | 0.00050   | 12.7                   | 4,397  | 0.00040   | 7.0                    | 4,036   | 0.00040   | 6.5                    |
| 13/64   | 4,258   | 0.00078   | 13.2                   | 4,059   | 0.00055        | 8.90                   | 5,855   | 0.00055   | 12.9                   | 4,059  | 0.00045   | 7.3                    | 3,726   | 0.00045   | 6.7                    |
| 7/32  | 3,954   | 0.00085   | 13.4                   | 3,769   | 0.00060        | 9.00                   | 5,437   | 0.00060   | 13.0                   | 3,769  | 0.00050   | 7.5                    | 3,460   | 0.00050   | 6.9                    |
| 15/64   | 3,690   | 0.00093   | 13.7                   | 3,517   | 0.00065        | 9.10                   | 5,074   | 0.00065   | 13.2                   | 3,517  | 0.00055   | 7.7                    | 3,229   | 0.00055   | 7.1                    |
| 1/4   | 3,460   | 0.00100   | 13.8                   | 3,298   | 0.00070        | 9.20                   | 4,757   | 0.00070   | 13.3                   | 3,298  | 0.00060   | 7.9                    | 3,027   | 0.00060   | 7.3                    |
| 17/64   | 3,256   | 0.00110   | 14.3                   | 3,104   | 0.00079        | 9.80                   | 4,477   | 0.00079   | 14.1                   | 3,104  | 0.00066   | 8.2                    | 2,849   | 0.00066   | 7.6                    |
| 9/32  | 3,075   | 0.00120   | 14.8                   | 2,931   | 0.00088        | 10.30                  | 4,229   | 0.00088   | 14.8                   | 2,931  | 0.00073   | 8.5                    | 2,691   | 0.00073   | 7.8                    |
| 19/64   | 2,914   | 0.00130   | 15.2                   | 2,777   | 0.00096        | 10.70                  | 4,006   | 0.00096   | 15.4                   | 2,777  | 0.00079   | 8.7                    | 2,549   | 0.00079   | 8.0                    |
| 5/16  | 2,768   | 0.00140   | 15.5                   | 2,638   | 0.00105        | 11.10                  | 3,806   | 0.00105   | 16.0                   | 2,638  | 0.00085   | 9.0                    | 2,422   | 0.00085   | 8.2                    |
| 21/64   | 2,636   | 0.00150   | 15.8                   | 2,512   | 0.00114        | 11.40                  | 3,625   | 0.00114   | 16.5                   | 2,512  | 0.00091   | 9.2                    | 2,307   | 0.00091   | 8.4                    |
| 11/32   | 2,516   | 0.00160   | 16.1                   | 2,398   | 0.00123        | 11.80                  | 3,460   | 0.00123   | 17.0                   | 2,398  | 0.00098   | 9.4                    | 2,202   | 0.00098   | 8.6                    |
| 23/64   | 2,407   | 0.00170   | 16.4                   | 2,294   | 0.00131        | 12.00                  | 3,309   | 0.00131   | 17.4                   | 2,294  | 0.00104   | 9.5                    | 2,106   | 0.00104   | 8.7                    |
| 3/8   | 2,307   | 0.00180   | 16.6                   | 2,198   | 0.00140        | 12.30                  | 3,172   | 0.00140   | 17.8                   | 2,198  | 0.00110   | 9.7                    | 2,018   | 0.00110   | 8.9                    |
| 25/64   | 2,214   | 0.00188   | 16.6                   | 2,110   | 0.00145        | 12.20                  | 3,045   | 0.00145   | 17.7                   | 2,110  | 0.00114   | 9.6                    | 1,938   | 0.00114   | 8.8                    |
| 13/32   | 2,129   | 0.00195   | 16.6                   | 2,029   | 0.00150        | 12.20                  | 2,928   | 0.00150   | 17.6                   | 2,029  | 0.00118   | 9.5                    | 1,863   | 0.00118   | 8.8                    |
| 27/64   | 2,050   | 0.00203   | 16.6                   | 1,954   | 0.00155        | 12.10                  | 2,819   | 0.00155   | 17.5                   | 1,954  | 0.00121   | 9.5                    | 1,794   | 0.00121   | 8.7                    |
| 7/16  | 1,977   | 0.00210   | 16.6                   | 1,884   | 0.00160        | 12.10                  | 2,718   | 0.00160   | 17.4                   | 1,884  | 0.00125   | 9.4                    | 1,730   | 0.00125   | 8.6                    |
| 29/64   | 1,909   | 0.00218   | 16.6                   | 1,819   | 0.00165        | 12.00                  | 2,625   | 0.00165   | 17.3                   | 1,819  | 0.0013    | 0.9                    | 1,670   | 0.0013    | 0.9                    |
| 15/32   | 1,845   | 0.00225   | 16.6                   | 1,759   | 0.00170        | 12.00                  | 2,537   | 0.00170   | 17.3                   | 1,759  | 0.00133   | 9.3                    | 1,615   | 0.00133   | 8.6                    |
| 31/64   | 1,786   | 0.00233   | 16.6                   | 1,702   | 0.00175        | 11.90                  | 2,455   | 0.00175   | 17.2                   | 1,702  | 0.00136   | 9.3                    | 1,563   | 0.00136   | 8.5                    |
| 1/2   | 1,730   | 0.00240   | 16.6                   | 1,649   | 0.00180        | 11.90                  | 2,379   | 0.00180   | 17.1                   | 1,649  | 0.00140   | 9.2                    | 1,514   | 0.00140   | 8.5                    |
| 9/16  | 1,538   | 0.00270   | 16.6                   | 1,466   | 0.00205        | 12.00                  | 2,114   | 0.00205   | 17.3                   | 1,466  | 0.00160   | 9.4                    | 1,345   | 0.00160   | 8.6                    |
| 5/8   | 1,384   | 0.00300   | 16.6                   | 1,319   | 0.00230        | 12.10                  | 1,903   | 0.00230   | 17.5                   | 1,319  | 0.00180   | 9.5                    | 1,211   | 0.00180   | 8.7                    |
| 11/16   | 1,258   | 0.00305   | 15.3                   | 1,199   | 0.00245        | 11.80                  | 1,730   | 0.00245   | 17.0                   | 1,199  | 0.00185   | 8.9                    | 1,101   | 0.00185   | 8.1                    |
| 3/4   | 1,153   | 0.00310   | 14.3                   | 1,099   | 0.00240        | 10.60                  | 1,586   | 0.00240   | 15.2                   | 1,099  | 0.00190   | 8.4                    | 1,009   | 0.00190   | 7.7                    |
| 7/8   | 989   | 0.00325   | 12.9                   | 942   | 0.00245        | 9.20                   | 1,359   | 0.00245   | 13.3                   | 942  | 0.00195   | 7.3                    | 865   | 0.00195   | 6.7                    |
| 1   | 865   | 0.00340   | 11.8                   | 824   | 0.00250        | 8.20                   | 1,189   | 0.00250   | 11.9                   | 824  | 0.00200   | 6.6                    | 757   | 0.00200   | 6.1                    |

Depth of cut  
切削量基準






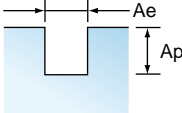
產品規格表 **P255**  
Specification page

## IPVE Series SLOT CUTTING 溝加工

**FRACTIONAL 英制**

| Slot Milling<br> | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 601, 617, 625, Incoloy 800, Monel 400 |         |                        | SUPER ALLOYS<br>(NICKEL, COBALT, IRON, BASE)<br>Inconel 718, 750X, Incoloy 925, Waspalloy, Hastelloy, Rene |         |                        | TITANIUM ALLOYS<br>Pure Titanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si |           |                        | TITANIUM ALLOYS<br>(DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3Cr3Sn3Al |         |                        |
|---|---|---------|------------------------|--|---------|------------------------|---|-----------|------------------------|---|---------|------------------------|
|   | Hardness BRINELL<br>$\leq 300$  |         |                        | $> 300$  |         |                        | $\leq 350$  |           |                        | $> 350$<br>$\leq 440$   |         |                        |
| HRC   | $\leq 32.1$   |         |                        | $\leq 32.1$  |         |                        |   |           |                        |   |         |                        |
| Vc (SFM)  | 65  | (52-78) |                        | 50   | (40-60) |                        | 170   | (136-204) |                        | 60  | (48-72) |                        |
| Ae/Ap   | Ae=1D<br>Ap=1D  |         |                        | Ae=1D<br>Ap=1D   |         |                        | Ae=1D<br>Ap=1D  |           |                        | Ae=1D<br>Ap=1D  |         |                        |
| MILL DIA. (inch)  | RPM   | Fz      | Feed (IPM)<br>4 Flutes | RPM  | Fz      | Feed (IPM)<br>4 Flutes | RPM   | Fz        | Feed (IPM)<br>4 Flutes | RPM   | Fz      | Feed (IPM)<br>4 Flutes |
| 1/8   | 1,514   | 0.00020 | 1.2                    | 1,189  | 0.00010 | 0.50                   | 4,325   | 0.00020   | 3.5                    | 1,514   | 0.00020 | 1.2                    |
| 9/64  | 1,345   | 0.00023 | 1.2                    | 1,057  | 0.00013 | 0.50                   | 3,844   | 0.00024   | 3.7                    | 1,345   | 0.00024 | 1.3                    |
| 5/32  | 1,211   | 0.00025 | 1.2                    | 951  | 0.00015 | 0.60                   | 3,460   | 0.00028   | 3.8                    | 1,211   | 0.00028 | 1.3                    |
| 11/64   | 1,101   | 0.00028 | 1.2                    | 865  | 0.00018 | 0.60                   | 3,145   | 0.00031   | 3.9                    | 1,101   | 0.00031 | 1.4                    |
| 3/16  | 1,009   | 0.00030 | 1.2                    | 793  | 0.00020 | 0.60                   | 2,883   | 0.00035   | 4.0                    | 1,009   | 0.00035 | 1.4                    |
| 13/64   | 931   | 0.00033 | 1.2                    | 732  | 0.00023 | 0.70                   | 2,661   | 0.00039   | 4.1                    | 931   | 0.00039 | 1.4                    |
| 7/32  | 865   | 0.00035 | 1.2                    | 680  | 0.00025 | 0.70                   | 2,471   | 0.00043   | 4.2                    | 865   | 0.00043 | 1.5                    |
| 15/64   | 807   | 0.00038 | 1.2                    | 634  | 0.00028 | 0.70                   | 2,307   | 0.00046   | 4.3                    | 807   | 0.00046 | 1.5                    |
| 1/4   | 757   | 0.00040 | 1.2                    | 595  | 0.00030 | 0.70                   | 2,162   | 0.00050   | 4.3                    | 757   | 0.00050 | 1.5                    |
| 17/64   | 712   | 0.00045 | 1.3                    | 560  | 0.00033 | 0.70                   | 2,035   | 0.00057   | 4.6                    | 712   | 0.00057 | 1.6                    |
| 9/32  | 673   | 0.00050 | 1.3                    | 529  | 0.00035 | 0.70                   | 1,922   | 0.00063   | 4.8                    | 673   | 0.00063 | 1.7                    |
| 19/64   | 637   | 0.00055 | 1.4                    | 501  | 0.00038 | 0.80                   | 1,821   | 0.00069   | 5.0                    | 637   | 0.00069 | 1.8                    |
| 5/16  | 605   | 0.00060 | 1.5                    | 476  | 0.00040 | 0.80                   | 1,730   | 0.00075   | 5.2                    | 605   | 0.00075 | 1.8                    |
| 21/64   | 577   | 0.00065 | 1.5                    | 453  | 0.00043 | 0.80                   | 1,648   | 0.00081   | 5.4                    | 577   | 0.00081 | 1.9                    |
| 11/32   | 550   | 0.00070 | 1.5                    | 432  | 0.00045 | 0.80                   | 1,573   | 0.00088   | 5.5                    | 550   | 0.00088 | 1.9                    |
| 23/64   | 526   | 0.00075 | 1.6                    | 414  | 0.00048 | 0.80                   | 1,504   | 0.00094   | 5.6                    | 526   | 0.00094 | 2.0                    |
| 3/8   | 505   | 0.00080 | 1.6                    | 396  | 0.00050 | 0.80                   | 1,442   | 0.00100   | 5.8                    | 505   | 0.00100 | 2.0                    |
| 25/64   | 484   | 0.00083 | 1.6                    | 381  | 0.00053 | 0.80                   | 1,384   | 0.00104   | 5.7                    | 484   | 0.00104 | 2.0                    |
| 13/32   | 466   | 0.00085 | 1.6                    | 366  | 0.00055 | 0.80                   | 1,331   | 0.00108   | 5.7                    | 466   | 0.00108 | 2.0                    |
| 27/64   | 448   | 0.00088 | 1.6                    | 352  | 0.00058 | 0.80                   | 1,281   | 0.00111   | 5.7                    | 448   | 0.00111 | 2.0                    |
| 7/16  | 432   | 0.00090 | 1.6                    | 340  | 0.00060 | 0.80                   | 1,236   | 0.00115   | 5.7                    | 432   | 0.00115 | 2.0                    |
| 29/64   | 418   | 0.00093 | 1.5                    | 328  | 0.00063 | 0.80                   | 1,193   | 0.00119   | 5.7                    | 418   | 0.00119 | 2.0                    |
| 15/32   | 404   | 0.00095 | 1.5                    | 317  | 0.00065 | 0.80                   | 1,153   | 0.00123   | 5.7                    | 404   | 0.00123 | 2.0                    |
| 31/64   | 391   | 0.00098 | 1.5                    | 307  | 0.00068 | 0.80                   | 1,116   | 0.00126   | 5.6                    | 391   | 0.00126 | 2.0                    |
| 1/2   | 378   | 0.00100 | 1.5                    | 297  | 0.00070 | 0.80                   | 1,081   | 0.00130   | 5.6                    | 378   | 0.00130 | 2.0                    |
| 9/16  | 336   | 0.00115 | 1.5                    | 264  | 0.00080 | 0.80                   | 961   | 0.00145   | 5.6                    | 336   | 0.00145 | 2.0                    |
| 5/8   | 303   | 0.00130 | 1.6                    | 238  | 0.00090 | 0.90                   | 865   | 0.00160   | 5.5                    | 303   | 0.00160 | 1.9                    |
| 11/16   | 275   | 0.00135 | 1.5                    | 216  | 0.00095 | 0.80                   | 786   | 0.00165   | 5.2                    | 275   | 0.00165 | 1.8                    |
| 3/4   | 252   | 0.00140 | 1.4                    | 198  | 0.00100 | 0.80                   | 721   | 0.00170   | 4.9                    | 252   | 0.00170 | 1.7                    |
| 7/8   | 216   | 0.00145 | 1.3                    | 170  | 0.00011 | 0.10                   | 618   | 0.00175   | 4.3                    | 216   | 0.00175 | 1.5                    |
| 1   | 189   | 0.00150 | 1.1                    | 149  | 0.00110 | 0.70                   | 541   | 0.00180   | 3.9                    | 189   | 0.00180 | 1.4                    |


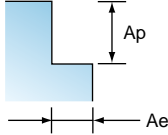
Depth of cut  
切削量基準


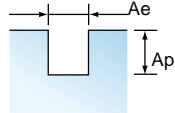


產品規格表 **P256**  
Specification page

### IPVR1T Series Cutting Conditions 標準切削

**FRACTIONAL 英制**

| type  |  | IPVR1T |                     |  |
|---|--|--------|---------------------|--|
| Side Milling<br> | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |        |                     |  |
| Hardness BRINELL  | ≅ 300  |        |                     |  |
| HRC   | ≅ 31   |        |                     |  |
| Vc (SFM)  | 60   |        |                     |  |
| Ae/Ap   | Ae=0.4D<br>Ap=1.5D   |        |                     |  |
| MILL DIA. (inch)  | RPM  | Fz     | Feed (IPM) 4 Flutes |  |
| 1/8   | 5,014  | 0.0005 | 9.4                 |  |
| 3/16  | 3,345  | 0.0007 | 10.0                |  |
| 1/4   | 2,507  | 0.0008 | 8.4                 |  |
| 5/16  | 2,008  | 0.0010 | 7.8                 |  |
| 3/8   | 1,671  | 0.0013 | 8.8                 |  |
| 1/2   | 1,254  | 0.0017 | 8.4                 |  |
| 5/8   | 1,008  | 0.0019 | 7.8                 |  |
| 3/4   | 836  | 0.0023 | 7.5                 |  |
| Depth of cut<br>切削量基準   |                          |        |                     |  |

| type  |  | IPVR1T |                     |  |
|---|--|--------|---------------------|--|
| Slot Milling<br> | TITANIUM ALLOYS (DIFFICULT)<br>Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 |        |                     |  |
| Hardness BRINELL  | ≅ 300  |        |                     |  |
| HRC   | ≅ 31   |        |                     |  |
| Vc (SFM)  | 60   |        |                     |  |
| Ae/Ap   | Ae=1D<br>Ap=1.25D  |        |                     |  |
| MILL DIA. (inch)  | RPM  | Fz     | Feed (IPM) 4 Flutes |  |
| 1/8   | 4,013  | 0.0003 | 5.0                 |  |
| 3/16  | 2,676  | 0.0006 | 6.0                 |  |
| 1/4   | 2,006  | 0.0008 | 6.7                 |  |
| 5/16  | 1,607  | 0.0010 | 6.3                 |  |
| 3/8   | 1,338  | 0.0011 | 6.0                 |  |
| 1/2   | 1,003  | 0.0017 | 6.7                 |  |
| 5/8   | 806  | 0.0017 | 5.6                 |  |
| 3/4   | 669  | 0.0021 | 5.5                 |  |
| Depth of cut<br>切削量基準   |                        |        |                     |  |

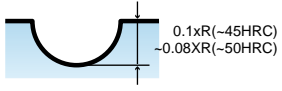
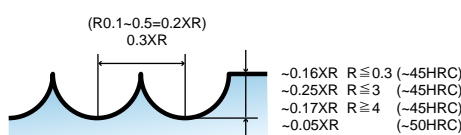
產品規格表 **P269**

Specification page

### ● SBS 4 Flutes Standard Cutting Conditons 標準切削

| WORK MATERIAL<br>被切削材 | Carbon Steels S50C<br>碳素鋼            |                               | Alloy Steels<br>Prehardened Steels<br>SCM SKD HPM NAK<br>合金鋼、調質鋼 |                               | Hardened Steels<br>SKD61~HRC50<br>調質鋼 |                               | Aluminum<br>鋁                        |                               | Copper<br>銅                          |                               |
|-----------------------|--------------------------------------|-------------------------------|--|-------------------------------|---------------------------------------|-------------------------------|--------------------------------------|-------------------------------|--------------------------------------|-------------------------------|
| Cutting Speed<br>切削速度 | 150m/min                             |                               | 120~150m/min   |                               | 80~100m/min                           |                               | 150~m/min                            |                               | 100~150m/min                         |                               |
| R                     | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速                             | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速  | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 | SPEED<br>(min <sup>-1</sup> )<br>迴轉速 | Feed Rate<br>(mm/min)<br>進給速度 |
| D0.15R                | 40,000                               | 800                           | 40,000   | 720                           | 40,000                                | 660                           | 40,000                               | 880                           | 40,000                               | 800                           |
| D0.2R                 | 40,000                               | 1,000                         | 40,000   | 960                           | 40,000                                | 1,000                         | 40,000                               | 960                           | 40,000                               | 960                           |
| D0.25R                | 40,000                               | 1,240                         | 40,000   | 1,220                         | 40,000                                | 1,240                         | 40,000                               | 1,080                         | 40,000                               | 1,080                         |
| D0.3R                 | 40,000                               | 1,500                         | 40,000   | 1,500                         | 40,000                                | 1,500                         | 40,000                               | 1,200                         | 40,000                               | 1,200                         |
| D0.4R                 | 40,000                               | 1,920                         | 40,000   | 2,000                         | 36,000                                | 1,800                         | 40,000                               | 1,600                         | 40,000                               | 1,600                         |
| D0.5R                 | 40,000                               | 2,400                         | 38,000   | 2,400                         | 29,000                                | 1,800                         | 40,000                               | 2,000                         | 40,000                               | 1,660                         |
| D0.75R                | 30,000                               | 2,540                         | 25,500   | 2,200                         | 19,000                                | 1,400                         | 40,000                               | 2,720                         | 30,000                               | 2,320                         |
| D1R                   | 24,000                               | 2,320                         | 19,000   | 1,600                         | 14,300                                | 1,200                         | 40,000                               | 4,000                         | 24,000                               | 2,400                         |
| D1.25R                | 19,000                               | 2,000                         | 15,300   | 1,340                         | 11,500                                | 1,020                         | 38,000                               | 4,800                         | 19,000                               | 2,400                         |
| D1.5R                 | 16,000                               | 1,860                         | 13,000   | 1,200                         | 9,600                                 | 920                           | 32,000                               | 4,800                         | 16,000                               | 2,400                         |
| D1.75R                | 13,700                               | 1,860                         | 11,400   | 1,160                         | 8,200                                 | 900                           | 27,300                               | 4,800                         | 13,600                               | 2,400                         |
| D2R                   | 12,000                               | 1,860                         | 10,000   | 1,140                         | 7,200                                 | 900                           | 24,000                               | 4,800                         | 12,000                               | 2,400                         |
| D2.5R                 | 9,600                                | 1,860                         | 8,000  | 1,120                         | 5,700                                 | 900                           | 19,000                               | 4,800                         | 9,600                                | 2,400                         |
| D3R                   | 8,000                                | 1,860                         | 6,400  | 1,080                         | 4,800                                 | 900                           | 16,000                               | 4,800                         | 8,000                                | 2,400                         |
| D4R                   | 6,000                                | 1,800                         | 4,800  | 1,080                         | 3,600                                 | 900                           | 12,000                               | 4,800                         | 6,000                                | 2,400                         |
| D5R                   | 4,800                                | 1,800                         | 3,800  | 1,080                         | 2,900                                 | 900                           | 9,600                                | 4,600                         | 4,800                                | 2,300                         |
| D6R                   | 4,000                                | 1,800                         | 3,200  | 1,080                         | 2,400                                 | 900                           | 8,000                                | 4,200                         | 4,000                                | 2,100                         |
| D7R                   | 3,400                                | 1,800                         | 2,750  | 1,080                         | 2,050                                 | 900                           | 6,800                                | 4,000                         | 3,400                                | 2,000                         |
| D8R                   | 3,000                                | 1,800                         | 2,400  | 1,080                         | 1,800                                 | 900                           | 6,000                                | 4,000                         | 3,000                                | 2,000                         |
| D10R                  | 2,400                                | 1,800                         | 1,900  | 1,040                         | 1,450                                 | 900                           | 4,800                                | 4,000                         | 2,400                                | 2,000                         |
| D12.5R                | 1,900                                | 1,440                         | 1,520  | 900                           | 1,160                                 | 420                           | 3,840                                | 3,800                         | 1,920                                | 940                           |

|                      |   |  |
|----------------------|---|--|
| DEPTH OF CUT<br>加工深度 |  |  |
|----------------------|---|--|

產品規格表 **P270**  
Specification page

## ● RTAS 2 Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材               | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AiSi 1049, Cast iron<br>炭素鋼、合金鋼-HRC30 |                            |               | Alloy Steels, Tool Steels<br>調質鋼SKD61, NAK等<br>Prehardened steels, AiSi H13<br>合金鋼、工具鋼、預硬鋼 HRC30~45 |                            |               | Austenitic stainless steels<br>SUS304, SUS316等<br>AiSi 304, AiSi 316<br>沃斯田鐵系列不鏽鋼 |                            |               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AiSi H13<br>熱處理鋼 (HRC45~50) |                            |               |
|------------------------------------|---|----------------------------|---------------|---|----------------------------|---------------|---|----------------------------|---------------|--|----------------------------|---------------|
| Cutting Speed<br>切削速度              | 50~100m/min   |                            |               | 50~70m/min  |                            |               | 30~60m/min  |                            |               | 20~40m/min   |                            |               |
| Diameter<br>直徑(mm)                 | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               |
|                                    |   | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |
| 8                                  | 4000  | 450                        | 360           | 2400  | 240                        | 190           | 1600  | 220                        | 130           | 1200   | 65                         | 50            |
| 10                                 | 3200  | 390                        | 310           | 1900  | 190                        | 150           | 1300  | 190                        | 110           | 1000   | 65                         | 50            |
| 12                                 | 2700  | 330                        | 260           | 1600  | 160                        | 130           | 1000  | 150                        | 90            | 800  | 65                         | 50            |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 |   |                            |               |   |                            |               |   |                            |               |  |                            |               |

產品規格表 **P270**  
Specification page

## ● RTAS 2 Flutes High-Speed Milling Conditions 高速標準切削

| Work material<br>被削材                | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AiSi 1049, Castiron<br>炭素鋼、合金鋼-HRC30 |                            | Alloy Steels, Tool Steels<br>調質鋼SKD61, NAK等<br>Prehardened steels, AiSi H13<br>合金鋼、工具鋼、預硬鋼 HRC30~45 |                            | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AiSi H13<br>熱處理鋼 HRC45~55 |                            |
|-------------------------------------|--|----------------------------|---|----------------------------|--|----------------------------|
| Cutting Speed<br>切削速度               | 250m/min   |                            | 150m/min  |                            | 100m/min   |                            |
| Diameter<br>直徑(mm)                  | Speed (min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |
|                                     |  |                            |   |                            |  |                            |
| 10                                  | 7900   | 1100                       | 4800  | 650                        | 3200   | 200                        |
| 12                                  | 6600   | 1000                       | 4000  | 560                        | 2600   | 200                        |
| (mm) Ap<br>Milling Amount<br>軸方向切削量 | Ap=0.05D   |                            | Ap=0.03D  |                            | Ap=0.02D   |                            |

### ▲ Caution

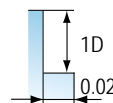
1. Please use SI coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

### ▲ 注意事項

1. 切削50~60HRC以上之材料時，請使用Si鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
3. 機械設備或工作的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表1/3以下。

產品規格表 **P270**  
Specification page

## ● RTAS 4 Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材               | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵 FC250 等<br>AiSi 1049, Cast iron<br>炭素鋼, 合金鋼-HRC30       |                               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼 SKD61, NAK 等<br>Prehardened steels, AiSi<br>H13<br>合金鋼、工具鋼、預硬鋼 |                                      | Austenitic stainless steels<br>SUS304, SUS316 等<br>AiSi 304, AiSi 316<br>沃斯田鐵系列不鏽鋼                    |               | Hardened steels<br>SKD61, SKD11, NAK,<br>STAVAX 等<br>AiSi H13<br>熱處理鋼 (HRC45~50) |                               | Hardened steels<br>SKD11, 等 AiSi D2<br>熱處理鋼 HRC55~60 |                                      |                               |               |     |    |  |
|------------------------------------|--|-------------------------------|---|--------------------------------------|---|---------------|--|-------------------------------|--|--------------------------------------|-------------------------------|---------------|-----|----|--|
| Cutting Speed<br>切削速度              | 50~100m/min  |                               | 50~70m/min  |                                      | 30~60m/min  |               | 20~40m/min   |                               | 15~30m/min   |                                      |                               |               |     |    |  |
| Diameter<br>直徑 (mm)                | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |   | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度   |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 |  | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |               |     |    |  |
|                                    |  | Side<br>Milling<br>側面         | Slotting<br>溝   |                                      | Side<br>Milling<br>側面   | Slotting<br>溝 |  | Side<br>Milling<br>側面         | Slotting<br>溝  |                                      | Side<br>Milling<br>側面         | Slotting<br>溝 |     |    |  |
| 8                                  | 4000   | 680                           |   | 2400                                 | 360   |               | 2000   | 330                           |  | 1600                                 | 130                           |               | 800 | 70 |  |
| 10                                 | 3200   | 590                           |   | 1900                                 | 290   |               | 1600   | 290                           |  | 1300                                 | 120                           |               | 650 | 65 |  |
| 12                                 | 2700   | 500                           |   | 1600                                 | 240   |               | 1300   | 230                           |  | 1100                                 | 100                           |               | 530 | 55 |  |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 | 側面 Side Milling<br> |                               |   |                                      | 側面 Side Milling<br> |               |  |                               |  |                                      |                               |               |     |    |  |

產品規格表 **P270**  
Specification page

## ● RTAS 4 Flutes High-Speed Milling Conditions 高速標準切削

| Work material<br>被削材                    | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵 FC250 等<br>AiSi 1049, Cast iron<br>炭素鋼, 合金鋼-HRC30 |                               | Alloy Steel, Tool Steel<br>預硬鋼, SKD61, NAK 等<br>Pre-hardened steel AiSi H13<br>合金鋼, 工具鋼 HRC30~45 |                               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX 等<br>AiSi H13<br>熱處理鋼 HRC45~55 |                               | Hardened steels<br>SKD11 等 AiSi D2<br>熱處理鋼 HRC55~60 |                               |
|---|--|-------------------------------|--|-------------------------------|---|-------------------------------|---|-------------------------------|
| Cutting Speed<br>切削速度                   | 300m/min   |                               | 200m/min   |                               | 150m/min  |                               | 50m/min   |                               |
| Diameter<br>直徑 (mm)                     | Speed (min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數  | Feed Rate<br>(mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed (min <sup>-1</sup> )<br>迴轉數                   | Feed Rate<br>(mm/min)<br>進給速度 |
|   |  |                               |  |                               |   |                               |   |                               |
| 10                                      | 9500   | 2000                          | 6300   | 1290                          | 4700  | 410                           | 1600  | 160                           |
| 12                                      | 7900   | 1800                          | 5300   | 1125                          | 3900  | 360                           | 1300  | 135                           |
| (mm) Ap<br>Milling Amount<br>軸方向<br>切削量 | Ap=0.05D   |                               | Ap=0.03D   |                               | Ap=0.02D  |                               | Ap=0.02D  |                               |

### ▲ Caution

1. Please use Si coating tools for work materials of 50~60HRC.
2. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
3. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
4. When drilling, please set the feed rate at 1/3 or below of the above value.

### ▲ 注意事項

1. 切削50~60HRC以上之材料時，請使用Si鍍膜之刀具。
2. 切削沃斯田鐵系列不鏽鋼時，請使用非水溶性切削油效果較好。
3. 機械設備或工作的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表1/3以下。

產品規格表 **P271**  
Specification page

### • SES 2Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材  | Copper<br>銅                          |                            |               | Carbon Steel, Alloy Steel<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>炭素鋼, 合金鋼-HRC30 |                            |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼、工具鋼、預硬鋼 |                            |               | Austenitic stainless steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                            |               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX<br>等AISI H13<br>熱處理鋼 (HRC45~50) |                            |               |
|-----------------------|--------------------------------------|----------------------------|---------------|--|----------------------------|---------------|--|----------------------------|---------------|---|----------------------------|---------------|--|----------------------------|---------------|
| Cutting Speed<br>切削速度 | 80~150m/min                          |                            |               | 50~100m/min  |                            |               | 50~70m/min   |                            |               | 30~60m/min  |                            |               | 20~40m/min   |                            |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               |
|                       |                                      | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |
| 8                     | 6000                                 | 1000                       | 330           | 4000   | 520                        | 410           | 2800   | 350                        | 280           | 1600  | 260                        | 150           | 1200   | 65                         | 50            |
| 10                    | 4800                                 | 1000                       | 330           | 3200   | 450                        | 360           | 2200   | 300                        | 240           | 1300  | 230                        | 130           | 1000   | 65                         | 50            |
| 12                    | 4000                                 | 1000                       | 330           | 2700   | 410                        | 320           | 1900   | 270                        | 210           | 1100  | 210                        | 120           | 800  | 65                         | 50            |
| 16                    | 3000                                 | 1000                       | 330           | 2000   | 240                        | 190           | 1400   | 210                        | 160           | 840   | 160                        | 100           | 600  | 60                         | 45            |
| 20                    | 2400                                 | 1000                       | 330           | 1600   | 200                        | 160           | 1100   | 170                        | 130           | 680   | 140                        | 80            | 480  | 50                         | 40            |

Depth of cut  
(D:直徑Dia)  
切削量基準

產品規格表 **P271**  
Specification page

### • SES 4Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材  | Carbon Steels, Alloy Steels<br>S50C, SCM, 鑄鐵FC250等<br>AISI 1049, Cast iron<br>炭素鋼, 合金鋼-HRC30 |                            |               | HRC30~45<br>Alloy Steels, Tool Steels<br>調質鋼SKD61, NAK等<br>Prehardened steels, AISI H13<br>合金鋼、工具鋼、預硬鋼 |                            |               | Austenitic stainless steels<br>SUS304, SUS316等<br>AISI 304, AISI 316<br>沃斯田鐵系列不鏽鋼 |                            |               | Hardened steels<br>SKD61, SKD11, NAK, STAVAX等<br>AISI H13<br>熱處理鋼 (HRC45~50) |                            |               |
|-----------------------|--|----------------------------|---------------|--|----------------------------|---------------|---|----------------------------|---------------|--|----------------------------|---------------|
| Cutting Speed<br>切削速度 | 50~100m/min  |                            |               | 50~70m/min   |                            |               | 30~60m/min  |                            |               | 20~40m/min   |                            |               |
| Diameter<br>直徑(mm)    | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數  | Feed Rate (mm/min)<br>進給速度 |               | Speed<br>(min <sup>-1</sup> )<br>迴轉數   | Feed Rate (mm/min)<br>進給速度 |               |
|                       |  | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |   | Side Milling<br>側面         | Slotting<br>溝 |  | Side Milling<br>側面         | Slotting<br>溝 |
| 8                     | 4000   | 780                        | 620           | 2800   | 520                        | 410           | 1600  | 390                        | 230           | 2000   | 160                        | 125           |
| 10                    | 3200   | 680                        | 540           | 2200   | 450                        | 360           | 1300  | 340                        | 200           | 1600   | 140                        | 110           |
| 12                    | 2700   | 620                        | 490           | 1900   | 410                        | 320           | 1100  | 310                        | 180           | 1300   | 120                        | 95            |
| 16                    | 2000   | 360                        | 280           | 1400   | 310                        | 240           | 840   | 240                        | 140           | 1000   | 100                        | 80            |
| 20                    | 1600   | 300                        | 240           | 1100   | 250                        | 200           | 680   | 210                        | 120           | 800  | 90                         | 70            |

Depth of cut  
(D:直徑Dia)  
切削量基準

#### ▲ Caution

- In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
- If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
- When drilling, please set the feed rate at 1/3 or below of the above value.

#### ▲ 注意事項

- 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
- 機械設備或工作的夾持剛性不足、出現震動時，請以相同比例按上表降低迴轉數及進給速度。
- 縱向進給時，進給速度請設定為上表之1/3以下。

產品規格表 **P272**  
Specification page

### ● PES 3Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材               | Carbon Steels S50C<br>炭素鋼            |                            |               |                | Alloy Tool Steels, SCM, SKD<br>合金工具鋼 |                            |               |                | Stainless Steels, Titanium Alloys<br>SUS304, SUS316等<br>不鏽鋼,鈦合金 |                            |               |                | Prehardened Steels, HPM, NAK<br>調質鋼-HRC40 |                            |               |                |
|------------------------------------|--------------------------------------|----------------------------|---------------|----------------|--------------------------------------|----------------------------|---------------|----------------|---|----------------------------|---------------|----------------|---|----------------------------|---------------|----------------|
| Cutting Speed<br>切削速度              | ~100m/min                            |                            |               |                | ~50m/min                             |                            |               |                | ~35m/min  |                            |               |                | ~56m/min                                  |                            |               |                |
| Diameter<br>直徑(mm)                 | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |               |                | Speed<br>(min <sup>-1</sup> )<br>迴轉數 | Feed Rate (mm/min)<br>進給速度 |               |                | Speed<br>(min <sup>-1</sup> )<br>迴轉數                            | Feed Rate (mm/min)<br>進給速度 |               |                | Speed<br>(min <sup>-1</sup> )<br>迴轉數      | Feed Rate (mm/min)<br>進給速度 |               |                |
|                                    |                                      | Side Milling<br>側面         | Slotting<br>溝 | Drilling<br>縱向 |                                      | Side Milling<br>側面         | Slotting<br>溝 | Drilling<br>縱向 |   | Side Milling<br>側面         | Slotting<br>溝 | Drilling<br>縱向 |   | Side Milling<br>側面         | Slotting<br>溝 | Drilling<br>縱向 |
| 8                                  | 3600                                 | 1000                       | 760           | 300            | 1600                                 | 400                        | 300           | 120            | 1400  | 300                        | 120           | -              | 2200                                      | 600                        | 330           | 100            |
| 10                                 | 3000                                 | 900                        | 800           | 300            | 1300                                 | 350                        | 200           | 100            | 1100  | 300                        | 100           | -              | 1700                                      | 400                        | 200           | 80             |
| 12                                 | 2600                                 | 850                        | 740           | 280            | 1100                                 | 340                        | 180           | 80             | 900   | 270                        | 100           | -              | 1500                                      | 340                        | 180           | 70             |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 |                                      |                            |               |                |                                      |                            |               |                |   |                            |               |                |   |                            |               |                |

#### ▲ Caution

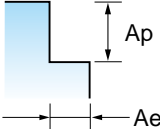
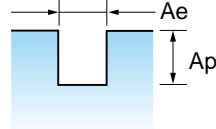
1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Air blow is recommended.
4. Non-water cutting fluid is recommended for cutting stainless steels.

#### ▲ 注意事項

1. 請使用剛性及精準度較佳之機械及夾頭。
2. 當切削量過大或機械剛性不足時，請降低迴轉速及進給速度。
3. 請使用吹氣方式進行切削。
4. 切削不鏽鋼時，請使用非水溶性切削油。

產品規格表 **P273**  
Specification page


## • AES5 2 Flutes Standard Cutting Conditions 標準切削

| Work material<br>被削材               | Aluminum<br>1070<br>鋁   |                               |                                       |                               | Aluminum Alloy<br>2017.5052.7075<br>鋁合金 |                               |                                       |                               | Aluminum Alloy Cast<br>AC8C<br>鍛造鋁    |                               |                                       |                               |
|------------------------------------|---|-------------------------------|---------------------------------------|-------------------------------|---|-------------------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|
|                                    | 300m/min  |                               | 220m/min                              |                               | 330m/min                                |                               | 240m/min                              |                               | 250m/min                              |                               | 160m/min                              |                               |
|                                    | Side Milling<br>側面  |                               | Slotting<br>溝                         |                               | Side Milling<br>側面                      |                               | Slotting<br>溝                         |                               | Side Milling<br>側面                    |                               | Slotting<br>溝                         |                               |
| Diameter<br>直徑(mm)                 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| 8                                  | 12000   | 1650                          | 8800                                  | 1125                          | 13000                                   | 2400                          | 9600                                  | 1200                          | 9900                                  | 1800                          | 6400                                  | 750                           |
| 10                                 | 9600  | 1650                          | 7000                                  | 1200                          | 10500                                   | 2550                          | 7600                                  | 1275                          | 8000                                  | 1950                          | 5100                                  | 825                           |
| 12                                 | 8000  | 1800                          | 5800                                  | 1200                          | 8800                                    | 2550                          | 6400                                  | 1350                          | 6600                                  | 1950                          | 4200                                  | 900                           |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 | <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><math>A_p \leq 0.5D</math><br/><math>A_e \leq 0.2D</math></p> </div> <div style="text-align: center;">  <p><math>A_p \leq 0.5D</math></p> </div> </div> |                               |                                       |                               |   |                               |                                       |                               |                                       |                               |                                       |                               |



產品規格表 **P273**  
Specification page

## • AES5 3 Flutes Standard Cutting Conditions 標準切削

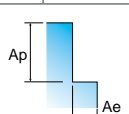
| Work material<br>被削材               | Aluminum<br>1070<br>鋁   |                               |                                       |                               | Aluminum Alloy<br>2017.5052.7075<br>鋁合金 |                               |                                       |                               | Aluminum Alloy Cast<br>AC8C<br>鍛造鋁    |                               |                                       |                               |
|------------------------------------|---|-------------------------------|---------------------------------------|-------------------------------|---|-------------------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|---------------------------------------|-------------------------------|
|                                    | 300m/min  |                               | 220m/min                              |                               | 330m/min                                |                               | 240m/min                              |                               | 250m/min                              |                               | 160m/min                              |                               |
| Cutting Speed<br>切削速度              | Side Milling<br>側面  |                               | Slotting<br>溝                         |                               | Side Milling<br>側面                      |                               | Slotting<br>溝                         |                               | Side Milling<br>側面                    |                               | Slotting<br>溝                         |                               |
|                                    | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數   | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 | Speed<br>( $\text{min}^{-1}$ )<br>迴轉數 | Feed Rate<br>(mm/min)<br>進給速度 |
| 8                                  | 12000   | 1100                          | 8800                                  | 750                           | 13000                                   | 1600                          | 9600                                  | 800                           | 9900                                  | 1200                          | 6400                                  | 500                           |
| 10                                 | 9600  | 1100                          | 7000                                  | 800                           | 10500                                   | 1700                          | 7600                                  | 850                           | 8000                                  | 1300                          | 5100                                  | 550                           |
| 12                                 | 8000  | 1200                          | 5800                                  | 800                           | 8800                                    | 1700                          | 6400                                  | 900                           | 6600                                  | 1300                          | 4200                                  | 600                           |
| Depth of cut<br>(D:直徑Dia)<br>切削量基準 |  <p> <math>Ap \leq 0.5D</math><br/> <math>Ae \leq 0.2D</math> </p> <p> <math>Ap \leq 0.5D</math> </p> |                               |                                       |                               |   |                               |                                       |                               |                                       |                               |                                       |                               |

產品規格表 **P274**  
Specification page

### ● FHPCS 4 Flutes Side Milling 側面切削

| Work material<br>被削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、<br>鑄鐵 |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55,<br>HPM1<br>調質鋼 HRC30~38 |                       | Hardened steels, Stainless<br>steels<br>SUS304, SKD<br>調質鋼 HRC38~45 |                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels,<br>調質鋼 HRC45~55 |                       | Hardened steels,<br>調質鋼 HRC55~60 |                       |
|----------------------|--|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|----------------------------------|-----------------------|
|                      | Cutting Speed<br>切削速度  |                       | 78m/min   |                       | 66m/min   |                       | 62m/min   |                       | 60m/min  |                       | 30m/min                          |                       |
| Mill DIA.(mm)<br>直徑  | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Speed (mm/min)<br>送速度 |
| 3                    | 8480   | 975                   | 6640  | 760                   | 5600  | 560                   | 5280  | 555                   | 4828   | 485                   | 2560                             | 190                   |
| 4                    | 6360   | 1000                  | 4960  | 820                   | 4200  | 565                   | 3960  | 590                   | 3800   | 515                   | 1920                             | 190                   |
| 5                    | 5080   | 1050                  | 3960  | 845                   | 3360  | 590                   | 3160  | 630                   | 3040   | 535                   | 1520                             | 190                   |
| 6                    | 4240   | 1250                  | 3320  | 945                   | 2800  | 700                   | 2640  | 660                   | 2560   | 545                   | 1280                             | 190                   |
| 8                    | 3200   | 1250                  | 2480  | 895                   | 2120  | 660                   | 1960  | 640                   | 1920   | 555                   | 960                              | 175                   |
| 10                   | 2560   | 1100                  | 2000  | 855                   | 1680  | 605                   | 1560  | 590                   | 1520   | 525                   | 764                              | 160                   |
| 12                   | 2120   | 1100                  | 1640  | 850                   | 1400  | 565                   | 1320  | 535                   | 1280   | 475                   | 636                              | 160                   |
| 16                   | 1600   | 955                   | 1240  | 745                   | 1040  | 500                   | 1000  | 445                   | 960  | 400                   | 476                              | 160                   |
| 20                   | 1280   | 765                   | 1000  | 595                   | 840   | 455                   | 788   | 395                   | 764  | 355                   | 380                              | 160                   |


| Depth of cut<br>加工深度  | Ap   |       | Ae   |      |
|---|------|-------|------|------|
|   | Ap   | Ae    | Ap   | Ae   |
|  | 1.5D | 0.2D  | 1.5D | 0.1D |
|   | 1D   | 0.05D |      |      |

產品規格表 **P274**  
Specification page

### ● FHPCS 4 Flutes Slotting 溝切削

| Work material<br>被削材 | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、<br>鑄鐵 |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55,<br>HPM1<br>調質鋼 HRC30~38 |                       | Hardened steels, Stainless<br>steels<br>SUS304, SKD<br>調質鋼 HRC38~45 |                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels,<br>調質鋼 HRC45~55 |                       | Hardened steels,<br>調質鋼 HRC55~60 |                       |
|----------------------|--|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|----------------------------------|-----------------------|
|                      | Cutting Speed<br>切削速度  |                       | 78m/min   |                       | 66m/min   |                       | 62m/min   |                       | 60m/min  |                       | 30m/min                          |                       |
| Mill DIA.(mm)<br>直徑  | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Speed (mm/min)<br>送速度 |
| 3                    | 6800   | 705                   | 5080  | 959                   | 4680  | 455                   | 4400  | 400                   | 3560   | 320                   | 1680                             | 110                   |
| 4                    | 5080   | 705                   | 3800  | 675                   | 3520  | 455                   | 3320  | 450                   | 2680   | 360                   | 1280                             | 120                   |
| 5                    | 4080   | 715                   | 3040  | 660                   | 2800  | 475                   | 2640  | 475                   | 2120   | 385                   | 1000                             | 125                   |
| 6                    | 3400   | 715                   | 2560  | 560                   | 2320  | 500                   | 2200  | 495                   | 1800   | 400                   | 840                              | 125                   |
| 8                    | 2560   | 660                   | 1920  | 550                   | 1760  | 545                   | 1640  | 515                   | 1320   | 415                   | 636                              | 125                   |
| 10                   | 2040   | 610                   | 1520  | 535                   | 1400  | 475                   | 1320  | 470                   | 1080   | 380                   | 508                              | 115                   |
| 12                   | 1680   | 610                   | 1280  | 475                   | 1160  | 450                   | 1120  | 440                   | 880  | 355                   | 424                              | 115                   |
| 16                   | 1280   | 610                   | 960   | 430                   | 880   | 370                   | 840   | 370                   | 668  | 300                   | 320                              | 88                    |
| 20                   | 1000   | 510                   | 764   | 380                   | 700   | 350                   | 664   | 330                   | 536  | 265                   | 256                              | 89                    |

| Depth of cut<br>加工深度  | Ap      |          |
|---|---------|----------|
|   | Ap      | Ae       |
|  | Ap=0.5D |          |
|   |         | Ap=0.05D |

#### ▲ Caution

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During Dry (no fluid) Milling, please use air blow to remove disposable chips from the Milling area and the eliminate chip packing.

#### ▲ 注意事項

1. 請使用準確性和高剛性之機器及刀把
2. 當切削深度過大或機器剛性不足請調整轉速
3. 請使用有效抑止煙霧之流體
4. 在乾式切削時請使用吹氣去除切削範圍之廢屑

產品規格表 **P274**  
Specification page

## ● FHPCS 4 Flutes High Speed Side Milling 高速側面切削

The conditions below are for high speed / high precision machining centers.

| Work material<br>被削材  | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm2)<br>一般構造用鋼、碳素鋼、鑄鐵 |                       | 合金鋼、工具鋼<br>Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30 |                       | 調質鋼 HRC30~38<br>Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55,<br>HPM1 |                       | 調質鋼 HRC38~45<br>Hardened steels, Stainless<br>steels<br>SUS304, SKD |                       | 調質鋼 HRC45~55<br>Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels, |                       | 調質鋼 HRC55~60<br>Hardened steels, |                       |
|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|----------------------------------|-----------------------|
| Cutting Speed<br>切削速度 | 100m/min  |                       | 78m/min   |                       | 66m/min   |                       | 62m/min   |                       | 60m/min  |                       | 30m/min                          |                       |
| Mill DIA.(mm)<br>直徑   | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度 | Speed (mm/min)<br>送速度 |
| 3                     | 16960   | 2150                  | 16960   | 2400                  | 16960   | 1300                  | 12720   | 1150                  | 8480   | 680                   | 6800                             | 440                   |
| 4                     | 12720   | 2050                  | 12720   | 2300                  | 12720   | 1300                  | 9520  | 1250                  | 6360   | 795                   | 5080                             | 460                   |
| 5                     | 10160   | 1900                  | 10160   | 2150                  | 10160   | 1250                  | 7640  | 1350                  | 5080   | 840                   | 4080                             | 510                   |
| 6                     | 8480  | 3050                  | 8480  | 2650                  | 8480  | 2000                  | 6360  | 1450                  | 4240   | 910                   | 3400                             | 610                   |
| 8                     | 6360  | 2800                  | 6360  | 2400                  | 6360  | 1900                  | 4760  | 1400                  | 3200   | 860                   | 2560                             | 575                   |
| 10                    | 5080  | 2550                  | 5080  | 2200                  | 5080  | 1850                  | 3800  | 1350                  | 2560   | 830                   | 2040                             | 510                   |
| 12                    | 4240  | 2550                  | 4240  | 2200                  | 4240  | 1800                  | 3200  | 1350                  | 2120   | 830                   | 1680                             | 510                   |
| 16                    | 3200  | 1900                  | 3200  | 1900                  | 3200  | 1700                  | 2400  | 1350                  | 1600   | 830                   | 1280                             | 510                   |
| 20                    | 2560  | 1550                  | 2560  | 1550                  | 2560  | 1550                  | 1920  | 1150                  | 1280   | 730                   | 1000                             | 510                   |

| Depth of cut<br>加工深度 | Ap Ae       |       | Ap Ae       |       | Ap Ae       |       |
|----------------------|-------------|-------|-------------|-------|-------------|-------|
|                      | D<Ø6        | Ø6≦D  | D<Ø6        | Ø6≦D  | D<Ø6        | Ø6≦D  |
|                      | 1.5D        | 0.02D | 1.5D        | 0.01D | 1D          | 0.01D |
|                      | 1.5D        | 0.05D | 1.5D        | 0.02D | 1D          | 0.02D |
|                      | AeMax=0.5mm |       | AeMax=0.5mm |       | AeMax=0.5mm |       |

### ▲ Caution

Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures.

### ▲ 注意事項

當刀具斷裂而持續使用即會產生火花及發熱，請確實遵守預防火災之措施。

產品規格表 **P274**  
Specification page

## ● FHPCS 4 Flutes High Speed Slotting 高速溝切削

The conditions below are for high speed / high precision machining centers.

| Work material<br>被削材  | Mild steels Carbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm2)<br>一般構造用鋼、碳素鋼、鑄鐵 |                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼 HRC30~38 |                       | Hardened steels, Stainless<br>steels<br>SUS304, SKD<br>調質鋼 HRC38~45 |                       |
|-----------------------|---|-----------------------|---|-----------------------|--|-----------------------|---|-----------------------|
| Cutting Speed<br>切削速度 | 100m/min  |                       | 78m/min   |                       | 66m/min  |                       | 62m/min   |                       |
| Mill DIA.(mm)<br>直徑   | Speed(mm <sup>-1</sup> )<br>迴轉速度  | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                      | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度   | Speed (mm/min)<br>送速度 | Speed(mm <sup>-1</sup> )<br>迴轉速度                                    | Speed (mm/min)<br>送速度 |
| 3                     | 10160   | 1050                  | 8480  | 935                   | 7640   | 745                   | 5080  | 460                   |
| 4                     | 7640  | 1150                  | 6360  | 1000                  | 5720   | 745                   | 4120  | 560                   |
| 5                     | 6120  | 1200                  | 5600  | 1100                  | 5080   | 865                   | 3320  | 595                   |
| 6                     | 2920  | 1550                  | 4680  | 1150                  | 4240   | 910                   | 2960  | 670                   |
| 8                     | 3800  | 1450                  | 3520  | 1300                  | 3200   | 985                   | 2240  | 690                   |
| 10                    | 3040  | 1400                  | 2800  | 1200                  | 2560   | 865                   | 1800  | 635                   |
| 12                    | 2560  | 1250                  | 2320  | 1150                  | 2120   | 815                   | 1480  | 595                   |
| 16                    | 1920  | 1050                  | 1760  | 965                   | 1600   | 675                   | 1120  | 500                   |
| 20                    | 1520  | 840                   | 1400  | 770                   | 1280   | 635                   | 880   | 445                   |

| Depth of cut<br>加工深度 | Ap        |      |
|----------------------|-----------|------|
|                      | D<Ø6      | Ø6≦D |
|                      | 0.2D      | 3mm  |
|                      | ApMax=3mm |      |

### ▲ Caution

1. Use a rigid and precise machine and holder.
2. Please adjust the speed and feed when the cutting depth is large or when machines with low rigidity are used.
3. Please use a suitable fluid with high smoke retardant properties.
4. During Dry (no fluid) Milling, please use air blow to remove disposable chips from the Milling area and the eliminate chip packing.

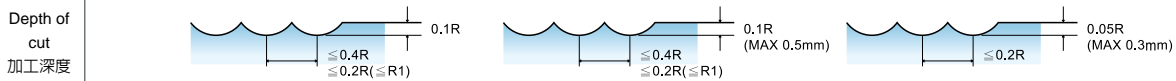
### ▲ 注意事項

1. 請使用準確性和高剛性之機器及刀把
2. 當切削深度過大或機器剛性不足請調整轉速
3. 請使用有效抑制煙霧之液體
4. 在乾式切削時請使用吹氣去除切削範圍之廢屑

產品規格表 **P275**  
Specification page

### ● KTGS 2 Flutes Standard Cutting Conditions 標準標準切削

| Work material<br>被削材 | Alloy steels, Tool steels, Prehardened steels,<br>SCM, SKD61, SKD11, NAK, AISI H3, AISI D2 ect.<br>合金鋼、工具鋼、預硬鋼 ~HRC45 |  |                                       |                          |             | Hardened steels,<br>SKD61, SKD11, STAVAX, AISI H13 ect.<br>調質鋼 HRC45-55 |                                       |                          |             |                | Hardened steels,<br>SKD11, SKH, SKS, ASP23, AISI H13 ect.<br>調質鋼 HRC55-62 |                          |              |                |  |
|----------------------|---|--|---------------------------------------|--------------------------|-------------|---|---------------------------------------|--------------------------|-------------|----------------|---|--------------------------|--------------|----------------|--|
|                      | R<br>(mm)<br>球頭半徑   | Inclination of Machining Surface<br>加工面傾斜角 | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)    |   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)    |                | Speed<br>(min <sup>-1</sup> )<br>迴轉速度                                     | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)     |                |  |
|                      |   |  |                                       |                          | Pf          | Ad  |                                       |                          | Pf          | Ad             |   |                          | Pf           | Ad             |  |
|                      |   |  |                                       |                          | Pick feed   | Milling Amount  |                                       |                          | Pick feed   | Milling Amount |   |                          | Pick feed    | Milling Amount |  |
| D0.5R                | $\alpha \leq 15^\circ$  | 40000                                      | 3120                                  | $\leq 0.2R$              | $\leq 0.1R$ | 35000   | 2340                                  | $\leq 0.2R$              | $\leq 0.1R$ | 21000          | 1300  | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 35000                                      | 2080                                  | $\leq 0.2R$              | $\leq 0.1R$ | 30000   | 1430                                  | $\leq 0.2R$              | $\leq 0.1R$ | 15000          | 740   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D0.75R               | $\alpha \leq 15^\circ$  | 40000                                      | 3900                                  | $\leq 0.2R$              | $\leq 0.1R$ | 30000   | 2470                                  | $\leq 0.2R$              | $\leq 0.1R$ | 14000          | 1160  | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 30000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 25000   | 1560                                  | $\leq 0.4R$              | $\leq 0.1R$ | 10000          | 610   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D1R                  | $\alpha \leq 15^\circ$  | 35000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 25000   | 2340                                  | $\leq 0.4R$              | $\leq 0.1R$ | 11000          | 1040  | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 25000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 20000   | 1430                                  | $\leq 0.4R$              | $\leq 0.1R$ | 8000           | 560   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D1.25R               | $\alpha \leq 15^\circ$  | 33000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 22000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 9300           | 920   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 24000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 17000   | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 6500           | 480   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D1.5R                | $\alpha \leq 15^\circ$  | 30000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 20000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 8000           | 870   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 23000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 15000   | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 5600           | 450   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D2R                  | $\alpha \leq 15^\circ$  | 25000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 17000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 6400           | 830   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 20000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 13000   | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 4500           | 440   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D2.5R                | $\alpha \leq 15^\circ$  | 23000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 15000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 5000           | 710   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 17000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 11000   | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 3500           | 380   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D3R                  | $\alpha \leq 15^\circ$  | 20000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 13000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 4200           | 690   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 15000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 10000   | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 2900           | 350   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D4R                  | $\alpha \leq 15^\circ$  | 15000                                      | 3900                                  | $\leq 0.4R$              | $\leq 0.1R$ | 10000   | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 3200           | 700   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 11000                                      | 2210                                  | $\leq 0.4R$              | $\leq 0.1R$ | 7500  | 1300                                  | $\leq 0.4R$              | $\leq 0.1R$ | 2200           | 360   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D5R                  | $\alpha \leq 15^\circ$  | 12000                                      | 3770                                  | $\leq 0.4R$              | $\leq 0.1R$ | 8000  | 2080                                  | $\leq 0.4R$              | $\leq 0.1R$ | 2500           | 660   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 9000                                       | 2080                                  | $\leq 0.4R$              | $\leq 0.1R$ | 6000  | 1170                                  | $\leq 0.4R$              | $\leq 0.1R$ | 1800           | 350   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
| D6R                  | $\alpha \leq 15^\circ$  | 10000                                      | 3250                                  | $\leq 0.4R$              | $\leq 0.1R$ | 6600  | 1820                                  | $\leq 0.4R$              | $\leq 0.1R$ | 2100           | 570   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |
|                      | $\alpha > 15^\circ$   | 7500                                       | 1820                                  | $\leq 0.4R$              | $\leq 0.1R$ | 5000  | 1040                                  | $\leq 0.4R$              | $\leq 0.1R$ | 1500           | 300   | $\leq 0.2R$              | $\leq 0.05R$ |                |  |



#### ▲ Caution

1.  $\alpha$  is the inclination of machining surface.
2. If the rigidity of the machine or the work material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.
3. Cutting condition may be considerably different due to the overhang(milling depth and neck length),depth of cut, and machine tools.
4. If the depth of cut is shallow, the revolution and feed rate can be increased.

#### ▲ 注意事項

1.  $\alpha$  為加工面的傾斜角。
2. 機械設備或工件的夾持剛性不足、出現震動或異常聲音時，請以相同比例按上表降低迴轉數及進給速度。此外，重視加工精度時，建議降低進給速度。
3. 有時候切削條件會因為刀具伸出長度、材料、機械設備的差異性而需要做調整，上表僅供一般情況參考用。
4. 切削深度較小時，可以提高迴轉數及進給速度。

產品規格表 **P275**  
Specification page

### ● KTGS 2 Flutes High Speed Milling Conditions 高速標準切削

| Work material<br>被削材 | Alloy steels, Tool steels, Prehardened steels,<br>SCM, SKD61, SKD11, NAK, AISI H3 ,AISI D2 ect.<br>合金鋼、工具鋼、預硬鋼 ~HRC45 |                     |                                       |                          |           | Hardened steels,<br>SKD61, SKD11, STAVAX, AISI H13 ect.<br>調質鋼 HRC45~55 |                                       |                          |           | Hardened steels,<br>SKD11, SKH, SKS, ASP23, AISI H13 ect.<br>調質鋼 HRC55~62 |                                       |                          |           |                |
|----------------------|---|---------------------|---------------------------------------|--------------------------|-----------|---|---------------------------------------|--------------------------|-----------|---|---------------------------------------|--------------------------|-----------|----------------|
|                      | R<br>(mm)<br>球頭半徑   | Cutting Way<br>加工方式 | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)  |   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)  |   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 | 切削量 (mm)  |                |
|                      |   |                     |                                       |                          | Pf        | Ad  |                                       |                          | Pf        | Ad  |                                       |                          | Pf        | Ad             |
|                      |   |                     |                                       |                          | Pick feed | Milling Amount  |                                       |                          | Pick feed | Milling Amount  |                                       |                          | Pick feed | Milling Amount |
| D0.5R                | 粗 (R)   | 40000               | 3120                                  | 0.2                      | 0.05      | 40000   | 2470                                  | 0.15                     | 0.04      | 30000   | 1560                                  | 0.1                      | 0.03      |                |
|                      | 精 (F)   | 40000               | 3900                                  | 0.1                      | 0.05      | 40000   | 3120                                  | 0.8                      | 0.04      | 30000   | 1950                                  | 0.6                      | 0.03      |                |
| D1R                  | 粗 (R)   | 40000               | 6240                                  | 0.2                      | 0.2       | 40000   | 4940                                  | 0.2                      | 0.15      | 20000   | 2080                                  | 0.15                     | 0.12      |                |
|                      | 精 (F)   | 40000               | 7800                                  | 0.2                      | 0.1       | 40000   | 6240                                  | 0.1                      | 0.1       | 20000   | 2600                                  | 0.1                      | 0.06      |                |
| D2R                  | 粗 (R)   | 30000               | 6240                                  | 0.4                      | 0.3       | 30000   | 4940                                  | 0.3                      | 0.2       | 20000   | 2470                                  | 0.25                     | 0.15      |                |
|                      | 精 (F)   | 30000               | 7800                                  | 0.2                      | 0.15      | 30000   | 6240                                  | 0.2                      | 0.1       | 20000   | 3120                                  | 0.2                      | 0.1       |                |
| D3R                  | 粗 (R)   | 20000               | 5200                                  | 0.6                      | 0.4       | 20000   | 4160                                  | 0.5                      | 0.3       | 16000   | 2470                                  | 0.3                      | 0.2       |                |
|                      | 精 (F)   | 20000               | 6500                                  | 0.2                      | 0.2       | 20000   | 5200                                  | 0.2                      | 0.2       | 16000   | 3120                                  | 0.2                      | 0.2       |                |
| D4R                  | 粗 (R)   | 16000               | 4940                                  | 1                        | 0.8       | 16000   | 3900                                  | 0.8                      | 0.6       | 10000   | 1820                                  | 0.7                      | 0.5       |                |
|                      | 精 (F)   | 16000               | 6240                                  | 0.2                      | 0.2       | 16000   | 4940                                  | 0.2                      | 0.2       | 10000   | 2340                                  | 0.2                      | 0.2       |                |
| D5R                  | 粗 (R)   | 12000               | 4680                                  | 2                        | 1         | 12000   | 3640                                  | 1                        | 0.8       | 8000  | 1560                                  | 1                        | 0.7       |                |
|                      | 精 (F)   | 12000               | 5850                                  | 0.3                      | 0.3       | 12000   | 4680                                  | 0.2                      | 0.2       | 8000  | 2080                                  | 0.2                      | 0.2       |                |
| D6R                  | 粗 (R)   | 10000               | 3900                                  | 3                        | 1.2       | 10000   | 3120                                  | 1.5                      | 1.2       | 6400  | 1248                                  | 1.5                      | 1         |                |
|                      | 精 (F)   | 10000               | 4870                                  | 0.3                      | 0.3       | 10000   | 3900                                  | 0.2                      | 0.2       | 6400  | 1560                                  | 0.2                      | 0.2       |                |
| Depth of cut<br>加工深度 |   |                     |                                       |                          |           |   |                                       |                          |           |   |                                       |                          |           |                |

#### ▲ Caution

1.  $\alpha$  is the inclination of machining surface.
2. If the rigidity of the machine or the work material installation is very low, or chattering and noise are generated, please reduce the revolution and the feed rate proportionately.
3. Cutting condition may be considerably different due to the overhang(milling depth and neck length),depth of cut, and machine tools.
4. If the depth of cut is shallow, the revolution and feed rate can be increased.

#### ▲ 注意事項

1.  $\alpha$  為加工面的傾斜角。
2. 機械設備或工件的夾持剛性不足、出現震動或異常聲音時，請以相同比例按上表降低迴轉數及進給速度。此外，重視加工精度時，建議降低進給速度。
3. 有時候切削條件會因為刀具伸出長度、材料、機械設備的差異性而需要做調整，上表僅供一般情況參考用。
4. 切削深度較小時，可以提高迴轉數及進給速度。

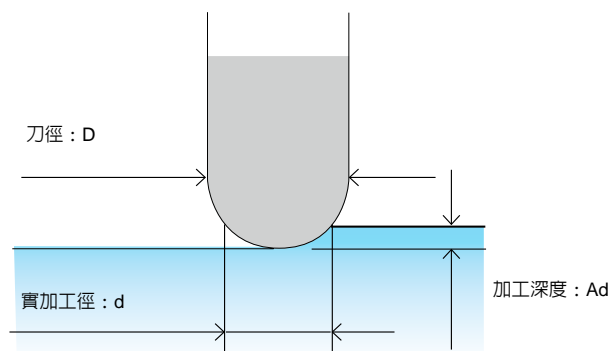
產品規格表 **P275**  
Specification page

## ● KTGS 2 Flutes Ball End Milling Actual Diameter 球型銑刀實際加工直徑速查表

| R      | D   | Depth of cut (mm) 加工深度 |       |       |       |       |       |      |      |      |      |      |      |      |       |       |
|--------|-----|------------------------|-------|-------|-------|-------|-------|------|------|------|------|------|------|------|-------|-------|
| R半徑    | 刀徑  |                        |       |       |       |       |       |      |      |      |      |      |      |      |       |       |
| Radius | Dia | 0.01                   | 0.02  | 0.03  | 0.04  | 0.05  | 0.08  | 0.1  | 0.15 | 0.2  | 0.3  | 0.5  | 0.8  | 1    | 2     | 3     |
| 0.1    | 0.2 | 0.087                  | 0.12  | 0.143 | 0.16  | 0.173 | 0.196 | 0.2  |      |      |      |      |      |      |       |       |
| 0.2    | 0.4 | 0.125                  | 0.174 | 0.211 | 0.24  | 0.265 | 0.32  | 0.35 | 0.39 | 0.4  |      |      |      |      |       |       |
| 0.3    | 0.6 | 0.154                  | 0.215 | 0.262 | 0.299 | 0.332 | 0.41  | 0.45 | 0.52 | 0.57 | 0.6  |      |      |      |       |       |
| 0.4    | 0.8 | 0.178                  | 0.25  | 0.304 | 0.349 | 0.387 | 0.48  | 0.53 | 0.62 | 0.69 | 0.77 |      |      |      |       |       |
| 0.5    | 1   | 0.199                  | 0.28  | 0.341 | 0.392 | 0.436 | 0.54  | 0.6  | 0.71 | 0.8  | 0.92 | 1    |      |      |       |       |
| 1      | 2   | 0.282                  | 0.398 | 0.486 | 0.56  | 0.624 | 0.78  | 0.87 | 1.05 | 1.2  | 1.43 | 1.73 | 1.96 | 2    |       |       |
| 1.5    | 3   | 0.346                  | 0.488 | 0.597 | 0.688 | 0.768 | 0.97  | 1.08 | 1.31 | 1.5  | 1.8  | 2.24 | 2.65 | 2.83 |       |       |
| 2      | 4   | 0.399                  | 0.564 | 0.69  | 0.796 | 0.889 | 1.12  | 1.25 | 1.52 | 1.74 | 2.11 | 2.65 | 3.2  | 3.46 | 4     |       |
| 2.5    | 5   | 0.447                  | 0.631 | 0.722 | 0.891 | 0.995 | 1.25  | 1.4  | 1.71 | 1.96 | 2.37 | 3    | 3.67 | 4    | 4.9   |       |
| 3      | 6   | 0.489                  | 0.692 | 0.846 | 0.977 | 1.091 | 1.38  | 1.54 | 1.87 | 2.15 | 2.62 | 3.32 | 4.08 | 4.47 | 5.66  | 6     |
| 4      | 8   | 0.565                  | 0.799 | 0.978 | 1.129 | 1.261 | 1.59  | 1.78 | 2.17 | 2.5  | 3.04 | 3.87 | 4.8  | 5.29 | 6.93  | 7.75  |
| 5      | 10  | 0.632                  | 0.894 | 1.094 | 1.262 | 1.411 | 1.78  | 1.99 | 2.43 | 2.8  | 3.41 | 4.36 | 5.43 | 6    | 8     | 9.17  |
| 6      | 12  | 0.693                  | 0.979 | 1.198 | 1.383 | 1.546 | 1.95  | 2.18 | 2.67 | 3.07 | 3.75 | 4.8  | 5.99 | 6.63 | 8.94  | 10.39 |
| 7      | 14  | 0.748                  | 1.058 | 1.295 | 1.495 | 1.67  | 2.11  | 2.36 | 2.88 | 3.32 | 4.05 | 5.2  | 6.5  | 7.21 | 9.8   | 11.49 |
| 8      | 16  | 0.8                    | 1.131 | 1.384 | 1.598 | 1.786 | 2.26  | 2.52 | 3.08 | 3.56 | 4.34 | 5.57 | 6.97 | 7.75 | 10.58 | 12.49 |
| 9      | 18  | 0.848                  | 1.199 | 1.468 | 1.695 | 1.895 | 2.39  | 2.68 | 3.27 | 3.77 | 4.61 | 5.92 | 7.42 | 8.25 | 11.31 | 13.42 |
| 10     | 20  | 0.894                  | 1.264 | 1.548 | 1.787 | 1.997 | 2.52  | 2.82 | 3.45 | 3.98 | 4.86 | 6.24 | 7.84 | 8.72 | 12    | 14.28 |

### Calculation of Actual Dia

$$d = 2\sqrt{Ad(D - Ad)}$$



產品規格表 **P276**  
Specification page

### ● KCRS 4 Flutes High Speed Milling Conditions 高速標準切削

| Work material<br>被削材 | Mild steels arbon steels,<br>Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                       | Alloy steels, Tool steels,<br>SCM, KT,SKS,SKD<br>~HRC30<br>合金鋼、工具鋼 |                                       | Hardened steels,<br>Prehardened steels,<br>(Free-cutting)<br>SKT, SKD, NAK55, HPM1<br>調質鋼HRC30~38 |                                       | Hardened steels,<br>Stainless steels<br>US304, SKD<br>調質鋼HRC38~45  |                                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels,<br>調質鋼HRC45~55 |                                       | Hardened steels,<br>調質鋼HRC55~60 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
|----------------------|---|---------------------------------------|--|---------------------------------------|---|---------------------------------------|--|---------------------------------------|---|---------------------------------------|---------------------------------|---------------------------------------|---|--|--|----|----|-------|---------|------|-------|-------|------|--|--|--|----|----|-------|----------|------|-------|-------|------|
|                      | Mill DIA.<br>(mm)<br>直徑   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度        | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| D10xR2               | 6030  | 13300                                 | 6030   | 12060                                 | 6030  | 12060                                 | 4510   | 9070                                  | 4510  | 8170                                  | 3040                            | 3610                                  |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| D11xR2               | 5510  | 12060                                 | 5510   | 11020                                 | 5510  | 11020                                 | 4130   | 8260                                  | 4130  | 7410                                  | 2750                            | 3320                                  |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| D12xR3               | 5030  | 13300                                 | 5030   | 12060                                 | 5030  | 12060                                 | 3800   | 9070                                  | 3800  | 8170                                  | 2520                            | 3610                                  |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| D13xR3               | 4650  | 12250                                 | 4650   | 11210                                 | 4650  | 11210                                 | 3460   | 8360                                  | 3460  | 7550                                  | 2330                            | 3370                                  |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| 加工深度<br>Depth of cut |   |                                       |  |                                       |   |                                       | <table border="1"> <tr> <th>aa</th> <th>ar</th> </tr> <tr> <td>0.1 x R</td> <td>0.3D</td> </tr> </table> |                                       | aa  | ar                                    | 0.1 x R                         | 0.3D                                  | <table border="1"> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> <tr> <td>R ≤ 2</td> <td>0.1 x R</td> <td>0.3D</td> </tr> <tr> <td>2 &lt; R</td> <td>0.2mm</td> <td>0.3D</td> </tr> </table> |  |  | aa | ar | R ≤ 2 | 0.1 x R | 0.3D | 2 < R | 0.2mm | 0.3D | <table border="1"> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> <tr> <td>R ≤ 2</td> <td>0.05 x R</td> <td>0.3D</td> </tr> <tr> <td>2 &lt; R</td> <td>0.1mm</td> <td>0.3D</td> </tr> </table> |  |  | aa | ar | R ≤ 2 | 0.05 x R | 0.3D | 2 < R | 0.1mm | 0.3D |
|                      | aa  | ar                                    |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| 0.1 x R              | 0.3D  |                                       |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
|                      | aa  | ar                                    |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| R ≤ 2                | 0.1 x R   | 0.3D                                  |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| 2 < R                | 0.2mm   | 0.3D                                  |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
|                      | aa  | ar                                    |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| R ≤ 2                | 0.05 x R  | 0.3D                                  |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |
| 2 < R                | 0.1mm   | 0.3D                                  |  |                                       |   |                                       |  |                                       |   |                                       |                                 |                                       |   |  |  |    |    |       |         |      |       |       |      |  |  |  |    |    |       |          |      |       |       |      |

#### ▲ Caution

Sparks generated during operation or caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures. The conditions below are for high speed/high precision machining centers.

1. Use a rigid and precise machine and holder.
2. These Milling conditions based on Milling with circular interpolation at corners. For Milling without circular interpolation (such as right angle corners), reduce the speed to 50~70% and the cutting depth to 50~80% of the above conditions.
3. We recommend using an air blow or MQL(mist) .
4. Please adjust the speed, feed and cutting depth according to actual Cutting Conditions.
5. When KCRS enter in Z axis, reduce the feed speed to 30~60% of the above conditions with machining incline angle ( $\beta$ )  $\leq 2^\circ$ .
6. These Milling conditions are for a tool extension length : less than 4xD. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

#### ▲ 注意事項

在操作或由於工具發熱而損壞所引起的火花易起火災。請務必使用適當的防火措施。以上條件適用於高速精密加工機器。

1. 使用一台堅固且準確的機器和刀把。
2. 這些研磨條件須以有R角的研磨為基礎，研磨無R角的角度（如90度垂直研磨），將使速度降低到50~70%及減低切割深度50~80%。
3. 我們建議使用一種吹風或者油霧。
4. 請根據實際切削條件調整速度，進給率及切削深度。
5. 在上述條件下操作傾斜角度 ( $\beta$ )  $\leq 2^\circ$  時，當KCRS進入Z軸裡，請降低進給速度30~60%。
6. 這些研磨條件適用於工具延展長度：少於4xD。對於一個延展性長的工具來說，協調個別係數，降低速度、進給率和切削深度以防止砂雜聲。

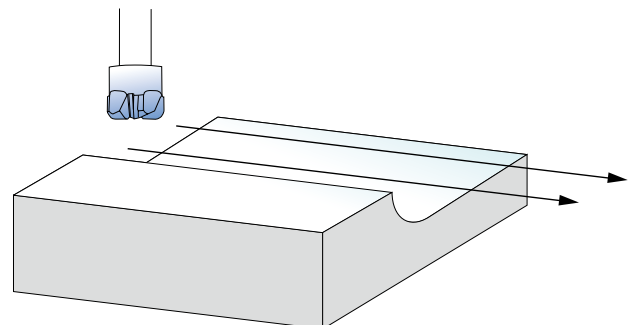
### Tool extension coefficients 工具突出量係數

| Overshank Length<br>工具突出量 | Milling Speed<br>切削速度 | aa<br>軸方向切削 | Feed Speed<br>進給速度 |
|---------------------------|-----------------------|-------------|--------------------|
| L/D ≤ 4                   | 100                   | 100         | 100                |
| L/D ≤ 5                   | 60~80                 | 60~80       | 70~90              |
| L/D ≤ 6                   | 40~60                 | 40~60       | 60~80              |

### Ultra-high speed conditions 超高速條件用


When milling flat areas with a stable load, the speed and the feed rate of the high-speed conditions can be further increased to 150~200%. The ultra-high speed conditions are for a tool extension length: less than 4xD. If the tool extension length is over 4 D, do not refer to it.

在高速及穩定負荷下研磨平坦區域，速度和進給率能更進一步增加150~200%。在高速條件適用於一個工具擴展長度：少於4xD。如果工具擴展長度是在4D上方，請勿參照該條件。



產品規格表 **P276**  
Specification page

### ● KCRS 4 Flutes Low Speed, High Feed Milling 低轉速，高進給切削

| Work material<br>被削材 | Mild steels Carbon steels, Cast iron<br>SS400, S55c, FC250<br>(~750N/mm <sup>2</sup> )<br>一般構造用鋼、碳素鋼、鑄鐵 |                                       | Alloy steels, Tool steels,<br>SCM, SKT, SKS, SKD<br>~HRC30<br>合金鋼、工具鋼 |                                       | Hardened steels,<br>Prehardened steels<br>(Free-cutting)<br>SKT, SKD, NAK55,<br>HPM1<br>調質鋼HRC30~38 |                                       | Hardened steels,<br>Stainless steels<br>SUS304, SKD<br>調質鋼HRC38~45  |                                       | Hardened steels,<br>Titanium alloys,<br>Heat resistant alloys<br>steels,<br>調質鋼HRC45~55 |                                       | Hardened steels,<br>調質鋼HRC55~60 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
|----------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---|---------------------------------------|---------------------------------|---------------------------------------|--------------------------|------|-------|-------|------|---|--|--|----|----|-------|---------|------|-------|-------|------|---|--|--|----|----|-------|---------|------|-------|-------|------|
|                      | Mill DIA.<br>(mm)<br>直徑   | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度  | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度        | Speed<br>(min <sup>-1</sup> )<br>迴轉速度 | Feed<br>(mm/min)<br>進給速度 |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D8xR2                | 3800  | 6650                                  | 3800  | 6030                                  | 3040  | 4840                                  | 2660  | 4230                                  | 1900  | 2710                                  | 1140                            | 1090                                  |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D9xR2                | 3370  | 5890                                  | 3370  | 5370                                  | 2710  | 4320                                  | 2370  | 3750                                  | 1660  | 2420                                  | 1000                            | 950                                   |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D10xR2               | 3040  | 6650                                  | 3040  | 6030                                  | 2420  | 4840                                  | 2140  | 4230                                  | 1520  | 2710                                  | 910                             | 1090                                  |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D11xR2               | 2750  | 6030                                  | 2750  | 5510                                  | 2180  | 4420                                  | 1950  | 3840                                  | 1380  | 2470                                  | 830                             | 1000                                  |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D12xR3               | 2520  | 6650                                  | 2520  | 6030                                  | 2000  | 4840                                  | 1760  | 4230                                  | 1280  | 2710                                  | 750                             | 1090                                  |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| D13xR3               | 2330  | 6130                                  | 2330  | 5600                                  | 1850  | 4460                                  | 1610  | 3900                                  | 1140  | 2520                                  | 700                             | 1000                                  |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| 加工深度<br>Depth of cut |                        |                                       |   |                                       |   |                                       | <table border="1"> <thead> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>R ≧ 2</td> <td>0.2 x R</td> <td>0.5D</td> </tr> <tr> <td>2 &lt; R</td> <td>0.5mm</td> <td>0.5D</td> </tr> </tbody> </table> |                                       |   | aa                                    | ar                              | R ≧ 2                                 | 0.2 x R                  | 0.5D | 2 < R | 0.5mm | 0.5D | <table border="1"> <thead> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>R ≧ 2</td> <td>0.2 x R</td> <td>0.5D</td> </tr> <tr> <td>2 &lt; R</td> <td>0.4mm</td> <td>0.5D</td> </tr> </tbody> </table> |  |  | aa | ar | R ≧ 2 | 0.2 x R | 0.5D | 2 < R | 0.4mm | 0.5D | <table border="1"> <thead> <tr> <th></th> <th>aa</th> <th>ar</th> </tr> </thead> <tbody> <tr> <td>R ≧ 2</td> <td>0.1 x R</td> <td>0.5D</td> </tr> <tr> <td>2 &lt; R</td> <td>0.2mm</td> <td>0.5D</td> </tr> </tbody> </table> |  |  | aa | ar | R ≧ 2 | 0.1 x R | 0.5D | 2 < R | 0.2mm | 0.5D |
|                      | aa  | ar                                    |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| R ≧ 2                | 0.2 x R   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| 2 < R                | 0.5mm   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
|                      | aa  | ar                                    |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| R ≧ 2                | 0.2 x R   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| 2 < R                | 0.4mm   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
|                      | aa  | ar                                    |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| R ≧ 2                | 0.1 x R   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |
| 2 < R                | 0.2mm   | 0.5D                                  |   |                                       |   |                                       |   |                                       |   |                                       |                                 |                                       |                          |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |   |  |  |    |    |       |         |      |       |       |      |

#### ▲ Caution

Sparks generated during operation or heat caused by tool breakage can cause fire.  
Be sure to use all proper fire-prevention measures.  
The conditions below are for high speed/high precision machining centers.

#### ▲ 注意事項

在操作或由於工具發熱而損壞所起的火花易起火災。  
請務必使用適當的防火措施。  
以下條件適用於高速精密加工機器。

1. Use a rigid and precise machine and holder.
2. These Milling conditions based on Milling with circular interpolation at corners. For Milling without circular interpolation (such as right angle corners), reduce the speed to 50~70% and the cutting depth to 50~80% of the above conditions.
3. We recommend using an air blow or MQL(mist).
4. Please adjust the speed, feed and cutting depth according to actual Cutting Conditions.
5. When KCRS enters in Z axis, reduce the feed speed to 30~60% of the above conditions with machining incline angle ( $\beta$ )  $\leq 2^\circ$ .
6. These Milling conditions are for a tool extension length: less than  $4 \times D$ . For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with the respective coefficients, to prevent chattering.

1. 使用一台堅固且準確的機器和刀把。
2. 這些研磨條件須以有R角的研磨為基礎，研磨無R角的角度（如90度垂直研磨），將使速度降低到50~70%及減低切割深度50~80%。
3. 我們建議使用一種吹風或者油霧。
4. 請根據實際切削條件調整速度、進給率及切削深度。
5. 在上述條件下操作傾斜角度 ( $\beta$ )  $\leq 2^\circ$  時，當KCRS進入Z軸裡，請降低進給速度30~60%。
6. 這些研磨條件適用於工具延長長度：少於 $4 \times D$ 。對於一個延長性長的工具來說，協調個別係數，降低速度、進給率及切削深度以防止吵雜聲。

### Tool extension coefficients 工具突出量係數

| Overshank Length<br>工具突出量 | Milling Speed<br>切削速度 | aa<br>軸方向切削 | Feed Speed<br>進給速度 |
|---------------------------|-----------------------|-------------|--------------------|
| L/D $\leq 4$              | 100                   | 100         | 100                |
| L/D $\leq 5$              | 80~100                | 70~90       | 80~90              |
| L/D $\leq 6$              | 60~80                 | 50~70       | 60~80              |



產品規格表 **P288**  
Specification page

## RD Cutting Condition 切削條件表

| Work Material<br>加工材質                  | Hardness<br>硬度 | Cutting Speed<br>切削速度 | Feed<br>進給 | Feed per Tooth 進給 fz(mm /tooth) |          |          |          |         |
|--|----------------|-----------------------|------------|---------------------------------|----------|----------|----------|---------|
|  |                |                       |            | Diameter 直徑 ØD (mm)             |          |          |          |         |
|  |                | (m/min)               | fz(mm/t)   | 2.5R                            | 3.5R     | 5R       | 6R       | 8R      |
| Carbon Steel<br>碳素鋼                    | HB 160~260     | 140~200               | 0.15~0.35  | 0.1~0.5                         | 0.15~1.  | 0.2~1.   | 0.5~1.5  | 0.5~2.  |
| Pre-Hardened Steel<br>預硬鋼              | HB 280~400     | 100~160               | 0.1~0.2    | 0.1~0.5                         | 0.15~0.8 | 0.2~1.   | 0.2~1.2  | 0.3~1.5 |
| Hardened steel<br>淬火鋼                  | HRC 40~52      | 80~120                | 0.1~0.15   | 0.07~0.2                        | 0.1~0.6  | 0.15~0.8 | 0.15~1.2 | 0.2~1.2 |
|  | HRC 52~63      | 60~80                 | 0.07~0.15  | 0.05~0.1                        | 0.05~0.2 | 0.07~0.5 | 0.1~0.8  | 0.15~1. |
| Stainless Steel<br>不銹鋼                 | HB 150~250     |                       | 0.1~0.15   | 0.1~0.3                         | 0.1~0.5  | 0.15~0.8 | 0.2~1.   | 0.2~1.2 |
| Gray Cast Iron<br>灰口鑄鐵                 | HB 170~300     | 120~185               | 0.12~0.3   | 0.1~0.5                         | 0.15~1.  | 0.2~1.   | 0.5~1.5  | 0.5~2.  |
| Aluminum Alloy<br>鋁合金( un-coating 無塗層) | HB 90~150      | 250~400               | 0.05~0.35  |                                 | 0.15~0.8 | 0.2~1.   | 0.5~1.5  | 0.5~2.  |
| Aluminum Alloy<br>鋁合金(TB coating 塗層)   |                | 300~700               | 0.05~0.35  |                                 | 0.15~0.8 | 0.2~1.   | 0.5~1.5  | 0.5~2.  |

產品規格表 **P295**  
Specification page

## ● WRH Cutting Condition 切削條件表

| Work Material<br>加工材質     | Hardness<br>硬度 | Cutting Speed<br>切削速度<br>(m/min) | Feed per Tooth 進給 fz(mm/tooth) |         |          |          |          |         |         |
|---------------------------|----------------|----------------------------------|--------------------------------|---------|----------|----------|----------|---------|---------|
|                           |                |                                  | Diameter 直徑 ØD (mm)            |         |          |          |          |         |         |
|                           |                |                                  | 10                             | 12      | 16       | 20       | 25       | 30      | 32      |
| Carbon Steel<br>碳素鋼       | HB 180~280     | 160~280                          | 0.3~0.4                        | 0.3~0.5 | 0.3~0.6  | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Alloy Steel<br>低合金鋼       | HB 180~280     | 200~320                          | 0.3~0.4                        | 0.3~0.5 | 0.3~0.6  | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Pre-Hardened Steel<br>預硬鋼 | HB 280~400     | 180~300                          | 0.2~0.4                        | 0.3~0.5 | 0.3~0.6  | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Die Steel<br>模具鋼          | HB 180~250     | 160~250                          | 0.2~0.4                        | 0.3~0.5 | 0.3~0.6  | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Hardened steel<br>淬火鋼     | HRC 40~55      | 140~220                          | 0.15~0.35                      | 0.2~0.4 | 0.2~0.5  | 0.25~0.6 | 0.25~0.6 | 0.3~0.8 | 0.3~0.8 |
|                           | HRC 56~63      | 120~180                          | 0.15~0.3                       | 0.2~0.4 | 0.2~0.5  | 0.35~0.7 | 0.25~0.5 | 0.3~0.6 | 0.3~0.6 |
| Stainless Steel<br>不銹鋼    | HB 150~250     | 100~220                          | 0.3~0.4                        | 0.2~0.4 | 0.25~0.5 | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Gray Cast Iron<br>灰口鑄鐵    | HB 160~260     | 300~400                          | 0.3~0.5                        | 0.4~0.6 | 0.5~0.7  | 0.5~0.8  | 0.6~0.8  | 0.8~1.  | 0.8~1.  |
| Ductile Cast Iron<br>球墨鑄鐵 | HB 170~300     | 240~300                          | 0.3~0.4                        | 0.3~0.4 | 0.3~0.6  | 0.5~0.8  | 0.5~0.8  | 0.6~0.8 | 0.6~0.8 |
| Copper Alloy<br>銅合金       | HB 80~150      | 220~320                          | 0.3~0.5                        | 0.4~0.5 | 0.4~0.6  | 0.35~0.7 | 0.4~0.8  | 0.5~0.8 | 0.5~0.8 |
| Aluminum Alloy<br>鋁合金     | HB 30~100      | 300~400                          | 0.3~0.5                        | 0.4~0.6 | 0.4~0.7  | 0.35~0.7 | 0.4~0.8  | 0.5~1.  | 0.5~1.  |
| Graphite<br>石墨            | -              | 400~550                          | 0.3~0.5                        | 0.4~0.6 | 0.4~0.8  | 0.35~0.7 | 0.4~0.8  | 0.5~1.  | 0.5~1.  |

## ■ Cutting Condition Method 球刀片計算圖

### 轉速

Rotation speed

$$N = \frac{V \times 1000}{\pi \times D_e} \text{ (min)}^{-1}$$

$$D_e = 2 \times \sqrt{A_p \times (D - A_p)} \text{ (mm)}$$

### 進給

Feed rate

$$F = N \times f_z \text{ (mm/min)}$$

$$f_z = h_{max} \times \frac{D}{\sqrt{A_p \times (D - A_p)}} \text{ (mm/rev)}$$

N = 轉速 (min)<sup>-1</sup>  
Rotation speed

V = 切削速度 (mm/min)  
Cutting speed

D<sub>e</sub> = 有效刀具直徑 (mm)  
Cutting length of diameter

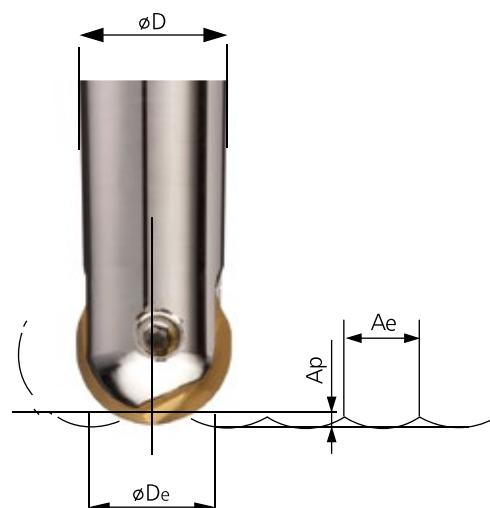
A<sub>p</sub> = 軸向切深 (mm)  
Depth of cut (ap)

A<sub>e</sub> = 步距/徑向切深 (mm)  
Depth of cut (ae)

F = 進給速度 (mm/min)  
Feed rate

f<sub>z</sub> = 每轉進給 (mm/rev)  
Feed rate of rotation speed

h<sub>max</sub> = 有效刀具直徑 (mm/min)  
Cutting length of diameter



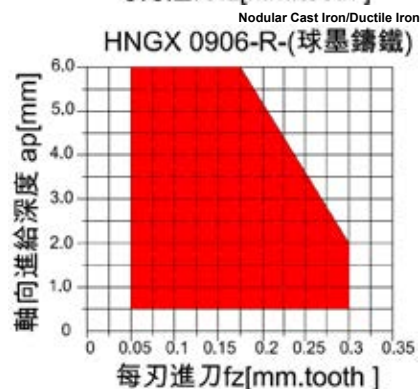
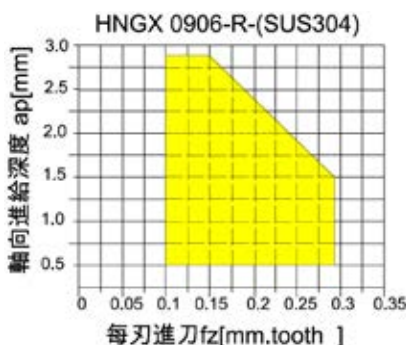
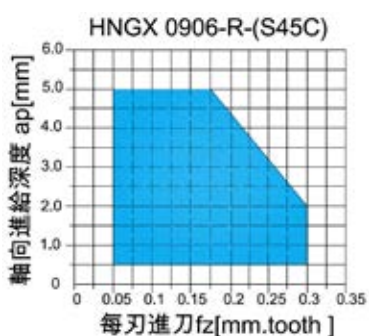
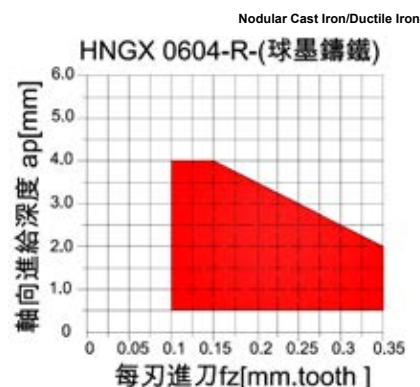
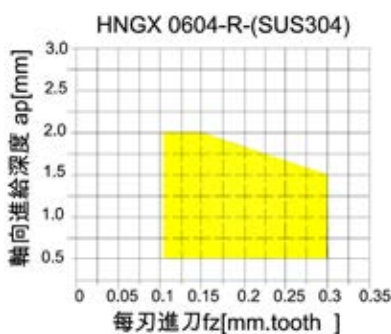
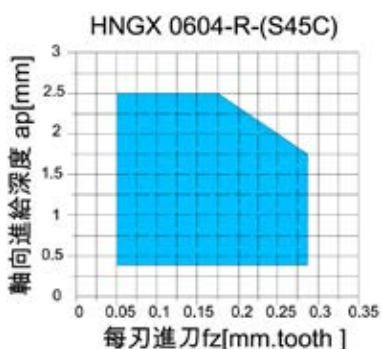
Unit/單位: mm

產品規格表 **P302**  
Specification page

## ● HN Cutting Condition 切削條件表

HNGX

| Item Code<br>規格碼 | Cutting Condition<br>切削條件參數 |            | ISO Standard for Carbide Tools (Application Range)<br>ISO碳化物切削刀具標準(適用切削材料範圍) |            |            |
|------------------|-----------------------------|------------|--|------------|------------|
|                  |                             |            | P  | M          | K          |
| HNGX0604-R-4225  | 每刃進給(Fz)                    | [mm/tooth] | 0.05 ~ 0.27  | 0.1 ~ 0.3  | 0.1~0.35   |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5~2.5  | 0.5~ 2.0   | 0.5 ~ 4    |
|                  | 切削速度(Vc)                    | [m/min]    | 200 ~250   | 60 ~ 100   | 135 ~ 182  |
| HNGX0906-R-4225  | 每刃進給(Fz)                    | [mm/tooth] | 0.1~ 0.3   | 0.1 ~ 0.27 | 0.3 ~ 0.5  |
|                  | 軸向進刀量(Ap)                   | [mm]       | 1.0 ~ 5.0  | 1.0 ~ 2.7  | 0.05 ~ 0.3 |
|                  | 切削速度(Vc)                    | [m/min]    | 160 ~230   | 60 ~ 90    | 168 ~ 224  |
| HNGX0604-R-3225  | 每刃進給(Fz)                    | [mm/tooth] | 0.1 ~ 0.27   | 0.1 ~ 0.3  | 0.1~0.35   |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5~2.5  | 0.5~ 2.0   | 0.5 ~ 4    |
|                  | 切削速度(Vc)                    | [m/min]    | 200 ~250   | 60 ~ 100   | 135 ~ 182  |
| HNGX0906-R-3225  | 每刃進給(Fz)                    | [mm/tooth] | 0.1~ 0.3   | 0.1 ~ 0.27 | 0.3 ~ 0.5  |
|                  | 軸向進刀量(Ap)                   | [mm]       | 1.0 ~ 5.0  | 1.0 ~ 2.7  | 0.05 ~ 0.3 |
|                  | 切削速度(Vc)                    | [m/min]    | 160 ~230   | 60 ~ 90    | 168 ~ 224  |



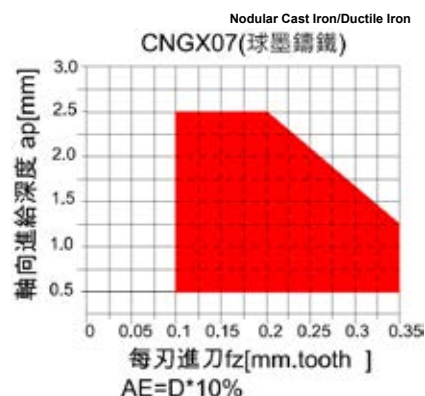
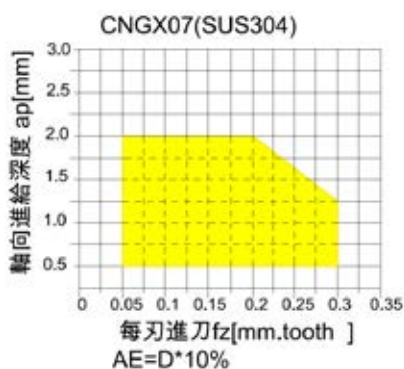
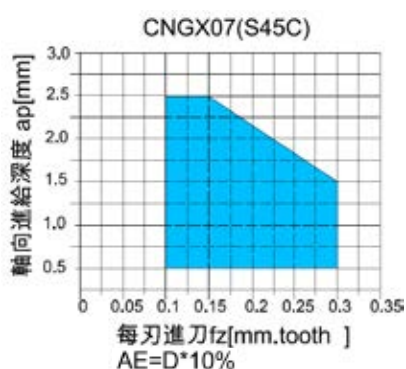
Unit/單位: mm

產品規格表 **P308**  
Specification page

## ● CN Cutting Condition 切削條件表

CNGX

| Item Code<br>規格碼 | Cutting Condition<br>切削條件參數 |            | ISO Standard for Carbide Tools (Application Range)<br>ISO 碳化物切削刀具標準 (適用切削材料範圍) |            |            |
|------------------|-----------------------------|------------|--|------------|------------|
|                  |                             |            | P  | M          | K          |
| CNGX07-3225      | 每刃進給(Fz)                    | [mm/tooth] | 0.10 ~ 0.3   | 0.05 ~ 0.3 | 0.1 ~ 0.35 |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5 ~ 2.5  | 0.2 ~ 2    | 0.5~2.5    |
|                  | 切削速度(Vc)                    | [m/min]    | 140 ~ 196  | 70 ~ 112   | 150 ~ 200  |
| CNGX07-4225      | 每刃進給(Fz)                    | [mm/tooth] | 0.10 ~ 0.3   | 0.05 ~ 0.3 | 0.1 ~ 0.35 |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5 ~ 2.5  | 0.2 ~ 2    | 0.5~2.5    |
|                  | 切削速度(Vc)                    | [m/min]    | 140 ~ 196  | 70 ~ 112   | 150 ~ 200  |
| CNGX07-3220      | 每刃進給(Fz)                    | [mm/tooth] | 0.10 ~ 0.3   | 0.05 ~ 0.3 | 0.1 ~ 0.35 |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5 ~ 2.5  | 0.2 ~ 2    | 0.5~2.5    |
|                  | 切削速度(Vc)                    | [m/min]    | 140 ~ 196  | 70 ~ 112   | 150 ~ 200  |
| CNGX07-4220      | 每刃進給(Fz)                    | [mm/tooth] | 0.10 ~ 0.3   | 0.05 ~ 0.3 | 0.1 ~ 0.35 |
|                  | 軸向進刀量(Ap)                   | [mm]       | 0.5 ~ 2.5  | 0.2 ~ 2    | 0.5~2.5    |
|                  | 切削速度(Vc)                    | [m/min]    | 140 ~ 196  | 70 ~ 112   | 150 ~ 200  |



**PDSTS**

產品規格表 **P278**  
Specification page

**PDST**

產品規格表 **P314-317**  
Specification page

## ● PDSTS,PDST Series Cutting Conditions 標準切削

| Work Material<br>被削材   | Mild steels, Carbon steels,<br>cast iron |                               | Alloy steels, Tool steels, SCM,<br>SKT, SKS, SKD ~HRC30 |                               | 鑄鐵 FC250等<br>一般構造鋼, 碳素鋼              |                               | Aluminum alloy, expanding<br>material |                               |
|------------------------|--|-------------------------------|---|-------------------------------|--------------------------------------|-------------------------------|---------------------------------------|-------------------------------|
| Diameter<br>直徑<br>(mm) | Speed<br>迴轉速<br>(min <sup>-1</sup> )     | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )                    | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> ) | Feed Rate<br>進給速度<br>(mm/min) | Speed<br>迴轉速<br>(min <sup>-1</sup> )  | Feed Rate<br>進給速度<br>(mm/min) |
| 3                      | 5300                                     | 160                           | 3200  | 95                            | 5300                                 | 160                           | 8000                                  | 300                           |
| 4                      | 4000                                     | 160                           | 2400  | 90                            | 4000                                 | 160                           | 6000                                  | 300                           |
| 5                      | 3200                                     | 160                           | 1900  | 90                            | 3200                                 | 160                           | 4800                                  | 300                           |
| 6                      | 2600                                     | 160                           | 1600  | 85                            | 2700                                 | 160                           | 4000                                  | 300                           |
| 8                      | 2000                                     | 150                           | 1200  | 75                            | 2000                                 | 150                           | 3000                                  | 300                           |
| 10                     | 1600                                     | 145                           | 960   | 65                            | 1600                                 | 145                           | 2400                                  | 300                           |
| 12                     | 1300                                     | 130                           | 800   | 60                            | 1300                                 | 130                           | 2000                                  | 300                           |
| 16                     | 1000                                     | 120                           | 600   | 60                            | 1000                                 | 120                           | 1500                                  | 300                           |
| 20                     | 800                                      | 110                           | 480   | 55                            | 800                                  | 110                           | 1200                                  | 300                           |

RE

產品規格表 **P318**  
Specification page

REC

產品規格表 **P319**  
Specification page

● RE/REC Series Cutting Condition 標準切削

| 被切削材<br>Work Material | 一般構造用鋼<br>Structural Steels<br>SS400 | 炭素鋼<br>Carbon Steels<br>S45C, S50C | 鑄鐵、合金鋼<br>Cast Iron, Alloy<br>Steels<br>FC, FCD, SCM, SKD | 調質鋼<br>Hardened Steels |                  | 不鏽鋼<br>Stainless Steels<br>SUS304 |
|-----------------------|--------------------------------------|------------------------------------|---|------------------------|------------------|-----------------------------------|
|                       |                                      |                                    |   | HRC30~40               | ~HRC50           |                                   |
| 切削速度<br>Cutting Speed | 8~20 m/min                           | 9~15 m/min                         | 8~15 m/min  | 5~12 m/min             | 5~10 m/min       | 5~10m/min                         |
| 刃徑<br>Dia.<br>(mm)    | Removal Amount<br>(mm/Dia.)          | Feed<br>(mm/rev)                   | Feed<br>(mm/rev)  | Feed<br>(mm/rev)       | Feed<br>(mm/rev) | Feed<br>(mm/rev)                  |
| 5                     | 0.1~0.2                              | 0.05~0.1                           | 0.08~0.15   | 0.05~0.1               | 0.05~0.1         | 0.05~0.1                          |
| 10                    | 0.2~0.3                              | 0.1~0.3                            | 0.1~0.3   | 0.1~0.3                | 0.1~0.2          | 0.1~0.2                           |
| 15                    | 0.3~0.5                              | 0.2~0.4                            | 0.3~0.5   | 0.15~0.35              | 0.1~0.3          | 0.15~0.35                         |
| 20                    | 0.3~0.5                              | 0.3~0.5                            | 0.3~0.5   | 0.2~0.4                | 0.15~0.35        | 0.2~0.4                           |

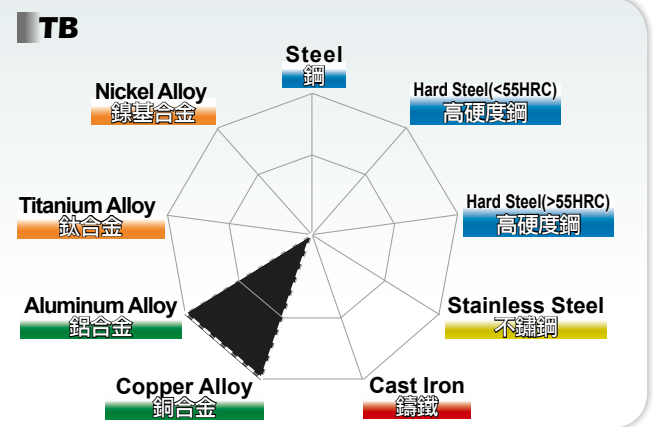
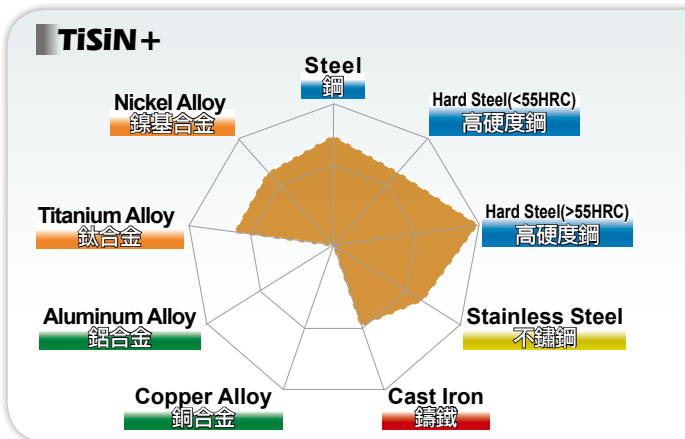
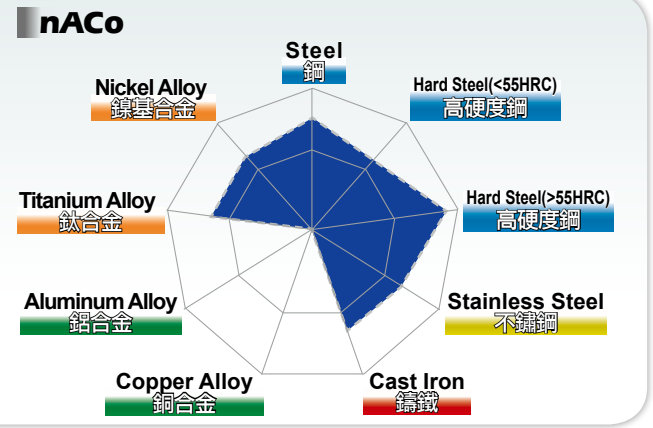
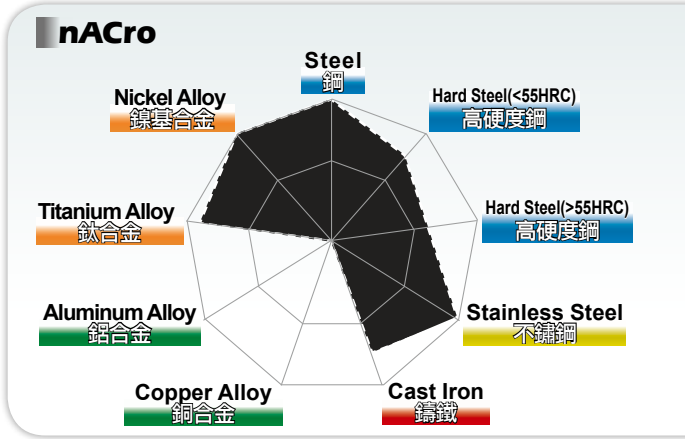
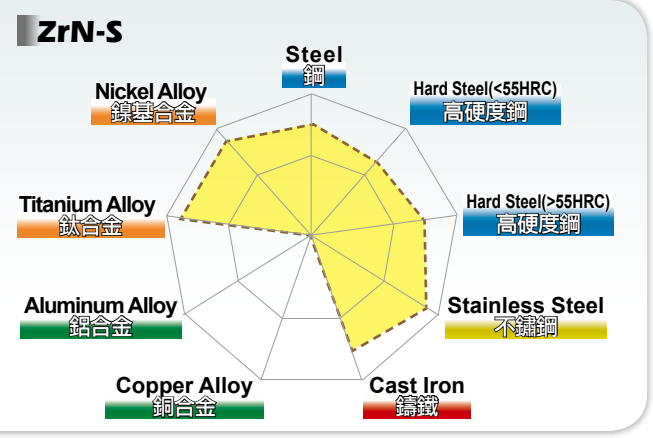
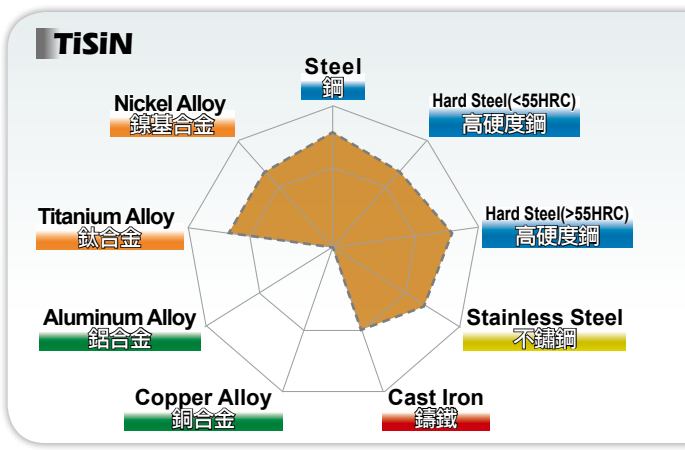
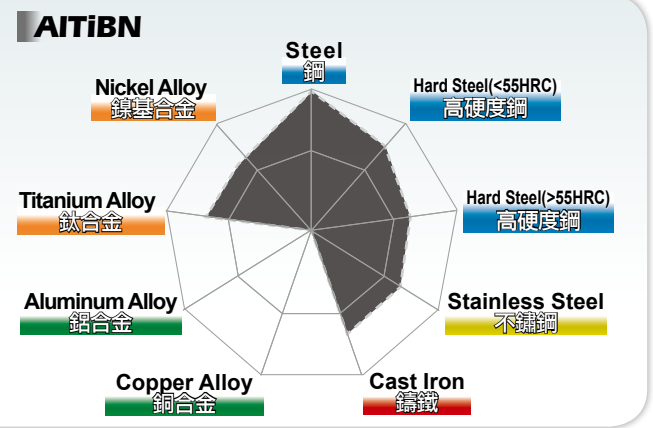
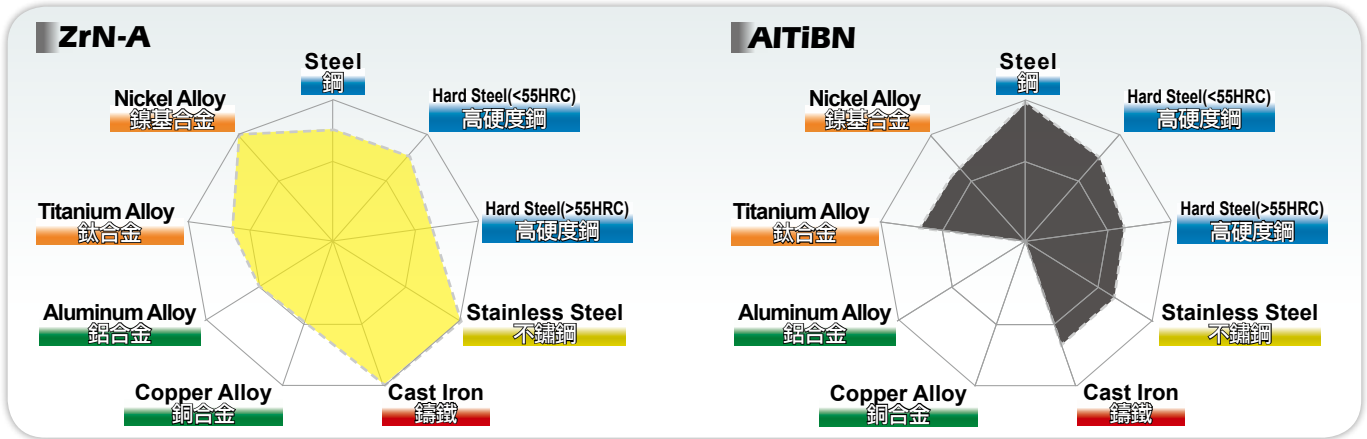


## ■ Coating Classifying and advantage 立銑刀的塗層種類及特點 *end mill expert*

| 項目<br>Item           | 塗層種類<br>Coating type   | ALTIBN     | TiSiN       | ZrN-A       | ZrN-S       | nACo      | TiSiN+      | P-nACo    | nACro      | SH<br>(AlTiSiN) | SS<br>(AlTiCrN) | RS<br>(CrSiSiN) | TB           |
|----------------------|--|------------|-------------|-------------|-------------|-----------|-------------|-----------|------------|-----------------|-----------------|-----------------|--------------|
| 特性<br>Characteristic | 表面硬度 (HV)<br>Hardness(HV)  | ~3400      | ~3600       | ~3400       | ~3600       | 45(Gpa)   | ~3600       | 47(Gpa)   | 42(Gpa)    | 3600            | 3300            | ~2800           | >6000        |
|                      | 塗層厚度 (μm)<br>Thickness(μm)   | 2~4        | 2~4         | 2~4         | 2~4         | 2~4       | 2~4         | 2~4       | 2~4        | 2~4             | 2~4             | 2~4             | <1           |
|                      | 耐氧化溫度 (°C)<br>Oxidation Temp.(°C)                                  | 900        | 1100        | 900         | 1100        | 1200      | 1100        | 1200      | 1100       | 1200            | 900             | 1000            | 500          |
|                      | 摩擦係數<br>Friction Coefficient                                       | 0.4        | 0.5         | 0.3         | 0.3         | 0.35      | 0.4         | 0.35      | 0.35       | 0.34            | 0.3             | 0.3             | <0.1         |
|                      | 顏色<br>Color  | 黑<br>Black | 棕<br>Copper | 金<br>Golden | 金<br>Golden | 藍<br>Blue | 棕<br>Copper | 藍<br>Blue | 銀灰<br>Gray | 金<br>Golden     | 銀<br>Sliver     | 銀<br>Sliver     | 金屬黑<br>Black |
| 適用材質<br>Application  | 碳鋼<br>Carbon Steel   | ◎          | ◎           | ◎           | ◎           | ◎         | ◎           | ◎         | ◎          | ◎               | ○               | ◎               | X            |
|                      | 工具高速鋼<br>High Speed Steel  | ◎          | ◎           | ◎           | ◎           | ◎         | ◎           | ◎         | ◎          | ◎               | ○               | ◎               | X            |
|                      | 不鏽鋼<br>Stainless Steel   | ○          | ○           | ◎           | ◎           | ○         | ○           | ○         | ◎          | ○               | ◎               | ◎               | X            |
|                      | 合金<br>Alloy  | ◎          | ◎           | ◎           | ◎           | ◎         | ◎           | ◎         | ◎          | ◎               | ○               | ○               | X            |
|                      | 銅 / 鋁<br>Copper / Aluminum   | X          | X           | X           | X           | X         | X           | X         | ○          | X               | X               | ○               | ◎            |
|                      | 高溫合金<br>Inconel  | ◎          | ◎           | ◎           | ◎           | ◎         | ◎           | ◎         | ○          | ◎               | ○               | ○               | X            |
|                      | 鈦合金<br>Titanium  | ○          | ○           | ◎           | ◎           | ○         | ○           | ○         | ○          | ○               | ○               | ○               | ◎            |
|                      | 塑膠 / 複合材料<br>/ 木材 / 紙<br>Plastic /<br>Composites /<br>Wood / Paper | X          | X           | X           | X           | X         | X           | X         | X          | X               | X               | X               | X            |
| 切削方式<br>Cutting Way  | 乾式<br>Dry Cutting  | ◎          | ◎           | ◎           | ◎           | ○         | ◎           | ○         | ◎          | ○               | ○               | ◎               | ○            |
|                      | 濕式<br>Wet Cutting  | ○          | ○           | ○           | ○           | ○         | ○           | ○         | ◎          | ○               | ◎               | ◎               | ◎            |
|                      | 油霧<br>Oil Spray  | ○          | ○           | ○           | ○           | ◎         | ○           | ◎         | ◎          | ◎               | ○               | ◎               | ○            |

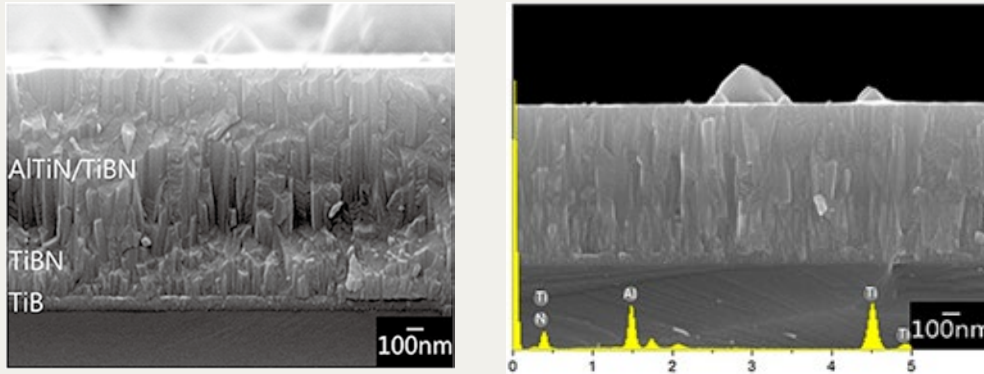
符號說明 Icon: ◎最適合 Recommend ○適合 Suitable X 不建議 Not Recommend  
如需代鍍服務，請洽 coating@speedtiger.com.tw





Introduction of AlTiBN Coating  
AlTiBN 塗層介紹

Coating Structural Analysis-SEM 薄膜結構分析-SEM

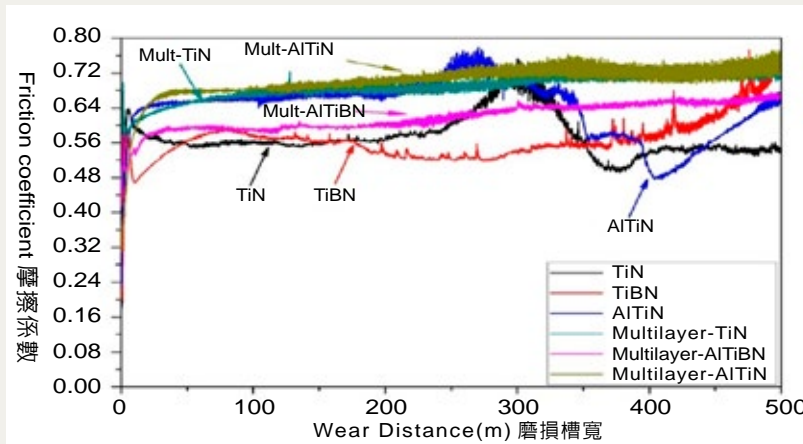


Normal Temperature - Mechanical Analysis 常溫-機械分析

|        | Hardness(Hv) | Impact of Diameter | Lc2-Lc1 | Wear Rate   | Roughness (μm) |
|--------|--------------|--------------------|---------|-------------|----------------|
| AlTiN  | 3672         | 305(um)            | 8.28N   | 6.49x10-6   | 0.233          |
| AlTiBN | 4088 ✓       | 280.9(um)          | 17.6N   | 5.11x10-6 ✓ | 0.166 ✓        |

In normal temperature mechanical analysis, the performance of AlTiBN is superior to AlTiN in hardness, wear rate and coating roughness.  
在常溫機械分析中，AlTiBN 在硬度、磨損率及薄膜粗糙度皆優於 AlTiN

The Oxidation Wear of 700°C 700°C的氧化磨耗



|            | Friction Coefficient<br>摩擦係數 | Wear Distance<br>磨損槽寬 | Wear rate<br>磨損率 |
|------------|------------------------------|-----------------------|------------------|
| TiN        | 0.5662                       | 316.3                 | 6.4x10-6         |
| TiBN       | 0.5664                       | 281.2                 | 5.69x10-6        |
| AlTiN      | 0.6402                       | 281.4                 | 4.97x10-6        |
| Mult-TiN   | 0.686                        | 277.4                 | 4.82x10-6        |
| AlTiBN     | 0.618                        | 281.8                 | 4.66x10-6 ✓      |
| Mult-AlTiN | 0.7014                       | 290.1                 | 5.5x10-6         |

The wear rate of AlTiBN at high temperatures is also superior to the above coatings.  
AlTiBN 在高溫下的磨損率優於上述其它塗層

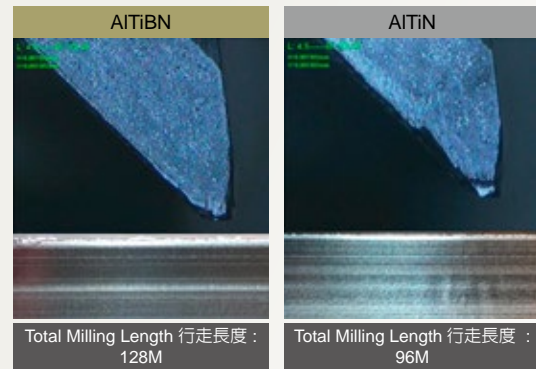
## Introduction of AlTiBN Coating

### AlTiBN 塗層介紹

#### Tool Life Comparison 壽命比較



#### Cutting Edges 刃部比較



#### Cutting Conditions 切削條件

|                   |                 |                    |               |
|-------------------|-----------------|--------------------|---------------|
| Milling Type 銑削方式 | Side Milling 側銑 | Feed Rate 進給速度     | 1082mm/min    |
| Work Piece 工件材料   | S45C            | Depth of Cut 切深    | ap=20 ae=1.2  |
| Tool Size 刀具尺寸    | 10mm x 30 x 75L | Coolant Way 冷卻方式   | Air 空冷        |
| Rotation Speed 轉速 | 3183 rpm        | CNC Machine CNC 機台 | YCM 永進 FV102A |

# AlTiBN

trademark



本產品已註冊德國商標註冊號：017926662  
Germany trademark No. 017926662



本產品已註冊台灣商標註冊號：01911574  
Taiwan trademark No. 01911574



本產品已註冊台灣商標註冊號：01912738  
Taiwan trademark No. 01912738



本產品已註冊日本商標註冊號：6134637  
Japan trademark No. 6134637

■ **ZrN-A** Coating 氮化鋯複合塗層

Technical Data

Details 產品特點

Block resistance 抗沾黏

- Suitable for High Speed machining with both dry and wet cutting way.  
用於乾濕式高速機加工

Good for Stainless steel cutting 不鏽鋼切削

- Hardness 2800~3000 HV 硬度
- Coefficient of friction: 0.3 磨擦係數
- Oxidation Temp 抗氧化溫度: 800~900° C
- High performance coating (Light golden) 高性能薄膜 (淡金色)



實測比較 - SUS316開槽

| PVE1004(AITIBN) 塗層優化加 ZrN 測試比較 |                   |  |
|--------------------------------|-------------------|--|
| 刀具使用前                          | PVE1004T (AITIBN) |  |
|                                |                   |  |
|                                |                   |  |
|                                | PVE1004T (ZrN-A)  |  |
|                                |                   |  |
|                                |                   |  |

| Parameter 綜合參數                    |                             |
|-----------------------------------|-----------------------------|
| Tool (Coating) 測試刀款               | PVE1004 ZrN-A               |
| Cutting Material 切削材質             | SUS316                      |
| Rotation Speed (S) 轉速             | 2644 rpm                    |
| Milling Speed (Vc) 切削速度           | 100 m/min                   |
| Feed Rate (F) 進給速度                | 646 mm/min                  |
| Depth of cut 切深                   | ap=10mm / ae=10mm           |
| (Fz) Feed of teeth 每刃進給量          | 0.062                       |
| Machine 使用機台                      | YCM FV102A 永進               |
| Holder 刀桿                         | BT40 Shrink fit holder 燒結刀桿 |
| "The length of Tool Extend 刀具伸出長度 | 37mm                        |
| Cooling Way 冷卻方式                  | Water 水冷                    |

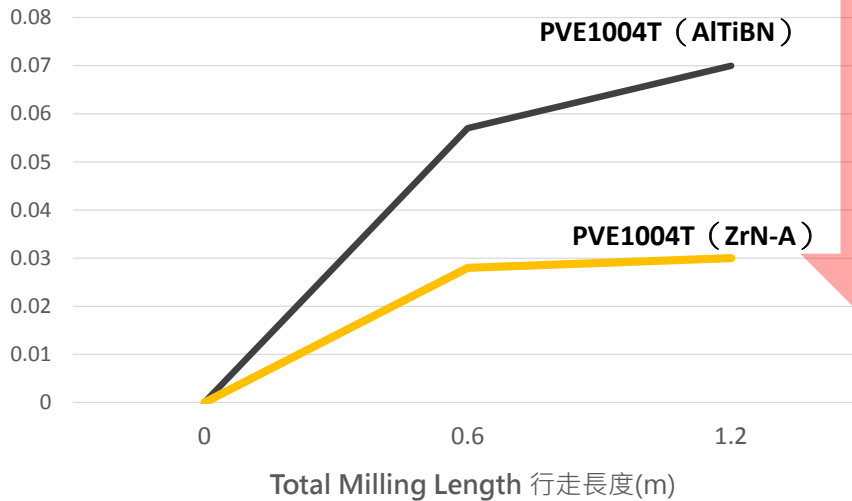
## Cutting Performance - SUS316 Slotting 開槽實測比較

| Item 項目                    |        | PVE1004T (AlTiBN) |  |  | Work urface 切面 | Iron Chip 鐵屑 | Load 負載值                 |
|----------------------------|--------|-------------------|--|--|----------------|--------------|--------------------------|
| Total Milling Length 切削總長度 | 0.6m 米 |                   |  |  |                |              | Load of Spindle 主軸負載 40% |
|                            | 1.2m 米 |                   |  |  |                |              | Load of Spindle 主軸負載 42% |
| Item 項目                    |        | PVE1004T (ZrN+A)  |  |  | Work urface 切面 | Iron Chip 鐵屑 | Load 負載值                 |
| Total Milling Length 切削總長度 | 0.6m 米 |                   |  |  |                |              | Load of Spindle 主軸負載 41% |
|                            | 1.2m 米 |                   |  |  |                |              | Load of Spindle 主軸負載 41% |

Serious broken cutting edge 刀具多處崩裂  
 Some Burr 中度毛刺  
 Serious jagged iron chips 鐵屑多處鋸齒狀  
 Slight broken cutting edge 刀具輕微崩裂  
 Slight burr 輕微毛刺  
 Slight jagged iron chips 鐵屑輕微鋸齒狀

Wear 磨耗(μm)

Tool life Comparison 壽命比較



| Parameter 綜合參數                    |                             |
|-----------------------------------|-----------------------------|
| Tool (Coating) 測試刀款               | PVE1004 ZrN-A               |
| Cutting Material 切削材質             | SUS316                      |
| Rotation Speed (S) 轉速             | 2644 rpm                    |
| Milling Speed (Vc) 切削速度           | 100 m/min                   |
| Feed Rate (F) 進給速度                | 646 mm/min                  |
| Depth of cut 切深                   | ap=10mm / ae=10mm           |
| (Fz) Feed of teeth 每刃進給量          | 0.062                       |
| Machine 使用機台                      | YCM FV102A 永進               |
| Holder 刀桿                         | BT40 Shrink fit holder 燒結刀桿 |
| "The length of Tool Extend 刀具伸出長度 | 37mm                        |
| Cooling Way 冷卻方式                  | Water 水冷                    |

| Coating 塗層 | 0.6m     | 1.2m    |
|------------|----------|---------|
| ALTIBN     | 0.057 μm | 0.07 μm |
| ZrN-A      | 0.028 μm | 0.03 μm |

# TiSiN Coating

# Technical Data

New Nano-composite coating material achieves extraordinary heat resistance and hardness. This is attained due to the new composite layer, consisting of nano-crystal material (Oxidizing temperature : 1100°C, Layer hardness : HV 3600).

Achieves extraordinary performance in high-speed cutting, and high efficient machining of hardened steel, machining efficiency is more than twice as effective as other manufacturers solid carbide end mills.

Ensuring long life and reliability in hardened steel applications HRC45~55 material examples : 1.2080, 1.2344, and 1.2379, ASP Power Steels, High Speed Steels.

The coating generates less heat during cutting; therefore it is well suited to dry machining conditions.

Newly developed TiSiN Coating has excellent oxidation-resistant properties, this achieves : High speed cutting of hard steels = High Efficiency

Improvement in tool life = Lower tooling costs The newly designed flute geometry increases rigidity, with the improved high radius accuracy producing higher tolerance, and smoother surface finish.

Direct Milling of hardened steel is now possible = Faster production times.



Patent of Taiwan No: I 280288  
(the method of tool surface hardening)  
本產品已獲台灣一種刀具表面硬化方法之專利證書字號：I 280288

## 塗層介紹

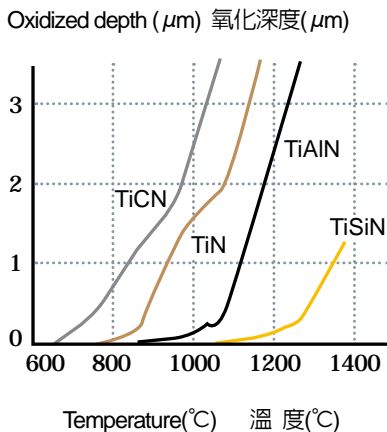
新式的TiSiN 塗層 適合於各種的切削環境。

更高的薄膜硬度，更細緻的表面，提高刀具的壽命。

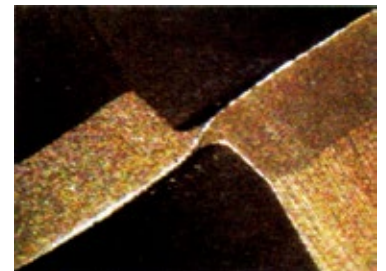
加入了矽原子，使表面更加的平滑，更提高了薄膜的抗氧化溫度 (≥1100°C)

特殊的鍍膜製程，使層積的表面更加緊實，表面硬度更高達 ≥3600HV

特殊的刀形設計，加上 TiSiN 塗層，更提高了刀具的耐磨耗性，和優秀的續航能力



market standard High performance  
市售高性能刀具



SI hard coating  
SI 硬質塗層刀具

# nACRo Coating

# Technical Data

## nACRo Nanocomposite coating process. nACRo 奈米制程

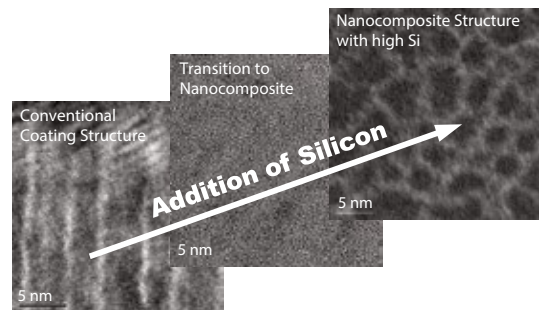
1. contain Si membrane, oxidation start temperature : 1,100°C.
2. nano grade coating, better surface finish.
3. extremely high nano hardness, extremely high adhesion.
4. better protection for tools, reduction of production cost, economical environmentally manufacturing.

- 含矽薄膜，切削氧化溫度高達1100°C。  
奈米級塗層，表面更加細緻。  
超高硬度，超高附著力。  
多層陶瓷結構，保護性更佳性，切削更環保，更節省成本。

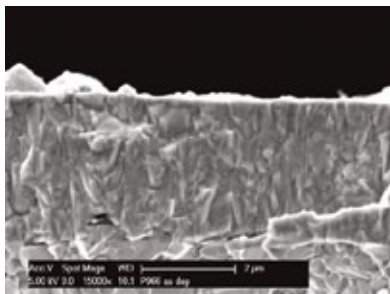
By deposition very different kinds of materials, the components (like Ti, Cr, Al in the first group, and Si in the other) are not mixed completely, and 2 phases are created. The nanocrystalline TiAlN- or AlCrN-grains become embedded in the amorphous SiN-matrix and the nano-composite structure develops.

Silicon increases the toughness and decreases the internal residual stress of the coating.

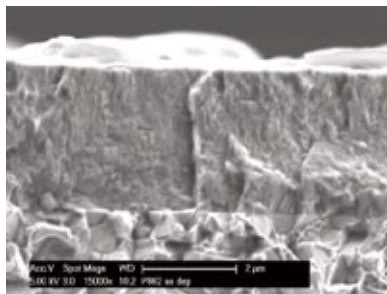
The increasing of the hardness is generated by the structure only, the SiN matrix enwraps the hard grains and avoids growing of their size.



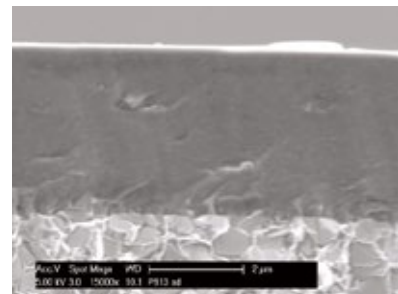
**不含矽: AlCrN**  
No Silicon: AlCrN



**低含矽: AlCrN / SiN**  
Low Silicon: AlCrN / SiN

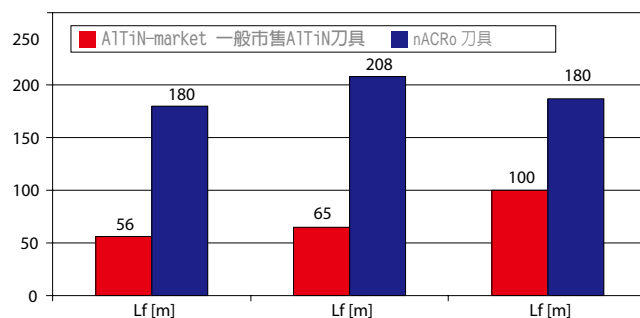


**高含矽: nACRo**  
High Silicon: nACRo



Carbide End Mills Ø10mm, z=4, steel 34CrNiMo6 (30 HRC), Coolant: Air; Minimum lubrication - Tested tools: 2x4  
Source: Carmex, Maalot, ISR

**Tool Life Comparison 刀具使用壽命比較**



# nACRo Coating

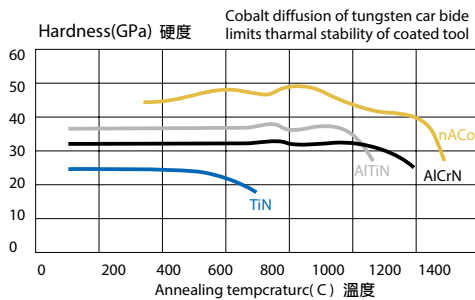
# Technical Data

## nACo Nanocomposite coating process. nACo奈米制程

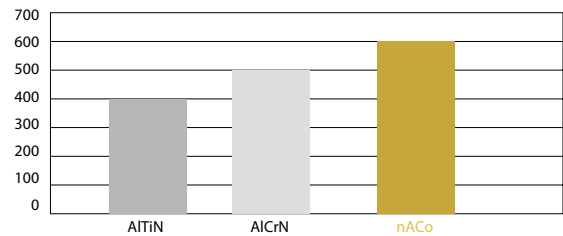
1. Perfect coating structure.
2. High hardness.
3. High adhesion.
4. Adding Si into nACo structure makes atom structure more completed with high hard-wearing and tools with more longer life.

1. 更完整的薄膜結構。
2. 超高硬度。
3. 高附著力。
4. nACo的結構中加入Si，使其原子結構更加完整，更具耐磨耗性，使工具有更長的壽命。

### Heat Resistance Comparison 熱阻抗比較



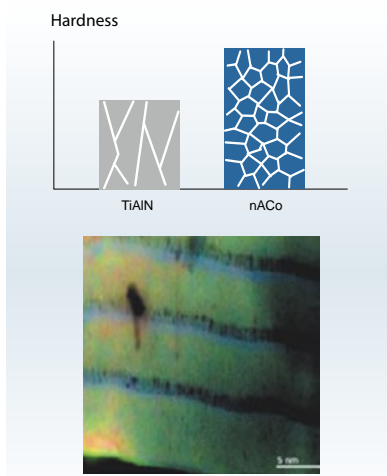
### Tool Life Comparison 刀具壽命比較



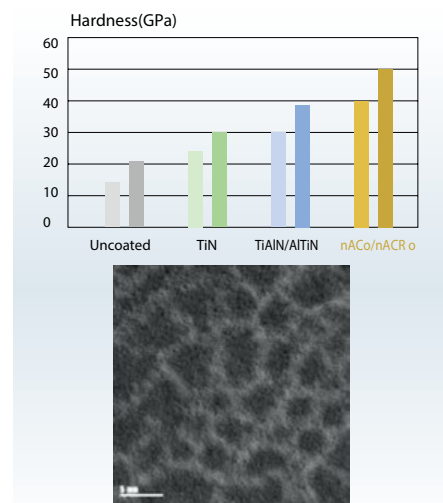
### AlTiN v.s nACo 的比較

| S.T Coating | Typical Thickness(µg)<br>膜厚 | Nanohardness up to (GPa)<br>硬度 | Max Service Temp(°C)<br>氧化溫度 | Friction coefficient<br>摩擦係數 |
|-------------|-----------------------------|--------------------------------|------------------------------|------------------------------|
| AlTiN       | 2~4                         | 35                             | 800                          | 0.6                          |
| nACo        | 2~4                         | 45                             | 1200                         | 0.35                         |

### Hardness Increase through Nanocomposites



Conventional Nanolayer-Structure : (TiAlN)(TiN)  
一般 (TiAlN) (TiN) 的微視組織



Nanocomposite structure : (nc- TiAlN)/(a-Si3N4)  
nACo 的微視組織



## ■ TB Coating

## Technical Data

## Tetrabond Diamond Coating TB超硬類鑽膜

## A different type of DLC 並不是一般的類鑽膜

Super high lubrication & Super low friction coefficient

New PVD Nano Technology

The tool is long life to be surprised because TB hardness to near the the nature diamond coating Swiss & Speed Tiger Technological Cooperation.

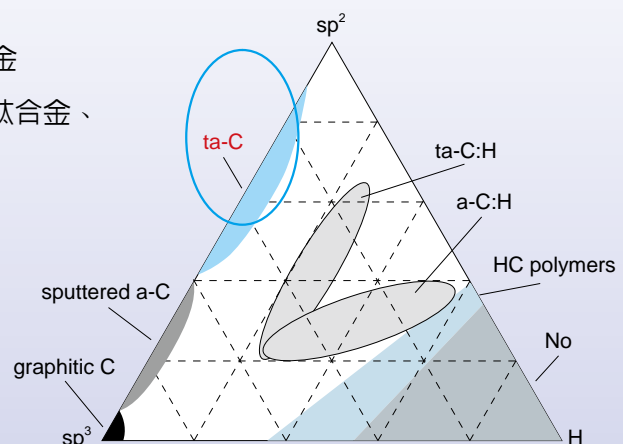
超高潤滑性·超低摩擦係數

最新奈米物理氣相沉積科技

超高硬度·超長壽命·惟有CVD鑽石薄膜可相比擬

泛虎與瑞士 Ionbond 技術合作開發

- Nano-composite coating which is improved the lubricative property without making the abrasive property lower by new coating material of nano-crystal.
- Excellent cutting is reached in machining non-ferrous materials, especially in aluminum with over six multiple in machining efficiency. Long tool life and precision machining in PCB boards, Brass, Titanium, Ceramics, Fiberglass etc.
- Dry cutting applicable, because of less cutting heat by improving friction property very much and wet cutting applicable.
- 奈米複合塗層採用奈米晶格靶材，大幅改善潤滑效果，有效的降低摩擦係數並且維持更好的耐摩耗性。
- 出色地應用在非鐵金屬加工，尤其是在鋁合金加工效率在6倍以上，並且在PCB板、銅、鈦合金、陶瓷形成超長刀具壽命和高品質加工。
- 摩擦係數大幅改善，形成較低的切削溫度，所以乾式切削可行，濕式切削亦可行。



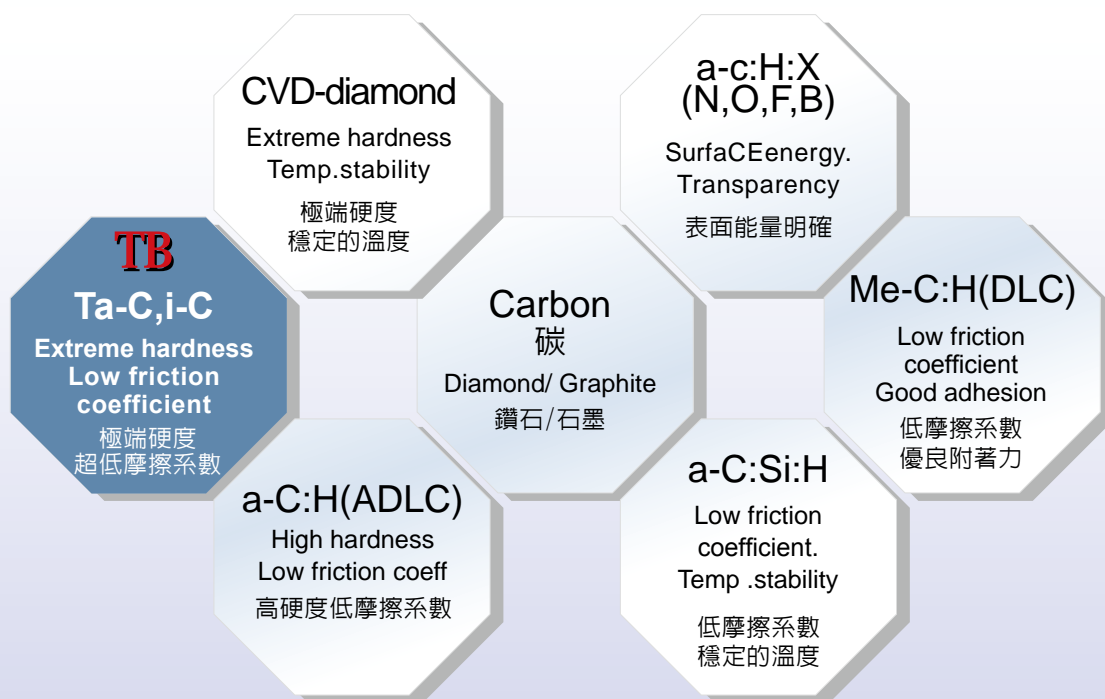
## TB Coating

## TB超硬類鑽膜 系列

DLC coatings are generally deposited by five methods, each having different properties :  
 DLC 薄膜有5種不同的沉積方法，而每一個各有不同的特性：

|                         |       | TB Ta:C            | PVD a:CH    | PVD Me:CH   | CVD        | PaCVD       |
|-------------------------|-------|--------------------|-------------|-------------|------------|-------------|
| Deposition temp         | 沈積溫度  | <b>under 150 C</b> | under 200 C | under 200 C | over 900 C | under 200 C |
| Range of substrates     | 基材限制  | Broad              | Broad       | Broad       | Limited    | Broad       |
| Oxidation temp          | 氧化溫度  | <b>500-1000 C</b>  | 350 C       | 300 C       | 700 C      | 300 C       |
| Adhesion                | 附著力   | <b>Very good</b>   | Good        | Very Good   | Excellent  | Good        |
| Smoothness              | 平滑度   | <b>Good</b>        | Very good   | Good        | Good       | Excellent   |
| Hardness (GPA)          | 硬度    | <b>60-95</b>       | 25          | 10-15       | 40-90      | 20-40       |
| Coefficient of friction | 摩擦係數  | <b>&lt;0.1</b>     | <0.1        | 0.15        | <0.4       | <0.1        |
| Hydrogenated            | 氫化    | <b>No</b>          | Yes or No   | Yes         | No         | Yes         |
| Metal content           | 金屬親和性 | <b>No</b>          | Yes         | Yes         | No         | No          |

All DLC coatings are not equal : especially on Hardness and Oxidation  
 各種類鑽膜都有不同的特性，尤其是硬度和氧化溫度



# TB Coating

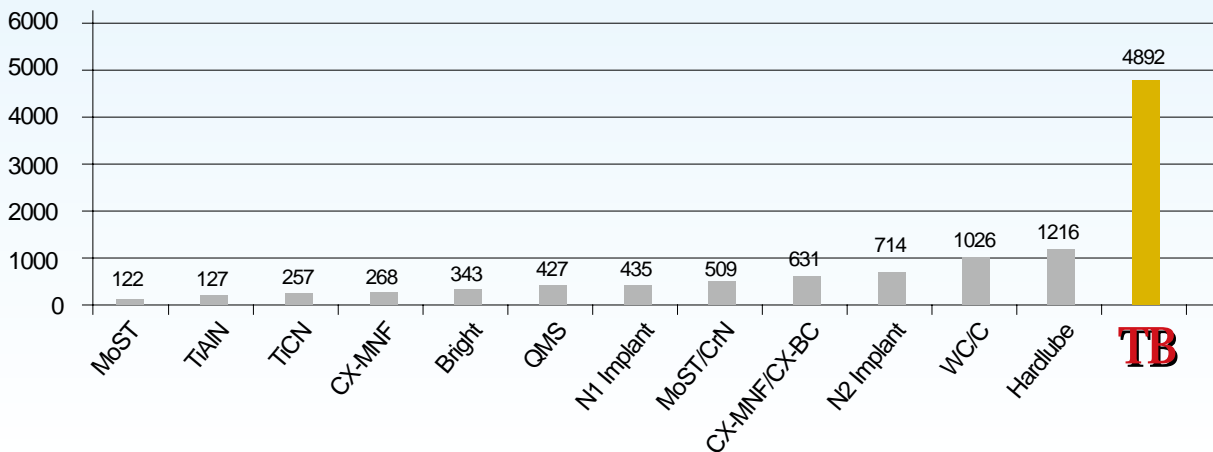
# Technical Data

## Performance and cost savings - Dry Drilling 節省成本和高性能 – 乾式鑽孔

Dry Drilling in A-319 Aluminum - pilot holes with cold-air 3500 rpm and 15 ipm / D13227A drills - Average number of holes.

鋁合金 (A-319) 乾式鑽孔 – 氣冷 – 3500rpm – 15ipm/D13227A – 平均鑽孔數

TB exhibits outstanding performance in machining aluminum!\*  
TB塗層在加工鋁件有著優異的表現



## TetraBond Performance

### TB 類鑽石完美的表現在非鐵材質的加工

TETRABOND is an excellent choice for machining non-ferrous materials such as:

TB 類鑽石薄膜非常出色的表現在機器加工非鐵金屬材質上

- High silicon content aluminum alloys 高矽鋁合金
- Aluminum magnesium matrix materials 鋁合金
- Titanium 6Al4V 鈦金屬
- Epoxy resins 環氧樹脂
- Fiberglass and composites 玻璃纖維和合成
- Plastic 塑膠
- Graphite 石墨
- Brass and bronze 黃銅和青銅
- Ceramics... 陶瓷

## TB Coating

## TB超硬類鑽膜 系列

### TETRABOND Advantages.

#### TB 薄膜的優勢

- No substrate preparation required 不必特別選擇基材
- Suitable for HSS and carbide cutter 適合高速鋼和碳化鎢工具
- Able to strip and recoat without damaging the substrate 沒有任何有害物質，非常環保，且容易再塗層
- Thin coating maintains sharp edges 非常薄的膜厚可以保持工具銳利

### TETRABOND reduces manufacturing cost through:

#### TB類鑽石薄膜可以大幅降低製造業成本

|                               |   |                             |
|-------------------------------|---|-----------------------------|
| Higher Speeds & Feeds 高轉速和高進給 | → | Improve productivity 增加生產效率 |
| Reduced Tool Inventory 減少庫存工具 | → | Tool cost savings 降低工具成本    |
| Longer Tool Life 較長的工具壽命      | → | Reduced downtime 減少停機時間     |
| Improved Part Quality 精良的工件品質 | → | Less scrap 較少的毛邊            |

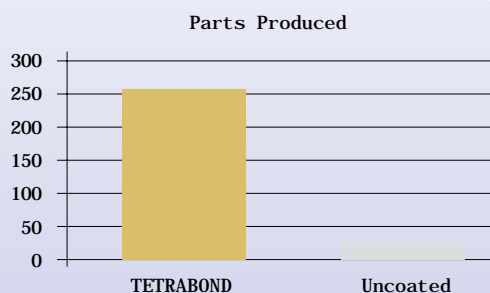
### Performance and cost savings Rough turning Titanium 6AL 4V

#### 性能和節省成本：鈦合金 6AL 4V的車削



Insert WNMG 431 T-F IC20 Work material : Titanium 6AL 4V  
刀片WNHG431 T-F IC20、被切削材質：Titanium 6AL 4V

- Speed : 800 rpm → 轉速：800 rpm
- Feed : 0.011 fpr → 進給：0.011 fpr
- Depth of cut : 0.080 inches → 深度：0.080 英吋



TETRABOND coated tools achieved over eight multiple tool life over uncoated tools  
相較其它無鍍層的刀具，TB塗層刀具效能多了8倍

## ■ RS Nano Coating 奈米塗層

## Technical Data

### Details 產品特點

#### 瞭解RS塗層 Feature of RS coating

- 抗熱 Oxidation start temperature : 1,000°C
- 硬度 Hardness: 2,800HV
- 摩擦係數 Coefficient of friction : 0.3
- 薄膜厚度 Thickness ( $\mu$ ) : 2~4  $\mu$
- 顏色 Color: 銀色 Silver
- 乾、濕式切削，加工軟材為一般AlTiN的  
2至3倍壽命。  
Dry and Wet Coolant , Cutting performance of soft  
material improved by 2~3 times than Altin Coating



#### CrSiN與CrN差別在何? Difference between CrSiN and CrN

- CrSiN: 含Si能夠細化CrN晶粒，甚至可達奈米等級，除具CrN一切優點外更可提高其硬度至30~40GPa，且耐熱溫度可達到1,000度。  
CrSiN Coating can improve the CrN grain to be reached NANO grade. Excepting the all advantage of CrN coating, it drastically improves the hardness to 30~40GPa and Oxidation start temperature:1,000°C
- CrN: 含Cr對鐵金屬的親和性相當低，大都不與鐵材產生反應，其真正潤滑性使鍍膜擁有不沾粘之特性且具備低摩擦係數，唯美中不足其硬度僅有17~20GPa且其耐熱溫度僅為700度。  
CrN coating with Cr element has low affinity with Fe material. It exhibits lower friction than that of conventional coating. But the Hardness only 17~20GPa and the Oxidation Start Temperature 700°C.

#### Rs塗層應用在哪? Application of RS

- 乾式加工 Dry Cutting
- 濕式加工 Wet Cutting
- 一般加工 General Cutting
- 高速加工 High Speed Cutting
- 鑄鐵、不鏽鋼、鈦合金、炭素鋼、銅、鋁...等幾乎包含所有被加工材  
Cast Iron, Stainless, Titanium Alloy, Carbon Steel, Copper, Aluminum

#### Rs塗層優點 Advantage of RS

- 大幅增加刀具、模具之使用壽命 Improve the tooling and mold life
- 增加製造良率 Improve productivity and product quality
- 提高工件表面品質 Better Surface finish
- 增加脫膜性 Mold Release forces
- 提高切削條件 Improved Cutting Condition

SH

**Super High Hardness  
& Super High Speed Cutting**

End Mill Series For High Hardness Steeles

高硬度鋼加工超長壽命  
 超高表面硬度 · 超高速加工  
 超高附著薄膜 · 超高硬度薄膜  
 震虎與瑞士 **Ion Bond** 技術合作開發

Long life for high hardness steel

Super high hardness, super high speed cutting

Super high adhesion coating & super high hardness coating

**SPEED TIGER** Super Coating SH

- 奈米複合塗層採用奈米晶格靶材，大幅改善附著效果，並且維持更低的摩擦係數。
- 非常出色地應用在塑膠模，尤其是在NAK鋼材加工效率在2倍以上，並且在合金鋼NAK、碳鋼形成超長刀具壽命和高品質加工。
- 摩擦係數大幅改善，形成較低的切削溫度，所以乾式切削可行，超高速切削亦可。
- Nano-composite coating which is improved the adhesion property without making the abrasive property lower by new coating material of nano-crystal.
- Excellent cutting is reached in machining plastic moulds, especially in NAK steels with over two times in machining efficiency. Long tool life and precision machining in carbon steels, alloy steels, NAK55 etc.
- Dry cutting applicable, because of less cutting heat by improving friction property very much and high speed cutting applicable.

**Swiss & SPEED TIGER**  
Technological Cooperation

## COMPARISON OF CHIP FORMATION



| Coating  | Material System | Application  | Typical Thickness (μ) | Hardness (HV) | Oxidation Temp. (°C) | Coefficient of Friction | Color  |
|----------|-----------------|--|-----------------------|---------------|----------------------|-------------------------|--------|
| A/TiN SH | Multilayer NaNo | High speed machining, High Hardness                  | 2~4                   | 3600          | 1200                 | 0.34                    | Golden |
| A/TiN SS | Multilayer NaNo | High speed machining, dry or wet cutting, soft steel | 2~4                   | 3300          | 900                  | 0.30                    | Silver |

### Why do we coat "Super Hard Altin"? We called SH Altin!

為什麼需要塗SH塗層？是因為SH塗層可以：

#### 降低客戶費用

- 提供顧客較長的刀具壽命
- 降低顧客製造產品時間
- 提昇刀具更高的進給速度，每小時更多的產能獻給顧客
- 減少或排除冷卻設備花費，並符合環境保護

#### 提高品質

- 更少的碎片

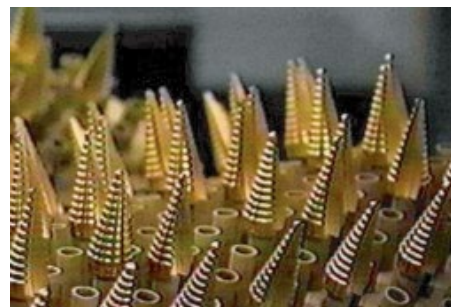
#### BFR demand coatings SH because SH coatings:

##### Reduce customers costs

- Longer tool life
- Less manufacturing down time
- Tools work faster / more production per hour
- Reduced tool inventories
- Reduction or elimination of coolants / release agents

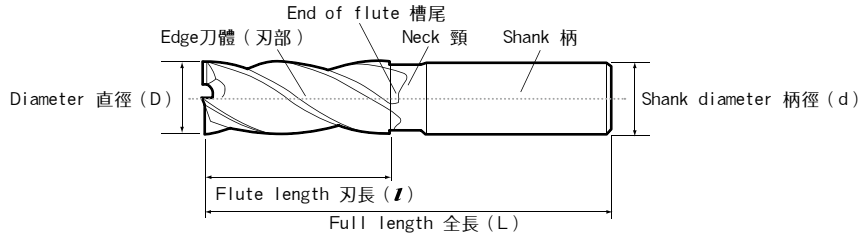
##### Improve quality

- Less scrap

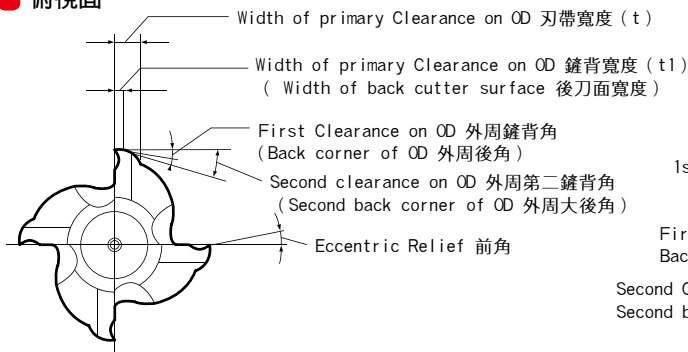


Detail of the end mill 立銑刀各部位名稱

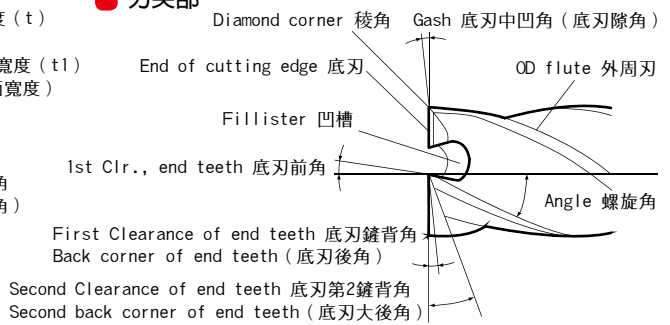
● 側視面



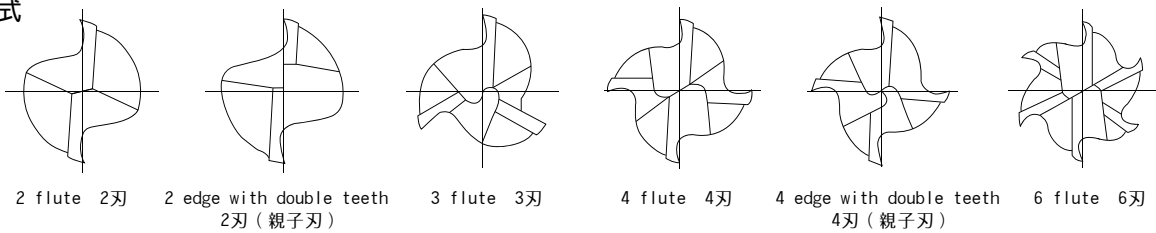
● 俯視面



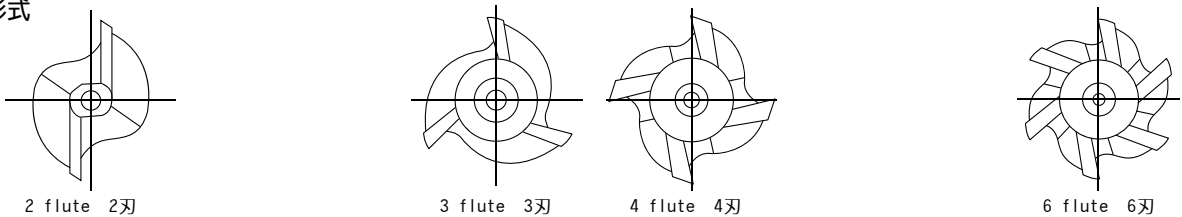
● 刃尖部



● 刀刃形式



● 刀刃形式

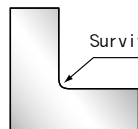


Shape in end teeth of the end mill 立銑刀的底刃形狀

● Tip protection 尖角保護



During the tip protection 尖角保護時



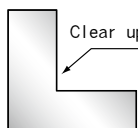
Survival surface of corner R角殘留面

- Batter rigidity of the tip, protecting the edge. 尖角部剛性好·不易崩刃。
- Tip sharp drop. 尖角部鋒利度下降。

● Tip 尖角



During the tip 尖角型時



Clear up tip 直角

- Use for clear up tipe. 工作直角時使用。
- Sharp tip, easy to break. 尖角部鋒利·但易崩刃。
- Can be use in carbone steel and steel, specially using in Aluminum and non-ferrous material. 碳素鋼和調質鋼也能使用·尤其廣泛應用於鋁材等非鐵材質的加工·對於高硬度的工件·因崩刃而無法適用。



## ■ End mill working condition calculation method

## 立銑刀加工中切削條件計算方法

## ■ 切削條件的計算公式

## ● 切削速度 (線速度)

Calculation VC

立銑刀刀刃圓周面上的某1點在每一分鐘內移動的距離，可通過下述公式求出。

$$V = \frac{\pi \times D \times N}{1000}$$

V = Cutting speed 切削速度 (m/min)

 $\pi = 3.14$  (圓周率)

D = Diameter 立銑刀刃徑 (mm)

N = Rotating speed 轉速 ( $\text{min}^{-1}$ )

## ● Rotation speed 轉速

Calculation of Rotation speed

裝夾立銑刀的機械主軸在每一分鐘內旋轉的轉數，可通過下述公式求出。

$$N = \frac{1000 \times V}{\pi \times D}$$

N = Rotating speed 轉速 ( $\text{min}^{-1}$ )

V = Cutting speed 切削速度 (m/min)

 $\pi = 3.14$  (圓周率)

D = Diameter 立銑刀刃徑 (mm)

## ● Feed rate 進給速度

Calculation of Feed rate

每一分鐘內工作台進給的速度，可通過下述公式求出。

$$F = N \times Z \times f$$

F = Feed rate 進給速度 (mm/min)

N = Rotating speed 轉速 ( $\text{min}^{-1}$ )

Z = Number of flute 立銑刀刀刃數

f = Feed rate of the flute 每刃進給量 (mm/1刃)

## ● Feed for teeth 每刃進給量

Calculation of the Feed of teeth

立銑刀刀刃圓周面上的某1點在每一分鐘內移動的距離，可通過下述公式求出。

$$f = \frac{F}{N \times Z}$$

f = Feed rate of the flute 每刃進給量 (mm/1刃)

F = Feed rate 進給速度 (mm/min)

N = Rotating speed 轉速 ( $\text{min}^{-1}$ )

Z = Number of flute 立銑刀刀刃數

## ● Working time 加工時間

Calculation of the Working time

切削工件材料所需的時間，可通過下述公式求出。

$$T_c = \frac{L}{F}$$

Tc = Working time 加工時間 (min)

L = Total working length 工作台總進給長度  
(工作材料長度+立銑刀刃徑D)

F = Feed rate 進給速度 (mm/min)



The standard Cutting Conditions published on each products page.

Cutting will be influenced by work piece, machine and software; the above-mentioned data are only for reference.

## Failure analyzed and solvent

| Item                           | Fault  | Reason   | Solution  |
|--------------------------------|--|--|---|
| ● Precision of cutting surface | ● Rough surface                                | ● Vibration  | ▶ Fix the working material as well as possible<br>▶ Adjust the failed part of machine<br>▶ Reduce rotating speed<br>▶ Downcut<br>▶ Tools minimum length out of fixture          |
|                                |  | ● The heterogeneity in hardness of working material                            | ▶ measuring the hardness of working material  |
|                                |  | ● The tip was unsuitable   | ▶ Tool rake angle and clearance angle<br>▶ Improve cutting roughness  |
|                                |  | ● Chip lump and fuse attach material   | ▶ Remove chip lump and fuse attach material<br>▶ Check on the degenerative condition of cutting fluids  |
|                                |  | ● Passivation of cutting edge  | ▶ Determine the adequate time to regrinding   |
|                                |  | ● Cutting rate (speed) too fast  | ▶ Reduce the cutting rate (speed)   |
|                                | ● Buckling cracking of the of machined surface | ● Misfit cutting fluids or deficient of cutting fluids                         | ▶ Change cutting fluids   |
|                                |  | ● Unbalance friction of cutting edge   | ▶ Regrinding to reduce friction   |
|                                |  | ● Fuse attach material on the cutting edge                                     | ▶ Remove fuse attach material<br>▶ Change cutting fluids  |
|                                | ● The corrugation of machined surface          | ● Cutting edge deformation   | ▶ To pay attention to use and safekeeping   |
|                                |  | ● lesser cutting flute   | ▶ Increase the number of Flutes from 2 Flutes to 4 Flutes and then 6 Flutes   |
|                                |  | ● Bigger cutting depth and feed rate   | ▶ To Reduce the Feed Rate of Machine  |
| ● Shape precision              | ● Perpendicularity                             | ● A larger Helix Angle   | ▶ Decrease the Helix Angle  |
|                                |  | ● Cutting depth and feed rate is too large                                     | ▶ Reduce the depth of cutting and feed rate   |
|                                |  | ● Tool stretches out over longer   | ▶ Use the end mill stretches out shortest from chuck  |
| ● End mill life                | ● Shorter life for regrinding end mill         | ● Perpendicularity of holder not reach   | ▶ Improve the perpendicularity of holder  |
|                                |  | ● Work material hardness too high  | ▶ Improve to suitable hardness by heat treatment process<br>▶ Reduce the feed rate for high hardness work material or change more hardness tool                                 |
|                                |  | ● Unsuitable feed rate   | ▶ Adjust to suitable feed rate  |
|                                |  | ● Chip lump and fuse attach material   | ▶ Remove chip lump and fuse attach material<br>▶ Use suitable cutting liquid  |
|                                | ● Huge friction of cutting edge                | ● Unsuitable cutting liquid  | ▶ Use suitable cutting liquid<br>▶ Use enough cutting liquid  |
|                                |  | ● The fault of work material   | ▶ Uchieve the average of inSide form of work material<br>▶ clear up unbalance hardness  |
|                                |  | ● Unsuitable edge angle  | ▶ Regrind to suitable angle   |
|                                |  | ● End mill cutting function go down  | ▶ Surface treatment   |
|                                |  | ● Unsuitable cutting liquid  | ▶ Adjust to suitable cutting liquid<br>▶ Adjust offer method of liquid  |
|                                | ● Flute damage                                 | ● Unsuitable regrind schedule  | ▶ Manage the regrind schedule   |
|                                |  | ● Vibration  | ▶ Strengthen the install tool of work material  |
|                                |  | ● The fault of work material   | ▶ Achieve the average of working material structure<br>▶ Use suitable hardness , clear up unbalance hardness<br>▶ Check the material may mix other hardness substance or gravel |
|                                |  | ● Unsuitable feed rate   | ▶ Reduce the feed rate  |
|                                |  | ● Cutter become dull   | ▶ Regrind the tools   |
|                                | ● Break  | ● Cutting liquid go off  | ▶ Change the cutting liquid   |
|                                |  | ● Work material unsuitable fixed   | ▶ Indeed fix the work material<br>▶ Improve install tool  |
|                                |  | ● Cutter become dull   | ▶ Regrind process   |
|                                |  | ● End mill with uncorrect operation  | ▶ Be careful of keep and operate  |
|                                | ● Chip jam                                     | ▶ Use cutting liquid in large, during dry Milling use air blow to remove chips |   |

## 立銑刀故障分析與對策

end mill expert




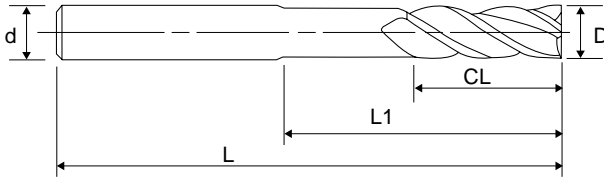
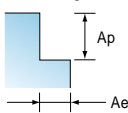
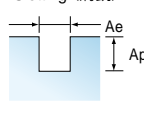
| 項目                | 故障          | 原因           | 對策  |                  |
|-------------------|-------------|--------------|---|------------------|
| ● 加工面精度           | ● 加工面較粗     | ● 振動、顫振      | <ul style="list-style-type: none"> <li>▶ 提高工件安裝剛性</li> <li>▶ 改正機械的不良部位</li> <li>▶ 降低立銑刀的轉速</li> <li>▶ 進行逆銑</li> <li>▶ 將立銑刀的刃長伸出長度控制在最小範圍</li> </ul> |                  |
|                   |             | ● 加工工件的硬度不均一 | ▶ 測量硬度後進行選擇適合的刀具  |                  |
|                   |             | ● 先端形狀不合適    | <ul style="list-style-type: none"> <li>▶ 採用合適的前角、後角</li> <li>▶ 改善磨削面的表面粗糙度</li> </ul>   |                  |
|                   |             | ● 有積屑瘤、熔附物   | <ul style="list-style-type: none"> <li>▶ 除去積屑瘤、熔附物</li> <li>▶ 檢查切削液的變質情況</li> </ul>   |                  |
|                   |             | ● 刃尖鈍化       | ▶ 確定適當的再研磨時期  |                  |
|                   |             | ● 切削速度過快     | ▶ 減慢切削速度  |                  |
|                   |             | ● 切削液不適、不足   | ▶ 改變切削液或供給方法  |                  |
|                   | ● 加工面擠裂     | ● 切削刃的摩擦不均衡  | ▶ 通過再研磨除去摩擦   |                  |
|                   |             | ● 刃部有熔附物     | <ul style="list-style-type: none"> <li>▶ 除去熔附物</li> <li>▶ 更換切削液</li> </ul>  |                  |
|                   |             | ● 切削刃有打痕     | ▶ 注意使用、保管   |                  |
|                   | ● 加工面波紋     | ● 刃數較少       | ▶ 按2刃→4刃→6刃增加刃數   |                  |
|                   |             | ● 切入量、進給量過大  | ▶ 減小切深、進給量  |                  |
|                   |             | ● 螺旋角過大      | ▶ 減小螺旋角   |                  |
|                   | ● 形狀精度      | ● 垂直度        | ● 切入量、進給量過大   | ▶ 減小切深、進給量       |
|                   |             |              | ● 伸出長度過長  | ▶ 使用刃長伸出長度最短的立銑刀 |
| ● 安裝用具的工件支撐面垂直度不夠 |             |              | ▶ 改善支撐面垂直度  |                  |
| ● 立銑刀的壽命          | ● 再研磨後的壽命較短 | ● 工件材料的硬度較高  | <ul style="list-style-type: none"> <li>▶ 熱處理為適合的硬度</li> <li>▶ 工件材料為高硬度時減小進給量或者更換為更高硬度刀具材料</li> </ul>  |                  |
|                   |             | ● 進給量不適      | ▶ 改變為適合的進給量   |                  |
|                   |             | ● 有積屑瘤、熔附物   | <ul style="list-style-type: none"> <li>▶ 除去積屑瘤、熔附物</li> <li>▶ 選擇合適的切削液</li> </ul>   |                  |
|                   |             | ● 切削液不適      | <ul style="list-style-type: none"> <li>▶ 選擇合適的切削液</li> <li>▶ 使用足量的切削液</li> </ul>  |                  |
|                   | ● 切削刃的摩擦過大  | ● 加工工件材料的缺陷  | <ul style="list-style-type: none"> <li>▶ 實現工件材料內部組織的平均化</li> <li>▶ 消除硬度不均</li> </ul>  |                  |
|                   |             | ● 刃尖角度不適合    | ▶ 再研磨為適合的前角、後角  |                  |
|                   |             | ● 立銑刀的切削性能下降 | ▶ 進行表面處理  |                  |
|                   |             | ● 切削液不適      | <ul style="list-style-type: none"> <li>▶ 變更為合適的切削液</li> <li>▶ 變換給油方式</li> </ul>   |                  |
|                   |             | ● 再研磨時期不適    | ▶ 對再研磨時間進行管理  |                  |
|                   | ● 刀刃缺損      | ● 振動、顫振      | ▶ 加強加工工件安裝用具  |                  |
|                   |             | ● 工件材料的缺陷    | <ul style="list-style-type: none"> <li>▶ 實現內部組織的平均化</li> <li>▶ 使用合適的硬度、消除硬度不均</li> <li>▶ 檢查是否有硬質異物、砂等混入材料</li> </ul>                                |                  |
|                   |             | ● 進給量不適      | ▶ 減少進給量   |                  |
|                   |             | ● 切削刃鈍化      | ▶ 實施再研磨   |                  |
|                   |             | ● 切削液劣化      | ▶ 更換切削液   |                  |
|                   | ● 折斷        | ● 工件固定不當     | <ul style="list-style-type: none"> <li>▶ 確實固定加工工件</li> <li>▶ 改善安裝用具</li> </ul>  |                  |
|                   |             | ● 切削刃鈍化      | ▶ 實施再研磨   |                  |
|                   |             | ● 立銑刀使用不當    | ▶ 注意保管、使用   |                  |
|                   |             | ● 切屑堵塞       | ▶ 大量使用切削液、乾式時用高壓空氣吹去切屑  |                  |

- 黑色數字是根據 ASTM E-140 的表一而來 (由 SAE、ASM 和 ASTM 共同校正而來)。
- 括號( )內的數值和單位是由psi換算而來，其原為JIS Z 8413 和 Z 8483換算表。1MPa=1N/mm<sup>2</sup>
- 表中括號( )內的數值比較少用，僅提供參考。




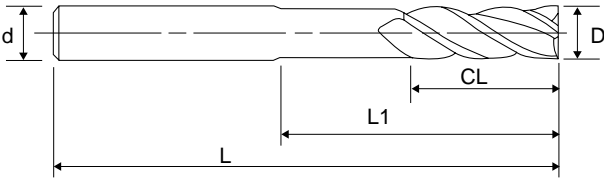
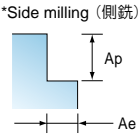
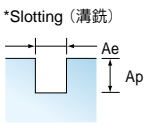
## ■ 硬度換算表 (SAE J 417) 根據洛氏硬度C標度而得之鋼的換算概值表 (1)

| (HRC)<br>洛氏硬度<br>C級硬度 | (HV)<br>維氏硬<br>度 | 布氏硬度(HB)球體<br>直徑10mm 荷重<br>3000kgf |           | 洛氏硬度 (3)                            |                                       |                                      | 洛表面硬度<br>鑽石圓錐壓子      |                      |                      | (Hs)<br>支柱<br>硬度 | 拉伸強度<br>(進位值)<br>MPa<br>(kgf/mm <sup>2</sup> )<br>(2) | 洛氏硬度<br>C級硬度<br>(3) |
|-----------------------|------------------|------------------------------------|-----------|-------------------------------------|---------------------------------------|--------------------------------------|----------------------|----------------------|----------------------|------------------|---|---------------------|
|                       |                  | 標準球                                | 碳化錳壓<br>球 | A標度<br>荷重: 60kgf<br>鑽石圓錐壓子<br>(HRA) | B標度<br>荷重: 100kgf<br>直徑1.6mm<br>(HRB) | D標度<br>荷重: 100kgf<br>鑽石圓錐壓子<br>(HRD) | 15 - N級<br>荷重: 15kgf | 30 - N級<br>荷重: 30kgf | 45 - N級<br>荷重: 45kgf |                  |   |                     |
| 68                    | 940              |                                    |           | 85.6                                |                                       | 76.9                                 | 93.2                 | 84.4                 | 75.4                 | 97               |   | 68                  |
| 67                    | 900              |                                    |           | 85                                  |                                       | 76.1                                 | 92.9                 | 83.6                 | 74.2                 | 95               |   | 67                  |
| 66                    | 865              |                                    |           | 84.5                                |                                       | 75.4                                 | 92.5                 | 82.8                 | 73.3                 | 92               |   | 66                  |
| 65                    | 832              |                                    | (739)     | 83.9                                |                                       | 74.5                                 | 92.2                 | 81.9                 | 72                   | 91               |   | 65                  |
| 64                    | 800              |                                    | (722)     | 83.4                                |                                       | 73.8                                 | 91.8                 | 81.1                 | 71                   | 88               |   | 64                  |
| 63                    | 772              |                                    | (705)     | 82.8                                |                                       | 73                                   | 91.4                 | 80.1                 | 69.9                 | 87               |   | 63                  |
| 62                    | 746              |                                    | (688)     | 82.3                                |                                       | 72.2                                 | 91.1                 | 79.3                 | 68.8                 | 85               |   | 62                  |
| 61                    | 720              |                                    | (670)     | 81.8                                |                                       | 71.5                                 | 90.7                 | 78.4                 | 67.7                 | 83               |   | 61                  |
| 60                    | 697              |                                    | (654)     | 81.2                                |                                       | 70.7                                 | 90.2                 | 77.5                 | 66.6                 | 81               |   | 60                  |
| 59                    | 674              |                                    | (634)     | 80.7                                |                                       | 69.9                                 | 89.8                 | 76.6                 | 65.5                 | 80               |   | 59                  |
| 58                    | 653              |                                    | 615       | 80.1                                |                                       | 69.2                                 | 89.3                 | 75.7                 | 64.3                 | 78               |   | 58                  |
| 57                    | 633              |                                    | 595       | 79.6                                |                                       | 68.5                                 | 88.9                 | 74.8                 | 63.2                 | 76               |   | 57                  |
| 56                    | 613              |                                    | 577       | 79                                  |                                       | 67.7                                 | 88.3                 | 73.9                 | 62                   | 75               |   | 56                  |
| 55                    | 595              |                                    | 560       | 78.5                                |                                       | 66.9                                 | 87.9                 | 73                   | 60.9                 | 74               | 2075 (212)  | 55                  |
| 54                    | 577              |                                    | 543       | 78                                  |                                       | 66.1                                 | 87.4                 | 72                   | 59.8                 | 72               | 2015 (205)  | 54                  |
| 53                    | 560              |                                    | 525       | 77.4                                |                                       | 65.4                                 | 86.9                 | 71.2                 | 58.5                 | 71               | 1950 (199)  | 53                  |
| 52                    | 544              | (500)                              | 512       | 76.8                                |                                       | 64.6                                 | 86.4                 | 70.2                 | 57.4                 | 69               | 1880 (192)  | 52                  |
| 51                    | 528              | (487)                              | 496       | 76.3                                |                                       | 63.8                                 | 85.9                 | 69.4                 | 56.1                 | 68               | 1820 (186)  | 51                  |
| 50                    | 513              | (475)                              | 481       | 75.9                                |                                       | 63.1                                 | 85.5                 | 68.5                 | 55                   | 67               | 1760 (179)  | 50                  |
| 49                    | 498              | (464)                              | 469       | 75.2                                |                                       | 62.1                                 | 85                   | 67.6                 | 53.8                 | 66               | 1695 (173)  | 49                  |
| 48                    | 484              | 451                                | 455       | 74.7                                |                                       | 61.4                                 | 84.5                 | 66.7                 | 52.5                 | 64               | 1635 (167)  | 48                  |
| 47                    | 471              | 442                                | 443       | 74.1                                |                                       | 60.8                                 | 83.9                 | 65.8                 | 51.4                 | 63               | 1580 (161)  | 47                  |
| 46                    | 458              | 432                                | 432       | 73.6                                |                                       | 60                                   | 83.5                 | 64.8                 | 50.3                 | 62               | 1530 (156)  | 46                  |
| 45                    | 446              | 421                                | 421       | 73.1                                |                                       | 59.2                                 | 83                   | 64                   | 49                   | 60               | 1480 (151)  | 45                  |
| 44                    | 434              | 409                                | 409       | 72.5                                |                                       | 58.5                                 | 82.5                 | 63.1                 | 47.8                 | 58               | 1435 (146)  | 44                  |
| 43                    | 423              | 400                                | 400       | 72                                  |                                       | 57.7                                 | 82                   | 62.2                 | 46.7                 | 57               | 1385 (141)  | 43                  |
| 42                    | 412              | 390                                | 390       | 71.5                                |                                       | 56.9                                 | 81.5                 | 61.3                 | 45.5                 | 56               | 1340 (136)  | 42                  |
| 41                    | 402              | 381                                | 381       | 70.9                                |                                       | 56.2                                 | 80.9                 | 60.4                 | 44.3                 | 55               | 1295 (132)  | 41                  |
| 40                    | 392              | 371                                | 371       | 70.4                                |                                       | 55.4                                 | 80.4                 | 59.5                 | 43.1                 | 54               | 1250 (127)  | 40                  |
| 39                    | 382              | 362                                | 362       | 69.9                                |                                       | 54.6                                 | 79.9                 | 58.6                 | 41.9                 | 52               | 1215 (124)  | 39                  |
| 38                    | 372              | 353                                | 353       | 69.4                                |                                       | 53.8                                 | 79.4                 | 57.7                 | 40.8                 | 51               | 1180 (120)  | 38                  |
| 37                    | 363              | 344                                | 344       | 68.9                                |                                       | 53.1                                 | 78.8                 | 56.8                 | 39.6                 | 50               | 1160 (118)  | 37                  |
| 36                    | 354              | 336                                | 336       | 68.4                                | (109)                                 | 52.3                                 | 78.3                 | 55.9                 | 38.4                 | 49               | 1115 (114)  | 36                  |
| 35                    | 345              | 327                                | 327       | 67.9                                | (108.5)                               | 51.5                                 | 77.7                 | 55                   | 37.2                 | 48               | 1080 (110)  | 35                  |
| 34                    | 336              | 319                                | 319       | 67.4                                | (108)                                 | 50.8                                 | 77.2                 | 54.2                 | 36.1                 | 47               | 1055 (108)  | 34                  |
| 33                    | 327              | 311                                | 311       | 66.8                                | (107.5)                               | 50                                   | 76.6                 | 53.3                 | 34.9                 | 46               | 1025 (105)  | 33                  |
| 32                    | 318              | 301                                | 301       | 66.3                                | (107)                                 | 49.2                                 | 76.1                 | 52.1                 | 33.7                 | 44               | 1000 (102)  | 32                  |
| 31                    | 310              | 294                                | 294       | 65.8                                | (106)                                 | 48.4                                 | 75.6                 | 51.3                 | 32.7                 | 43               | 980 (100)   | 31                  |
| 30                    | 302              | 286                                | 286       | 65.3                                | (105.5)                               | 47.7                                 | 75                   | 50.4                 | 31.3                 | 42               | 950 (97)  | 30                  |
| 29                    | 294              | 279                                | 279       | 64.7                                | (104.5)                               | 47                                   | 74.5                 | 49.5                 | 30.1                 | 41               | 930 (95)  | 29                  |
| 28                    | 286              | 271                                | 271       | 64.3                                | (104)                                 | 46.1                                 | 73.9                 | 48.6                 | 28.9                 | 41               | 910 (93)  | 28                  |
| 27                    | 279              | 264                                | 264       | 63.8                                | (103)                                 | 45.2                                 | 73.3                 | 47.7                 | 27.8                 | 40               | 880 (90)  | 27                  |
| 26                    | 272              | 258                                | 258       | 63.3                                | (102.5)                               | 44.6                                 | 72.8                 | 46.8                 | 26.7                 | 38               | 860 (88)  | 26                  |
| 25                    | 266              | 253                                | 253       | 62.8                                | (101.5)                               | 43.8                                 | 72.2                 | 45.9                 | 25.5                 | 38               | 840 (86)  | 25                  |
| 24                    | 260              | 247                                | 247       | 62.4                                | (101)                                 | 43.1                                 | 71.6                 | 45                   | 24.3                 | 37               | 825 (84)  | 24                  |
| 23                    | 254              | 243                                | 243       | 62                                  | 100                                   | 42.1                                 | 71                   | 44                   | 23.1                 | 36               | 805 (82)  | 23                  |
| 22                    | 248              | 237                                | 237       | 61.5                                | 99                                    | 41.6                                 | 70.5                 | 43.2                 | 22                   | 35               | 785 (80)  | 22                  |
| 21                    | 243              | 231                                | 231       | 61                                  | 98.5                                  | 40.9                                 | 69.9                 | 42.3                 | 20.7                 | 35               | 770 (79)  | 21                  |
| 20                    | 238              | 226                                | 226       | 60.5                                | 97.8                                  | 40.1                                 | 69.4                 | 41.5                 | 19.6                 | 34               | 760 (77)  | 20                  |
| (18)                  | 230              | 219                                | 219       |                                     | 96.7                                  |                                      |                      |                      |                      | 33               | 730 (75)  | (18)                |
| (16)                  | 222              | 212                                | 212       |                                     | 95.5                                  |                                      |                      |                      |                      | 32               | 705 (72)  | (16)                |
| (14)                  | 213              | 203                                | 203       |                                     | 93.9                                  |                                      |                      |                      |                      | 31               | 675 (69)  | (14)                |
| (12)                  | 204              | 194                                | 194       |                                     | 92.3                                  |                                      |                      |                      |                      | 29               | 650 (66)  | (12)                |
| (10)                  | 196              | 187                                | 187       |                                     | 90.7                                  |                                      |                      |                      |                      | 28               | 620 (63)  | (10)                |
| (8)                   | 188              | 179                                | 179       |                                     | 89.5                                  |                                      |                      |                      |                      | 27               | 600 (61)  | (8)                 |
| (6)                   | 180              | 171                                | 171       |                                     | 87.1                                  |                                      |                      |                      |                      | 26               | 580 (59)  | (6)                 |
| (4)                   | 173              | 165                                | 165       |                                     | 85.5                                  |                                      |                      |                      |                      | 25               | 550 (56)  | (4)                 |
| (2)                   | 166              | 158                                | 158       |                                     | 83.5                                  |                                      |                      |                      |                      | 24               | 530 (54)  | (2)                 |
| (0)                   | 160              | 152                                | 152       |                                     | 81.7                                  |                                      |                      |                      |                      | 24               | 515 (53)  | (0)                 |

**Custom Tool Design Inquiry Form**

|                      |   |   |   |          |
|----------------------|---|---|---|----------|
| Work piece Material  |   |   |   |          |
| Hardness             | <input type="checkbox"/> HRC_____ <input type="checkbox"/> HB_____ <input type="checkbox"/> Other_____  |   |   |          |
| Type of Coating      | <input type="checkbox"/> ST standard(refer to our catalogue) <input type="checkbox"/> Uncoated<br><input type="checkbox"/> Customers Requirement _____  |   |   |          |
| Type of Flute Spiral | <input type="checkbox"/> Right <input type="checkbox"/> Left  |   |   |          |
| No of Flutes         | <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> Other_____ |   |   |          |
| Type of End Cut      |  <input type="checkbox"/> Square   |  <input type="checkbox"/> Corner Radius<br>r=_____   |  <input type="checkbox"/> Ball R=_____         |          |
| Type of Shank        | <input type="checkbox"/> No Side Lock <input type="checkbox"/> Side Lock  |   |   |          |
| Specification        |   |   |   |          |
|                      | D_____ CL_____ L1_____ L_____ d_____  |   |   |          |
| Application          | <input type="checkbox"/> Side Milling   | Common Side Milling   | <input type="checkbox"/> Side milling (側銑)<br> | Ap:_____ |
|                      |   | Cavity  |   | Ae:_____ |
|                      | <input type="checkbox"/> Slotting   |   | <input type="checkbox"/> Slotting (溝銑)<br>     | Ap:_____ |
|                      | <input type="checkbox"/> Drilling & Milling   |   |   | Ae:_____ |
|                      | Machine Processing  | <input type="checkbox"/> Finishing <input type="checkbox"/> Roughing <input type="checkbox"/> General Purpose<br><input type="checkbox"/> Other_____  |   |          |
|                      | Coolant Type  | <input type="checkbox"/> Soluble <input type="checkbox"/> Oil Coolant <input type="checkbox"/> Oil Mist<br><input type="checkbox"/> Dry Cutting <input type="checkbox"/> Air Cooling <input type="checkbox"/> Other_____              |   |          |
|                      | Tool Life Standard  | <input type="checkbox"/> Cutting Time <input type="checkbox"/> Load of Machine <input type="checkbox"/> Finish<br><input type="checkbox"/> Tool Wear <input type="checkbox"/> Vibration and Sound <input type="checkbox"/> Other_____ |   |          |
|                      | Desired Life  |   |   |          |
| Finish Requirement   | <input type="checkbox"/> Required Roughness_____ <input type="checkbox"/> Not Required  |   |   |          |
| Other                | Special Requirement   |   |   |          |

訂製刀具需求表

|          |  |  |   |          |  |
|----------|--|--|---|----------|--|
| 工件材質     |  |  |   |          |  |
| 硬 度      | <input type="checkbox"/> HRC_____ <input type="checkbox"/> HB_____ <input type="checkbox"/> 其他_____  |  |   |          |  |
| 塗 層      | <input type="checkbox"/> 我司標準塗層(詳見目錄) <input type="checkbox"/> 客戶指定塗層_____ <input type="checkbox"/> 不需塗層   |  |   |          |  |
| 螺旋類型     | <input type="checkbox"/> 右旋 <input type="checkbox"/> 左旋  |  |   |          |  |
| 刃 數      | <input type="checkbox"/> 1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/> 6 <input type="checkbox"/> 其他_____ |  |   |          |  |
| 底刃形狀     |  <input type="checkbox"/> 平刀  |  <input type="checkbox"/> 圓鼻刀圓弧角r=_____ |  <input type="checkbox"/> 球刀 半徑R=_____   |          |  |
| 柄部形狀     | <input type="checkbox"/> 無側固 <input type="checkbox"/> 需側固  |  |   |          |  |
| 各部尺寸     |    |  |   |          |  |
|          | D_____ CL_____ L1_____ L_____ d_____   |  |   |          |  |
| 加工形式     | <input type="checkbox"/> 側銑  | 普通側銑   |  <p>*Side milling (側銑)</p>   | Ap:_____ |  |
|          |  | 腔銑   |   | Ae:_____ |  |
|          | <input type="checkbox"/> 槽銑  |  |  <p>*Slotting (溝銑)</p>   | Ap:_____ |  |
|          | <input type="checkbox"/> 鑽銑  |  |   | Ae:_____ |  |
|          | 加工種類   |  | <input type="checkbox"/> 精加工 <input type="checkbox"/> 粗加工 <input type="checkbox"/> 通用加工 <input type="checkbox"/> 其他_____  |          |  |
|          | 冷卻方式   |  | <input type="checkbox"/> 水冷 <input type="checkbox"/> 油冷 <input type="checkbox"/> 油霧<br><input type="checkbox"/> 乾式 <input type="checkbox"/> 風冷 <input type="checkbox"/> 其他_____           |          |  |
|          | 刀具壽命判定依據   |  | <input type="checkbox"/> 切削時間 <input type="checkbox"/> 機床負載 <input type="checkbox"/> 光潔度<br><input type="checkbox"/> 刀具磨損 <input type="checkbox"/> 震動、聲音 <input type="checkbox"/> 其他_____ |          |  |
|          | 刀具壽命要求   |  |   |          |  |
| 工件表面質量要求 |  | <input type="checkbox"/> 有要求 具體粗糙度值_____ <input type="checkbox"/> 無要求  |   |          |  |
| 其他要求     | (刀具材質、加工圖、特殊使用狀況)  |  |   |          |  |



Speedtiger\_global



YouTube SpeedTigerTaiwan



SPEED TIGER Global



@SPEEDTIGER\_1998



Taiwan FanPage  
台灣粉絲專頁  
SPEED TIGER



Taiwan Group  
台灣社團  
Speedtiger好康報報





SPEED TIGER PRECISION TECHNOLOGY Co., Ltd.  
震虎精密科技股份有限公司  
No.10, Jingke 2nd Rd., Nantun Dist., Taichung  
City 408, Taiwan  
台中市南屯區精科二路10號  
TEL:+886-4-2350-3022 FAX:+886-4-2350-3083

