SPEED TIGER

2025-2026

SPEED TIGER

Infinity Power Precision Technology

www.speedtiger.com.tw







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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 ± 2 μm
奈米級公差標示±2μm

Speed Tiger cutting tool's tolerance indication entered the nanometer level precision; the world highest precision size±2μm in faith value enables the user to grasp the cutting tool's news thoroughly, understood how to request the cutting tool quality

2μm 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

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		400 PLUS Series - Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計	78
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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 鉸刀
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 步驟 1 Select your cutting application 選擇加工材質

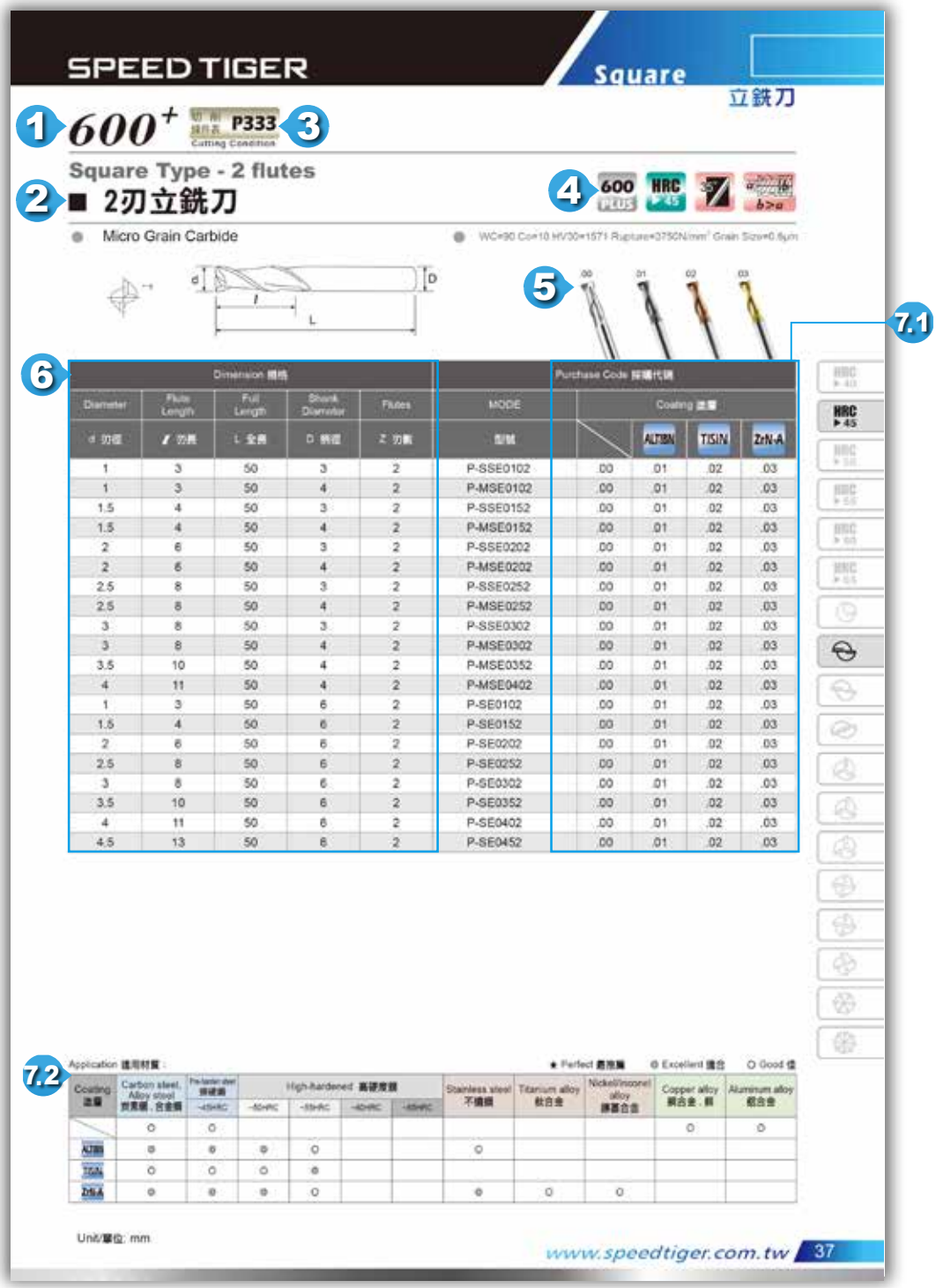
Step 步驟 2 Choose tools type 選擇需求刀具類型

Step 步驟 3 Find the page 隨即得到對應的頁碼

Work Piece 被切削材
★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	炭素鋼 / 合金鋼 Carbon steel / Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum alloy	Spec. 規格表	Cutting Condition 切削條件
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																		
Square 平刀	Miniature Square Type 微小徑立銑刀	P-MIE	2			○	○								○	○		
					ALTiBN	◎	◎	◎	○			○						
					TiSiN	○	○	○	◎									
					ZrN-A	◎	◎	◎	○			◎	○	○				

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+ P333 3

Square Type - 2 flutes

2 ■ 2刃立銑刀

4 600 PLUS HRC 45

Micro Grain Carbide

5

7.1

6

Dimension 規格						Purchase Code 採購代碼				
Diameter d 刃徑	Flute Length ℓ 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes Z 刃數	MODE 型號	Coating 塗層				
							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	

7.2

Application 適用材質：

★ Perfect ◎ Excellent ○ Good

Coating 塗層	Carbon steel, Alloy steel 普通鋼、合金鋼	Pre-hardened steel 預硬鋼	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
	○	○								○	○
ALTiN	◎	◎	◎	○			○				
TiSiN	○	○	○	◎							
ZrN-A	◎	◎	◎	○			◎	○	○		

Unit/單位: mm

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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 鎢鋼材質

- 600 Nano — Tungsten Carbide 600 Nano 鎢鋼600奈米
- 400 Nano — Tungsten Carbide 400 Nano 鎢鋼400奈米
- 200 Nano — Tungsten Carbide 200 Nano 鎢鋼200奈米
- 600 PLUS — Tungsten Carbide 600 PLUS 鎢鋼600奈米PLUS
- 400 PLUS — Tungsten Carbide 400 PLUS 鎢鋼400奈米PLUS
- 200 PLUS — Tungsten Carbide 200 PLUS 鎢鋼200奈米PLUS

Coating 塗層

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

- ZrN-A — ZrN-A Coating ZrN-A 鍍層
- ZrN-S — ZrN-S Coating ZrN-S 鍍層
- ALTIBN — ALTIBN Coating ALTIBN 鍍層
- P-nACo — P-nACo Coating P-nACo 鍍層
- TiSiN+ — TiSiN+ Coating TiSiN+ 鍍層
- SH+ZrN — SH+ZrN Coating SH+ZrN 鍍層
- nACo — nACo Coating nACo 鍍層
- nACRo — nACRo Coating nACRo 鍍層
- TB — TB Coating TB 鍍層
- RS — RS Coating RS 鍍層
- TiSiN — TiSiN Coating TiSiN 鍍層
- TiCN — TiCN Coating TiCN 鍍層
- SH — SH Coating SH 鍍層
- nBS — nBS Coating nBS 鍍層
- SS — SS Coating SS 鍍層
- SSA — SSA Coating SSA 鍍層

Helix Angle 螺旋角度


Helix Angle θ 切削刃角度 θ



Unequal leads 不等導程


Unequal Helix Angle 不等螺旋


Unequal Helix Angle 不等螺旋

ADDITIONAL GEOMETRY 幾何設計



Taper Core 不等心厚



Unequal Flute Spacing 不等分割



Unequal Flute Spacing 不等分割



Unequal Flute Spacing 不等分割



Corner Radius 圓鼻角度



Rake Angle 切削前角


Special Groove Geometry 特殊溝底


Edge Conditioning 刀口鈍化


Protective Chamfer 刀口倒角


Free Space 特殊外徑角



Sharp-edged 端角尖角



Protective Chamfer of 45° 端角倒角


Partially Polished Edge 端角保護角


Special Chip Breaker 特殊溝型


Front Chamfer 拋光


Double Rake Angle 雙前角



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

Tools Specification 加工硬度

- HRC 40 — Working Hardness 40° 加工硬度 40°
- HRC 45 — Working Hardness 45° 加工硬度 45°
- HRC 50 — Working Hardness 50° 加工硬度 50°
- HRC 55 — Working Hardness 55° 加工硬度 55°
- HRC 60 — Working Hardness 60° 加工硬度 60°
- HRC 65 — Working Hardness 65° 加工硬度 65°

Products Index
產品索引

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

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																			
Square 平刀	Square Type 立銑刀	P-MPE P-PE (45°)	4			○	○								○	○		43	334
					ALTiBN	◎	◎	◎	○			○						43	334
					TiSiN	○	○	○	◎									43	334
					ZrN-A	◎	◎	◎	○			◎	○	○				43	334
	Long Shank Square Type 長柄立銑刀	P-SLE P-MLE	2			○	○								○	○		45	332
					ALTiBN	◎	◎	○	○			○						45	332
					TiSiN	○	○	○	○									45	332
					ZrN-A	◎	◎	○	○			◎	○	○				45	332
			4			○	○								○	○		46	336-337
					ALTiBN	◎	◎	○	○			○						46	336-337
					TiSiN	○	○	○	○									46	336-337
					ZrN-A	◎	◎	○	○			◎	○	○				46	336-337
	Long Flute Square Type 長刃立銑刀	P-LET	2			○	○								○	○		47	338
					ALTiBN	◎	◎	○	○			○						47	338
					TiSiN	○	○	○	○									47	338
					ZrN-A	◎	◎	○	○			◎	○	○				47	338

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																			
Square 平刀	Long Flute Square Type 長刃立銑刀	P-LET	4			○	○								○	○		48	339
					ALTiBN	◎	◎	○	○			○						48	339
					TiSiN	○	○	○	○									48	339
					ZrN-A	◎	◎	○	○			◎	○	○				48	339
	Long Neck Square Type 深溝長頸立銑刀	P-LNT	2			○	○								○	○		49	340-341
					ALTiBN	◎	◎	○	○			○						49	340-341
					TiSiN	○	○	○	○									49	340-341
					ZrN-A	◎	◎	○	○			◎	○	○				49	340-341
	Fine Pitch & Roughing Type 粗精銑立銑刀	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 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																		
Square 平刀	Roughing Type 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 Type 斜度立銑刀	P-TTA	2		ALTiBN	○	◎	○	○			○					56	346
					TiSiN	○	◎	◎	○								56	346
					ZrN-A	○	◎	○	○			○	○				56	346
	Taper Long Flute Square Type 長刃斜度立銑刀	P-LTTA	2		ALTiBN	○	◎	○	○			○					60	346
					TiSiN	○	◎	◎	○								60	346
					ZrN-A	○	◎	○	○			○	○				60	346

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum alloy		
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																			
Ball Nose 球刀	Miniature Ball Nose Type 微小徑球型立銑刀	P-MIB	2			○	○								○	○	62	347-348
					ALTIBN	◎	◎	◎	○			○					62	347-348
					TiSiN	○	○	○	◎								62	347-348
					ZrN-A	◎	◎	◎	○			◎	○	○			62	347-348
	Ball Nose Type 球型立銑刀	P-SSB P-MSB P-SB	2			○	○								○	○	63	349
					ALTIBN	◎	◎	◎	○			○					63	349
					TiSiN	○	○	○	◎								63	349
					ZrN-A	◎	◎	◎	○			◎	○	○			63	349
			4			○	○								○	○	64	350
					ALTIBN	◎	◎	◎	○			○					64	350
					TiSiN	○	○	○	◎								64	350
					ZrN-A	◎	◎	◎	○			◎	○	○			64	350
	Long Shank Ball Nose Type 長柄球型立銑刀	P-SLB P-MLB P-LLB P-XLB	2			○	○								○	○	65	347-348
					ALTIBN	◎	◎	○	○			○					65	347-348
					TiSiN	○	○	○	○								65	347-348
					ZrN-A	◎	◎	○	○			◎	○	○			65	347-348

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
600 PLUS Series - Taper Core Design for General Application 高效系列 - 不等心厚刀型設計																		
Ball Nose 球刀	Long Neck Ball Nose Type 深溝長頸球型立銑刀	P-LNBT	2			○	○								○	○	66	351
					ALTiBN	◎	◎	○	○			○					66	351
					TiSiN	○	○	○	○								66	351
					ZrN-A	◎	◎	○	○			◎	○	○			66	351
	Pencil Neck Ball Nose Type 斜頸球型立銑刀	P-PBTA	2		ALTiBN	◎	◎	○	○			○					68	352
					TiSiN	○	○	○	○								68	352
					ZrN-A	◎	◎	○	○			◎	○	○			68	352
	Taper Ball Nose Type 斜度球型立銑刀	P-TBTA	2		ALTiBN	◎	◎	○	○			○					69	352
					TiSiN	○	○	○	○								69	352
					ZrN-A	◎	◎	○	○			◎	○	○			69	352
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	P-RTA	2			○	○								○	○	71	353
					ALTiBN	◎	◎	◎	○			○					71	353
					TiSiN	○	○	○	◎								71	353
					ZrN-A	◎	◎	◎	○			◎	○	○			71	353

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

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳 炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy	Spec. 規格表	Cutting Condition 切削條件
400 PLUS Series - Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計																		
Square 平刀	Square Type 立銑刀	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 Square Type 長刃立銑刀	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 Square Type 多刃立銑刀	P-UVT	5		ALTiBN	◎	◎	◎	◎	○		○					88	360
			7		nACRo	◎	◎	◎	○	○			○				88	360
			9		ZrN-S	◎	◎	◎	◎	○		◎	○	○			88	360
	Multiple Flutes Long Flute Square Type 多刃長刃立銑刀	P-ULVT	5		ALTiBN	◎	◎	◎	◎	○		○					89	360
			7		nACRo	◎	◎	◎	○	○			○				89	360
			9		ZrN-S	◎	◎	◎	◎	○		◎	○	○			89	360

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

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

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
400 PLUS Series - Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計																			
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	P-URTA	4		ALTiBN	◎	◎	◎	◎	○		○						104	370
					nACRo	◎	◎	◎	○	○			○					104	370
					ZrN-S	◎	◎	◎	◎	○		◎	○	○				104	370
	Pencil Neck Corner Radius Type 斜頸圓鼻立銑刀	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 Radius Nose Type 長頸圓鼻立銑刀	P-UCR	4		ALTiBN	◎	◎	◎	◎	○		○						109	373
					nACRo	◎	◎	◎	○	○			○					109	373
					ZrN-S	◎	◎	◎	◎	○		◎	○	○				109	373
Square 平刀	Square Type 不等立銑刀	PVE	4		ALTiBN	◎	◎	◎	◎	○		○						110	374-379
					nACRo	◎	◎	◎	○	○			○					110	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○		110	374-379
	Square Type Short Flute 1倍刃長不等立銑刀	PVES	4		ALTiBN	◎	◎	◎	◎	○		○						111	374-379
					nACRo	◎	◎	◎	○	○			○					111	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○		111	374-379

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳 炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy	Spec. 規格表	Cutting Condition 切削條件
400 PLUS Series - Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計																		
Square 平刀	Square Type Medium Flute 1.5倍刃長不等立銑刀	PVEM	4		ALTiBN	◎	◎	◎	◎	○		○					111	374-379
					nACRo	◎	◎	◎	○	○			○				111	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○	111	374-379
	Square Type Long Flute 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 Heavy Duty 不等立銑刀 高速重切	PVEC	4		ALTiBN	◎	◎	◎	◎	○		○					112	374-379
					nACRo	◎	◎	◎	○	○			○				112	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○	112	374-379
Ball Nose 球刀	Ball Nose Type 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 Long Flute & Neck 不等球型立銑刀 長刃 & 有效	PVBSX	4		ALTiBN	◎	◎	◎	◎	○		○					113	374-379
					nACRo	◎	◎	◎	○	○			○				113	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○	113	374-379
Corner Radius 圓鼻刀	Corner Radius Type 不等圓鼻立銑刀	PVR	4		ALTiBN	◎	◎	◎	◎	○		○					114	374-379
					nACRo	◎	◎	◎	○	○			○				114	374-379
					ZrN-S	◎	◎	◎	◎	○		◎	◎	★	○	○	114	374-379

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum 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																			
Square 平刀	Miniature Square Type 微小徑立銑刀	P-SFUMIE	2		TiSiN+	○	○	○	◎	◎	◎							118	380
					P-nACo	○	○	○	◎	◎	★							118	380
	Square Type 立銑刀	P-SFUET	2		TiSiN+	○	○	○	◎	◎	◎							120	381
					P-nACo	○	○	○	◎	◎	★							120	381
			4		TiSiN+	○	○	○	◎	◎	◎							121	381
					P-nACo	○	○	○	◎	◎	★							121	381
	Long Flute Square Type 長刃立銑刀	P-SFULET	2		TiSiN+	○	○	○	◎	◎	◎							122	383
					P-nACo	○	○	○	◎	◎	★							122	383
			4		TiSiN+	○	○	○	◎	◎	◎							123	384
					P-nACo	○	○	○	◎	◎	★							123	384
	Multiple Flutes Square Type 多刃立銑刀	P-SFUVT	6		TiSiN+	○	○	○	◎	◎	◎							124	385
			8		P-nACo	○	○	○	◎	◎	★							124	385
	Multiple Flutes Long Flute Square Type 長刃立銑刀	P-SFULVT	6		TiSiN+	○	○	○	◎	◎	◎							125	385
			8		P-nACo	○	○	○	◎	◎	★							125	385
	Long Neck Square Type 深溝長頸立銑刀	P-SFULNT	2		TiSiN+	○	○	○	◎	◎	◎							126	361, 386
			4		P-nACo	○	○	○	◎	◎	★							126	361, 386
Ball Nose 球刀	Miniature Ball Nose Type 微小徑球型立銑刀	P-SFUMIB	2		TiSiN+	○	○	○	◎	◎	◎							128	387
					P-nACo	○	○	○	◎	◎	★							128	387

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳 碳素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy	Spec. 規格表	Cutting Condition 切削條件
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 球刀	Ball Nose Type 球型立銑刀	P-SFUBT	2		TiSiN+	○	○	○	◎	◎	◎						130	388
					P-nACo	○	○	○	◎	◎	★						130	388
	Ball Nose Type 球型立銑刀	P-SFUBT	4		TiSiN+	○	○	○	◎	◎	◎						131	388
					P-nACo	○	○	○	◎	◎	★						131	388
	Power Short Flute Ball Nose Type 強力短刃球型立銑刀	P-SFUBTSX	2		TiSiN+	○	○	○	◎	◎	◎						132	389
					P-nACo	○	○	○	◎	◎	★						132	389
	Long Shank Ball Nose Type 長柄球型立銑刀	P-SFULBT	2		TiSiN+	○	○	○	◎	◎	◎						133	389
					P-nACo	○	○	○	◎	◎	★						133	389
	Long Neck Ball Nose Type 深溝長頸球型立銑刀	P-SFULNBT	2		TiSiN+	○	○	○	◎	◎	◎						134	366-367
					P-nACo	○	○	○	◎	◎	★						134	366-367
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	P-SFURTA	4		TiSiN+	○	○	○	◎	◎	◎						136	390
					P-nACo	○	○	○	◎	◎	★						136	390
	Long Neck & Shank Corner Radius Type 長頸長柄圓鼻立銑刀	P-SFUCRM	2		TiSiN+	○	○	○	◎	◎	◎						137	391
					P-nACo	○	○	○	◎	◎	★						137	391
			4		TiSiN+	○	○	○	◎	◎	◎						138	392
					P-nACo	○	○	○	◎	◎	★						138	392

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum 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 圓鼻刀	Pencil Neck Corner Radius Type 斜頸圓鼻立銑刀	P-SFUCRS	2		TiSiN+	○	○	○	◎	◎	◎							139	393
					P-nACo	○	○	○	◎	◎	★							139	393
			4		TiSiN+	○	○	○	◎	◎	◎							141	394
					P-nACo	○	○	○	◎	◎	★							141	394
	Long Neck Corner Radius Type 深溝長頸圓鼻立銑刀	P-SFUCR	2		TiSiN+	○	○	○	◎	◎	◎							143	395
					P-nACo	○	○	○	◎	◎	★							143	395
Ball Nose 球刀	3 Different Flutes Ball Nose Type 3刃不等分割球型立銑刀	DAB	3		TiSiN+	○	○	○	◎	◎	◎							150	396
					P-nACo	○	○	○	◎	◎	★							150	396
Corner Radius 圓鼻刀	3 Different Flutes Corner Radius Type 3刃不等分割圓鼻立銑刀	DAC			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 平刀	Square Type-For Wood & Plastic 塑膠、木工用立銑刀	AP	1															154	398
					TB													155	398
	Square Type For Copper & Aluminum 銅鋁合金立銑刀	AE5	2												○	◎		156	399
		AEL5													○	◎		156	400-401
		AE5			TB										○	◎		157	399
		AEL5													○	◎		157	400-401
		AE5	3												○	◎		158	402
		AEL5													○	◎		158	403

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

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum alloy		
Non-Ferrous Series 非鐵用系列 High Speed Series for Aluminum 高速鋁用刀																		
Square 平刀	High Feed U-Type Aluminum 超高速鋁用立銑刀	AUE	3												◎	★	174	408
	High Feed U-Type Aluminum 超高速長刃鋁用立銑刀	AUEL	3												◎	★	174	409
Ball Nose 球刀	High Feed Ball Nose Aluminum 鋁用高速球型立銑刀	AUB	2		TB										◎	★	175	410
Corner Radius 圓鼻刀	High Feed Corner Radius Aluminum 超高速鋁用圓鼻刀	AUR	3												◎	★	176	408
Non-Ferrous Series 非鐵用系列 AeroSpace High Speed Series for Aluminum 航太用 - 高速鋁用刀																		
Square 平刀	High Feed U-Type Aluminum For Slotting 超高速鋁用開槽立銑刀	S-AUE	3		TB										◎	★	178	408
	High Speed Square Type For Aluminum 超高速鋁用刀	AAS	3		TB										○	◎	179	411
		AA	3		TB										○	◎	179	411
Square 平刀	Long Neck Square Type 深溝長頸鋁用立銑刀	AAL	3		TB										○	◎	180	412
Corner Radius 圓鼻刀	Corner Radius Type 鋁用圓鼻立銑刀	CMF	2		TB										○	◎	181	413
		CA-AA	3		TB										○	◎	182	414
		CR-AA	3		TB										○	◎	183	415-416

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材	Application 應用範圍	Spec. 規格表	Cutting Condition 切削條件
Titanium Nickel / Inconel Alloy 鈦利嗨系列									
Square 平刀	Square Type For Exotic Materials 難切削材專用立銑刀	PVE1T PLVE1T	4		ZrN-A	Titanium 鈦合金	Roughing Finishing	188	417
		PNVE1T	4		ZrN-A	Titanium 鈦合金	Roughing Finishing	189	418

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材	Application 應用範圍	Spec. 規格表	Cutting Condition 切削條件
Titanium Nickel / Inconel Alloy 鈦利嗨系列									
Square 平刀	Square Type For Exotic Materials 難切削材專用精銑刀	PVE1TF	4		ZrN-A	Titanium 鈦合金	Roughing Finishing	190	418
Corner Radius 圓鼻刀	Corner Radius Type For Exotic Materials 難切削材專用圓鼻立銑刀	PVR1T	4		ZrN-A	Titanium 鈦合金	Roughing Finishing	191	418

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
Functional Series 功能性系列 RS Series - Anti-wear 超潤滑系列																		
Square 平刀	Miniature Square Type 微小徑立銑刀	SUMIE	2		RS	◎	◎	○	○			◎			○	○	194	332
	Square Type 立銑刀	SUPE	2		RS	◎	◎	◎	○			◎			○	○	195	332
			3		RS	◎	◎	○	○			◎			○	○	196	419
			4		RS	◎	◎	◎	○			◎			○	○	198	336-337
	Long Flute Square Type 長刃立銑刀	SULPE (45°)	4		RS	◎	◎	◎	○			◎			○	○	199	420
		SULET (35°)	2		RS	◎	◎	◎	○			◎			○	○	200	358
			4		RS	◎	◎	◎	○			◎			○	○	201	359
	Long Neck Square Type 深溝長頸立銑刀	SULNT	2		RS	◎	◎	◎	○			◎			○	○	202	406

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳												Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 鋼 Copper alloy	鋁合金 Aluminum alloy		
Functional Series 功能性系列 RS Series - Anti-wear 超潤滑系列																			
Square 平刀	Fine Pitch Roughing Type 粗精立銑刀	SUNTA	3		RS	◎	◎	○		○		◎			○	○		204	342
			4		RS	◎	◎	○	○			◎			○	○		205	343
	Roughing Type 粗銑刀	SUXTA	3		RS	◎	◎	○		○		◎			○	○		206	344
			4		RS	◎	◎	○	○			◎			○	○		207	345
Ball Nose 球刀	Miniature Ball Nose Type 微小徑球型立銑刀	SUMIB	2		RS	◎	◎	◎	○			◎			○	○		208	347-348
	Ball Nose Type 球型立銑刀	SUBT	2		RS	◎	◎	◎	○			◎			○	○		209	347-348
			4		RS	◎	◎	◎	○			◎			○	○		210	421
	Long Shank Ball Nose Type 長柄球型立銑刀	SULBT	2		RS	◎	◎	◎	○			◎			○	○		211	347-348
	Long Neck Ball Nose Type 深溝長頸球型立銑刀	SULNBT	2		RS	◎	◎	◎	○			◎			○	○		212	407
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	SURTA	3		RS	◎	◎	◎	○			◎			○	○		214	422
Functional Series 功能性系列 FHP Series - Heavy Duty 強力高速重切削銑刀系列																			
Square 平刀	Short Flute Square Type 短刃立銑刀	FHPS	4		ALTiBN	◎	◎	◎	○	○								218	423-424
	Square Type 立銑刀	FHP			ALTiBN	◎	◎	◎	○	○								221	423-424
	Long Flute Square Type 長刃立銑刀	FHPM			ALTiBN	◎	◎	◎	○	○								222	423-424
		FHPL			ALTiBN	◎	◎	◎	○	○								222	423-424
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	CRFHP	4		ALTiBN	◎	◎	◎	○	○								223	423-424

End Shape 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
Functional Series 功能性系列 FHP+ Series - Heavy Duty Plus高速重切削粗精銑刀系列																		
Square 平刀	Square Type 立銑刀	FHPC	4		nACRo	◎	◎	◎	○	○		○			○		226	425
	Long Flute Square Type 長刃立銑刀	FHPMC	4		nACRo	◎	◎	◎	○	○		○			○		226	425
		FHPLC	4		nACRo	◎	◎	◎	○	○		○			○		226	425
Corner Radius 圓鼻刀	Corner Radius Type 圓鼻立銑刀	CRFHPC	4		nACRo	◎	◎	◎	○	○		○			○		227	425
Functional Series 功能性系列 HPSS Series - High Speed Plugging + Slotting + Side milling 插溝側三合一重切削銑刀系列																		
Square 平刀	Square Type 立銑刀	HPSS	3		SS	◎	◎	○									231	426
Functional Series 功能性系列 KK Series - Multi Flutes High Efficiency 多刃高效立銑刀																		
Square 平刀	Roughing & Finishing Type 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 刃端形狀	Type 刀型	Mode 型號	Flute 刃數	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳													Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
Functional Series 功能性系列 SH Series - Super High Hardness & Super High Speed Cutting 超高硬度 & 超高速加工系列																				
Ball Nose 球刀	Ball Nose Type 超高硬度/超高速球刀	KTG	2		SH	○	○	◎	◎	◎	★						240	431
Corner Radius 圓鼻刀	Corner Radius Type 超高硬度/超高速圓鼻刀	KCR	4		SH	○	○	◎	◎	◎	★						241	432
Functional Series 功能性系列 Big Foot Series - Double Removal Rate 高移除率球刀系列																				
Ball Nose 球刀	Ball Nose Type 高移除率球刀	BFR	2		SH	○	○	◎	◎	◎	★						245	433
Functional Series 功能性系列 SUS Series - Stainless Steel Expert 不鏽鋼專用系列																				
Square 平刀	Square Type 不鏽鋼專用立銑刀	SUS	4		SSA	○	○					◎					247	336-337
	Long Flute Square Type 不鏽鋼專用長刃立銑刀	SUSL			SSA	○	○					◎					247	359
Functional Series 功能性系列 Multi-function Series CDM多功能銑刀																				
Multi-function 多功能	Multi-function Type 多功能立銑刀	CDM	2		ALTiBN	○	◎	◎	○			○					248	434
Frictional - Carbide End Mills 英制- 鎢鋼立銑刀																				
General Series 泛用系列 600 Nano Series 600 奈米系列																				
Square 平刀	Square Type 立銑刀	ISE	2		ALTiBN	◎	◎	◎	○			○					250	435-440
			4		ALTiBN	◎	◎	◎	○			○					251	
Ball Nose 球刀	Ball Nose Type 球型立銑刀	ISB	2		ALTiBN	◎	◎	◎	○			○					252	
Non-Ferrous Series 非鐵用系列 High Speed Series for Non-Ferrous 超高速鋁用刀																				
Square 平刀	Square Type 2刃鋁合金專用立銑刀	IAE5	2		ZrN										○	◎	253	441
	High Feed U-Type Aluminum 超高速鋁用立銑刀	IAUE	3												◎	★	254	441
400 PLUS Series 400 PLUS 系列 Unequal Flute Spacing & Helix Design 抗震系列 - 不等分割、不等螺旋刀型設計																				
Square 平刀	Square Type 立銑刀	IPVE	4		ALTiBN	◎	◎	◎	◎								255	442-447
400 PLUS Series 400 PLUS 系列 400 PLUS Series - 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 圓鼻刀	Corner Radius Type 圓鼻立銑刀	IPVR1T	4		ALTiBN	◎	◎	◎	◎			○	◎	○			256	448

High Efficient Cutting System燒結系統

3.5KW Induction Machine and Water Cooling Station 3.5KW電磁感應加熱水冷機組	Dual End Carbide Anti-Vibration Shrink Fit Extension & Adapter 雙頭龍鎢鋼抗震延長桿 & 雙頭龍轉接座	Fixture of Heating 燒結加熱治具
ST-3500 P.259	P.265 & 266	P.267
		

Replaceable End Mills Head 可替換刀頭立銑刀

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 功能性銑刀頭

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 刀片&刀片刀桿				
INDEXABLE RADIUS INSERT RD 可轉位式圓鼻銑刀片		RD ACCESSORIES RD配件		
RDEW RDEX E級 精度±0.025 研磨級	For Aluminum RDHX (鋁用) E級 精度±0.025 研磨級	RD Shrink Fit Head RD捨棄式燒結刀頭	Radius End Mill Holder RD捨棄式整體刀柄	Radius End Mill Holder RD捨棄式整體刀柄
P.288	P.288	P.289	P.290	P.291
 Cutting Condition 切削條件 463	 TB Coating	 Patent Indexable Shrink Fit Head TW Nr. M512454 Cn Nr. 201520721653.9 專利捨棄式刀頭		

BALL NOSE INSERT WR 捨棄式球刀片		WR ACCESSORIES WR配件	
WRHS H級 精度±0.013 研磨級		WR Shrink Fit Head WR捨棄式燒結刀頭	Ball-Nose End Mill Holder WR捨棄式整體刀柄
P.295		P.296	P.297
 Cutting Condition 切削條件 464		 Patent Indexable Shrink Fit Head TW Nr. M512454 Cn Nr. 201520721653.9 專利捨棄式刀頭	

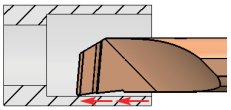
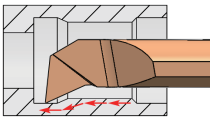
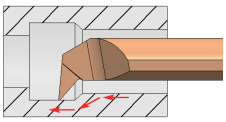
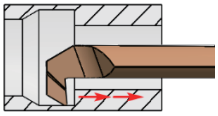
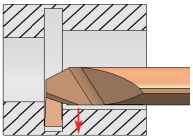
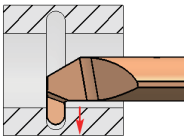
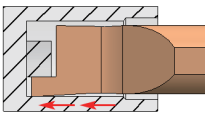
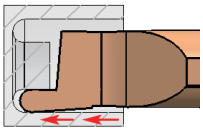
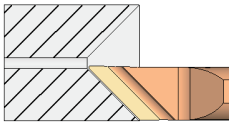
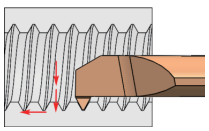
INDEXABLE HN INSERT HN 可轉位式雙面六角銑刀片	HN ACCESSORIES HN 配件	
HNGX	HN06 Holder HN06 捨棄式整體刀柄	HN09 Holder HN09 捨棄式整體刀柄
P.302	P.303	P.304
 Cutting Condition 切削條件 465		

INDEXABLE CN INSERT CN 可轉位式雙面銑刀片	CN ACCESSORIES CN 配件	
CNGX	CNGX07 Shrink Fit Head CNGX07 捨棄式燒結刀頭	CNGX07 Holder CNGX07 捨棄式整體刀柄
P.308	P.309	P.309
 Cutting Condition 切削條件 466	 Patent Indexable Shrink Fit Head TW Nr. M512454 Cn Nr. 201520721653.9 專利捨棄式刀頭	

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
	 TB Coating	 Patent Indexable Shrink Fit Head TW Nr. M512454 Cn Nr. 201520721653.9 專利捨棄式刀頭

End Shape 刃端形狀	Flute 刃數	Type 刀型	Mode 型號	Shape 圖樣	Coating 塗層	Work Piece 被切削材 ◎Excellent 最適用 ○Good 適 用											Spec. 規格表	Cutting Condition 切削條件
						炭素鋼 / 合金鋼 Carbon steel, Alloy steel	預硬鋼 45 HRC 以下 Pre-harden steel under 45HRC	高硬度 50 HRC以下 High-hardened steel under 50HRC	高硬度 55 HRC以下 High-hardened steel under 55HRC	高硬度 60 HRC以下 High-hardened steel under 60HRC	高硬度 65 HRC以下 High-hardened steel under 65HRC	不銹鋼 Stainless steel	鈦合金 Titanium alloy	鎳基合金 Nickel/Inconel alloy	銅合金 / 銅 Copper alloy	鋁合金 Aluminum alloy		
Spot Drill / Chamfer Mill + Insert Set 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**																		
45°		SE12 Spot Drill/ Chamfer Mill 定點鑽/倒角刀	SE12		SH+ZrN	◎	○								○	○	313	313
30°		SE12 Spot Drill/ Chamfer Mill 定點鑽/倒角刀	SE12		SH+ZrN	◎	○								○	○	313	313
Position Drill 定位鑽 **PDST series 定位鑽**																		
Multi-function 多功能	2	Position Drill 定位鑽	PDST			○	◎	○							○	○	314	467
			PDST		ZrN-A	○	◎	◎	○			○	○	○	○	○	315	
		Long Shank Position Drill 長柄定位鑽	PDST			○	◎	○							○	○	316	467
			PDST		ZrN-A	○	◎	◎	○			○	○	○	○	○	317	
Reamer 鉸刀 **RE & REC Series- Reamer & Carbide Edge Reamer** **鎢鋼鉸刀 / 刃部鎢鋼頭鉸刀**																		
Reamer 鉸刀	6	Carbide Reamer 鉸刀	RE			○	○	○	○	○	○	○			○	○	318	468
		Carbide Edge Reamer 刃部鎢鋼	REC			○	○	○	○	○	○	○			○	○	319	

MINI SYSTEM Ultra-small turning tool
小徑車削工具

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

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.

2 抑制顫振及噪音的效果更加明顯

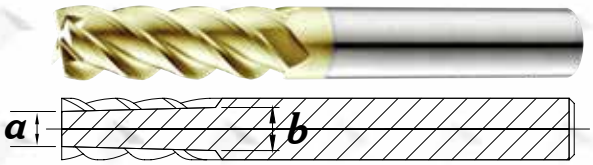
Excellent performance of anti-vibration and noise.

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.

video 切削影片

此刀型設計
可提升加工效率
This shape makes more efficient



$b > a$

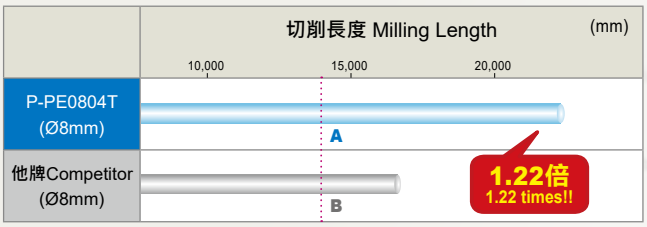
Taper Core 錐型心厚



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



A

P-PE0804T：加工140M的損耗照片
P-PE0804T：Picture of wear after milling 140m



B

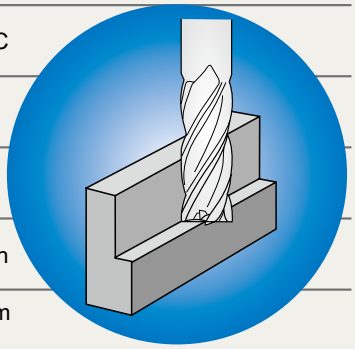
他牌：加工140M的損耗照片
Competitor：Picture of wear after milling 140m



Unit/單位: mm

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



P-PE0804T：加工表面良好
Favorable Machined Surface



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



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

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

Unit/單位: mm

600+

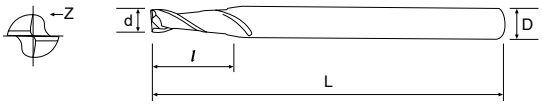
切削條件表 P332
Cutting Condition

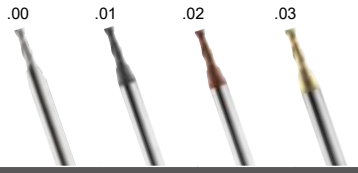
Miniature Square Type - 2 flutes

■ 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/mm² 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
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

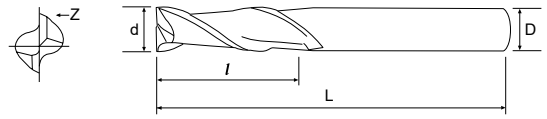
600+

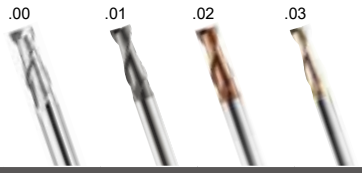
切削條件表 P333
Cutting Condition

Square Type - 2 flutes
■ 2刃立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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

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	◎	◎	◎	○			◎	○	○		

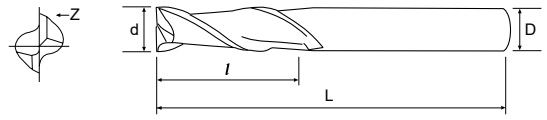
Unit/單位: mm

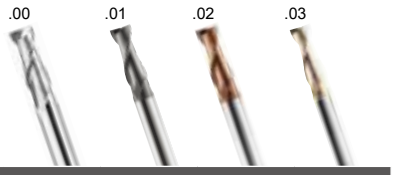
600+ 切削條件表 P333 Cutting Condition

Square Type - 2 flutes
■ 2刃立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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+

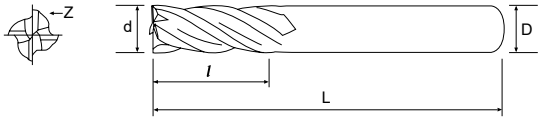
切削條件表 P334
Cutting Condition

Square Type - 4 flutes

■ 4刃立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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

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

600+

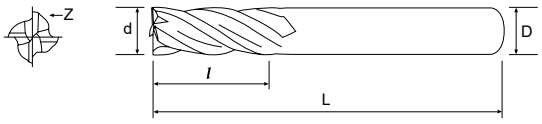
切削條件表 P334
Cutting Condition

Square Type - 4 flutes

■ 4刃立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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

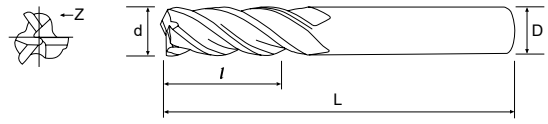
600+

切削條件表 P335
Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

■ 3刃45° 立銑刀

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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

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

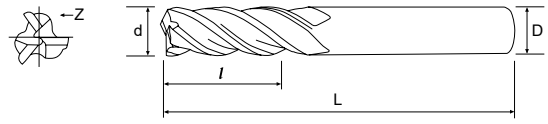
600+ 切削條件表 P335 Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

■ 3刃45° 立銑刀

600 PLUS | HRC ▶ 45 | 45° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	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

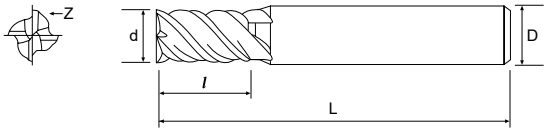
600+ 切削條件表 P334 Cutting Condition

Square Type - Helix Angle 45° - 4 flutes

■ 4刃45° 立銑刀

600 PLUS | HRC ▶45 | 45° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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+

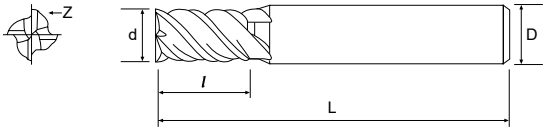
切削條件表 P334
Cutting Condition

Square Type - Helix Angle 45° - 4 flutes

■ 4刃45° 立銑刀

600 PLUS | HRC ▶ 45 | 45° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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+

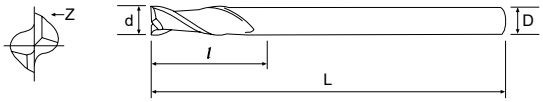
切削條件表 P332
Cutting Condition

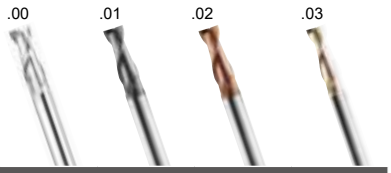
Square Type - Long Shank - 2 flutes

■ 2刃長柄立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

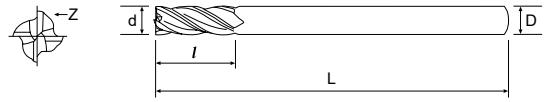
切削條件表 P336-337
Cutting Condition

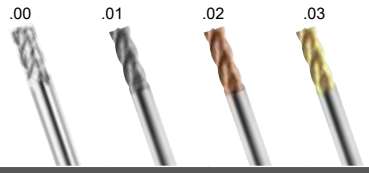
Square Type - Long Shank - 4 flutes

■ 4刃長柄立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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+

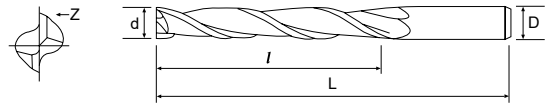
切削條件表 P338
Cutting Condition

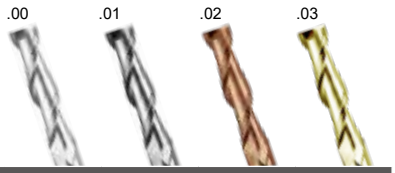
Square Type - Long Flute - 2 flutes

■ 2刃長刃立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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

600+

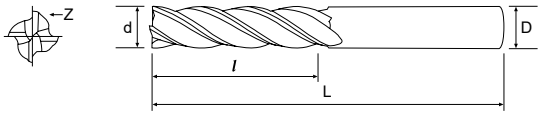
切削條件表 P339
Cutting Condition

Square Type - Long Flute - 4 flutes

■ 4刃長刃立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	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+

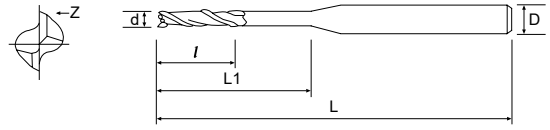
切削條件表 P340-341
Cutting Condition

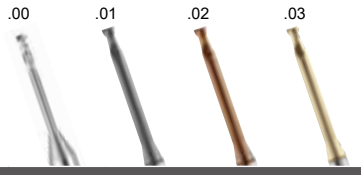
Square Type - Long Neck - 2 flutes

■ 2刃深溝長頸立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

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

600+

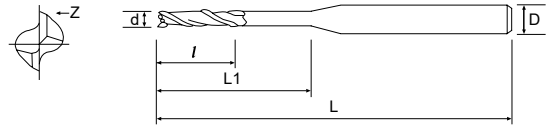
切削條件表 P340-341 Cutting Condition

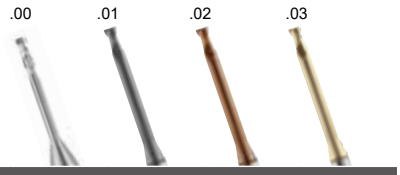
Square Type - Long Neck - 2 flutes

■ 2刃深溝長頸立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

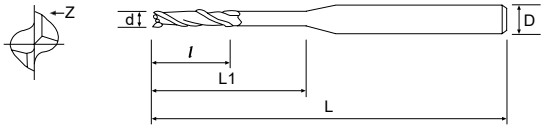
切削條件表 P340-341 Cutting Condition

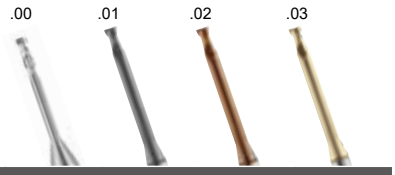
Square Type - Long Neck - 2 flutes

■ 2刃深溝長頸立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

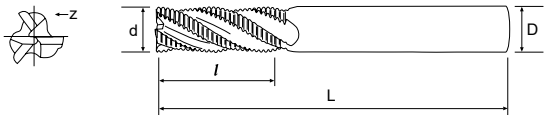
切削條件表 P342
Cutting Condition

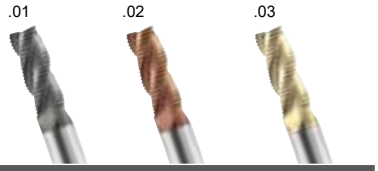
Fine Pitch & Roughing Type - 3 flutes

■ 3刃粗精銑立銑刀

600 PLUS | HRC ▶45 | 40° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

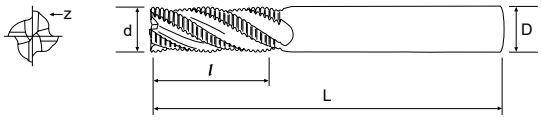
600+ 切削條件表 P343 Cutting Condition

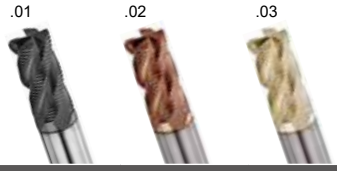
Fine Pitch & Roughing Type - 4 flutes

■ 4刃粗精銑立銑刀

600 PLUS | HRC ▶45 | 40° | a<b, b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

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+

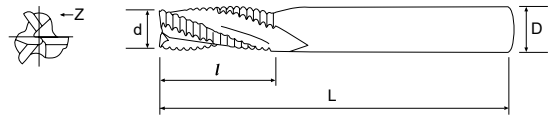
切削條件表 P344
Cutting Condition

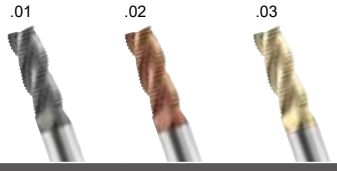
Roughing Type - 3 flutes

■ 3刃粗銑立銑刀

600 PLUS | HRC ▶45 | 25° | a<b, b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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+

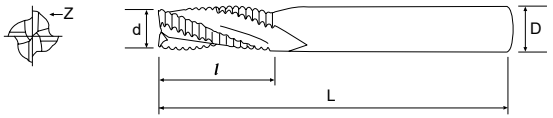
切削條件表 P345
Cutting Condition

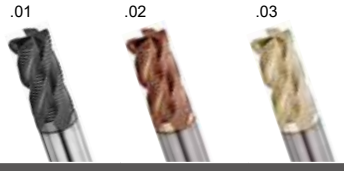
Roughing Type - 4 flutes

■ 4粗銑立銑刀

600 PLUS | HRC ▶45 | 25° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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

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

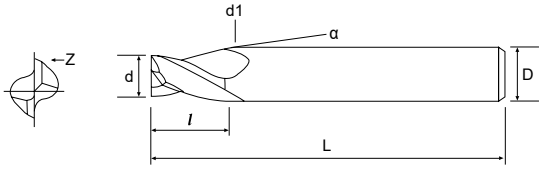
600+ 切削條件表 P346 Cutting Condition

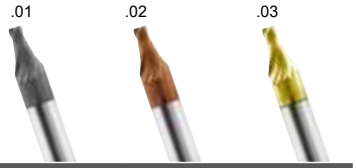
Taper Square Type - 2 flutes

■ 2刃斜度立銑刀

600 PLUS | HRC ▶55 | 35° | a<b, b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

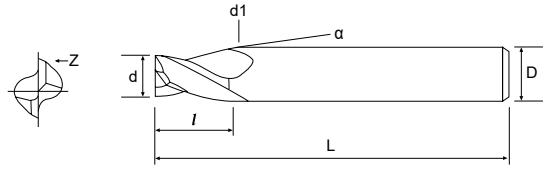
600+ 切削條件表 P346 Cutting Condition

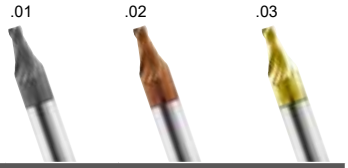
Taper Square Type - 2 flutes

■ 2刃斜度立銑刀

600 PLUS | HRC ▶ 55 | 35° | a<b, b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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	○	◎	○	○			○	○			

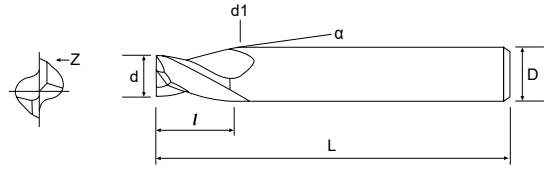
Unit/單位: mm

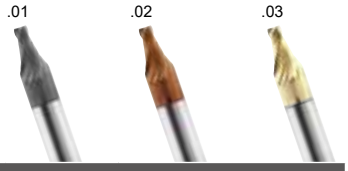
600+ 切削條件表 P346 Cutting Condition

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

600 PLUS | HRC ▶55 | 35° | a<b, b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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	○	◎	○	○			○	○			

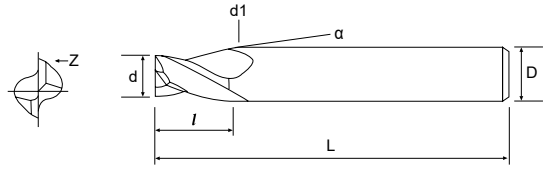
Unit/單位: mm

600+ 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 b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

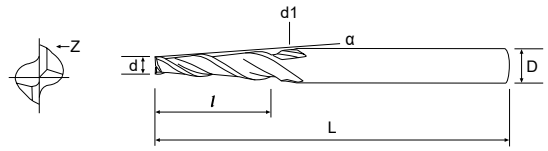
600+ 切削條件表 P346 Cutting Condition

Taper Type - Long flute - 2 flutes

■ 2刃長刃斜度立銑刀

600 PLUS | HRC ▶55 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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

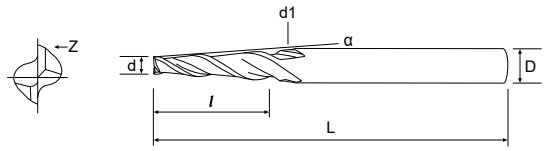
600+ 切削條件表 P346 Cutting Condition

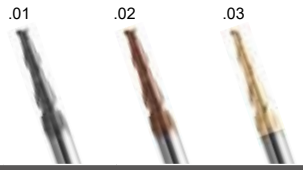
Taper Type - Long flute - 2 flutes

■ 2刃長刃斜度立銑刀

600 PLUS | HRC ▶ 55 | 35° | a<b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

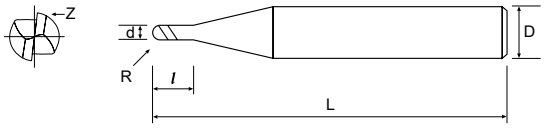
切削條件表 P347-348
Cutting Condition

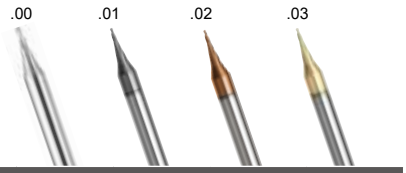
Miniature Ball Nose Type - 2 flutes

■ 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/mm² 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
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-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

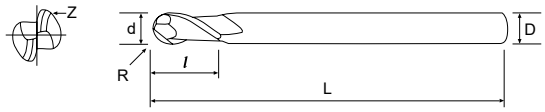
600+ 切削條件表 P349
Cutting Condition

Ball Nose Type - 2 flutes

■ 2刃球型立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	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 ±0.003 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

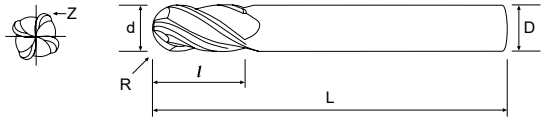
600+

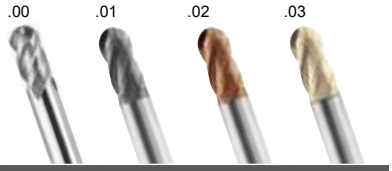
切削條件表 P350
Cutting Condition

Ball Nose Type - 4 flutes
■ 4刃球型立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	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 ±0.003 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

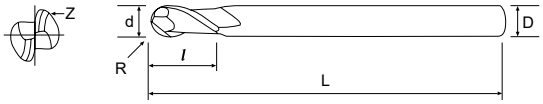
600+ 切削條件表 P347-348
Cutting Condition

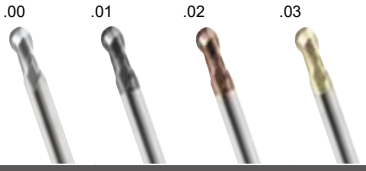
Ball Nose Type - Long Shank - 2 flutes

■ 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/mm² 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+

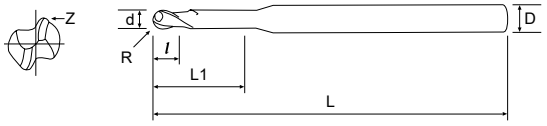
切削條件表 P351
Cutting Condition

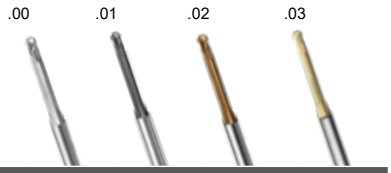
Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

600 PLUS | HRC ▶45 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	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	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

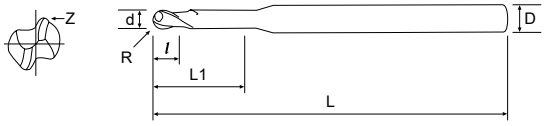
600+ 切削條件表 P351 Cutting Condition

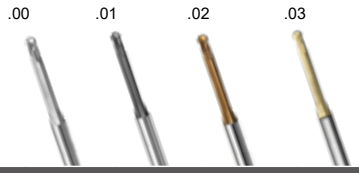
Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	l 刃長	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

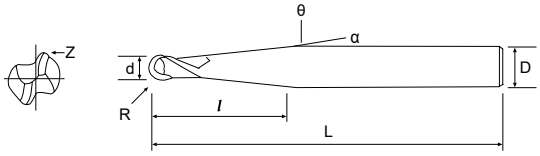
600+ 切削條件表 P352 Cutting Condition

Pencil Neck Ball Nose Type - 2 flutes

■ 2刃斜頸球型銑刀

600 PLUS | HRC ▶55 | 35° | a b b>a

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	l 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

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

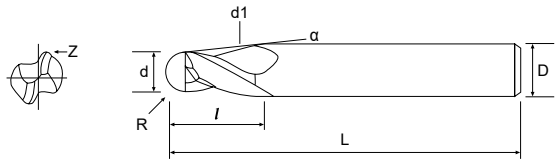
600+ 切削條件表 P352 Cutting Condition

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/mm² Grain Size=0.6μm





Dimension 規格								Purchase Code 採購代碼			
Diameter	Radius	Flute Length	Full Length	Shank Diameter	d1	α	Flutes	MODE	Coating 塗層		
d 刃徑	R 值	l 刃長	L 全長	D 柄徑	大 徑		Z 刃數	型號	ALTiBN	TiSiN	ZrN-A
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-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

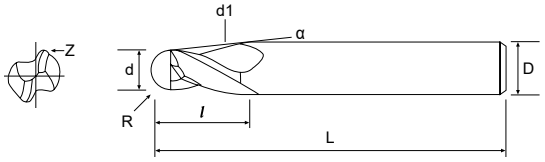
600+ 切削條件表 P352 Cutting Condition

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/mm² Grain Size=0.6μm





Dimension 規格								Purchase Code 採購代碼			
Diameter	Radius	Flute Length	Full Length	Shank Diameter	d1	α	Flutes	MODE	Coating 塗層		
d 刃徑	R 值	l 刃長	L 全長	D 柄徑	大 徑		Z 刃數	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-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

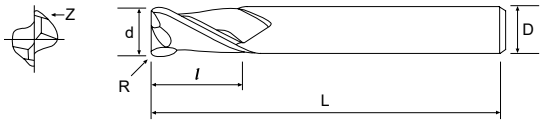
600+ 切削條件表 P353 Cutting Condition

Corner Radius Type - 2 flutes

■ 2刃圓鼻立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

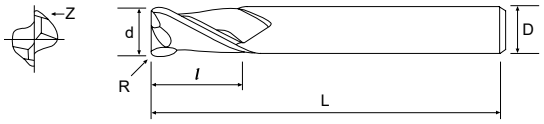
切削條件表 P353
Cutting Condition

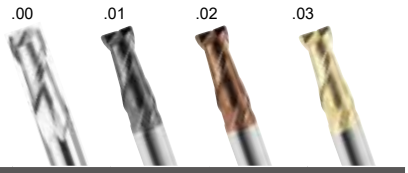
Corner Radius Type - 2 flutes

■ 2刃圓鼻立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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+

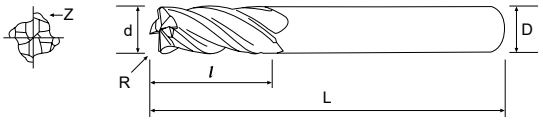
切削條件表 P354
Cutting Condition

Corner Radius Type - 4 flutes

■ 4刃圓鼻立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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+

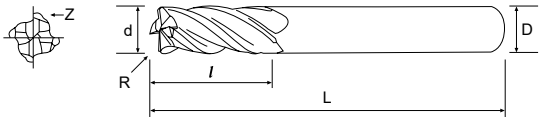
切削條件表 P354
Cutting Condition

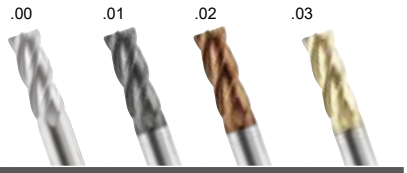
Corner Radius Type - 4 flutes

■ 4刃圓鼻立銑刀

600 PLUS | HRC ▶45 | 35° | a/b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

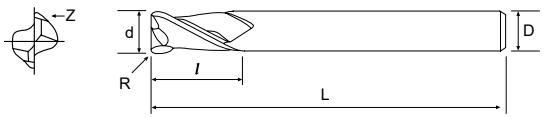
600+ 切削條件表 P353 Cutting Condition

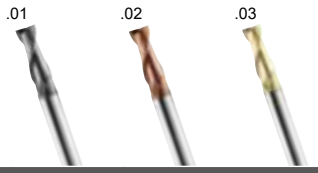
Corner Radius Type - Long Shank - 2 flutes

■ 2刃長柄圓鼻立銑刀

600 PLUS | HRC ▶ 55 | 35° | a<b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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-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

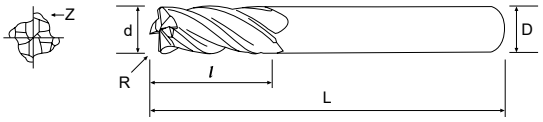
600+ 切削條件表 P354 Cutting Condition

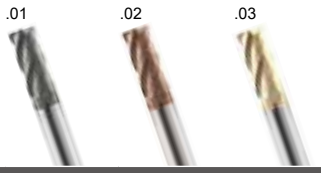
Corner Radius Type - Long Shank - 4 flutes

■ 4刃長柄圓鼻立銑刀

600 PLUS | HRC ▶ 55 | 35° | a<b b>a | R

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	l 刃長	L 全長	D 柄徑	Z 刃數	型號	ALTiBN	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					
ALTiBN	◎	◎	○	○			○				
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



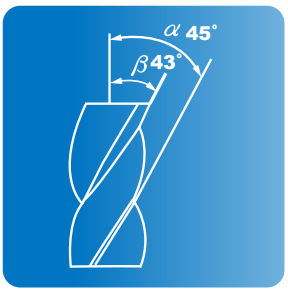
Unequal Flute Spacing & Helix
不等分割 & 不等螺旋

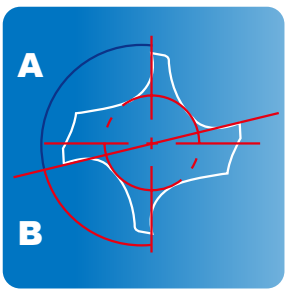
- Excellent vibration absorption provides stability.
- 降低刀具加工時產生的震動頻率
- Less chatter and high efficiency finishing.
- 減少工件側壁的切削震紋
- Reduce metal burr when machining.
- 減少刀具加工產生的端口毛刺

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≠B Irregular Helix Flutes, α≠β Ensures stable machining of difficult-to-cut materials, and achieve high efficient performance.
刀刃分割角採用 A ≠ B 刀刃螺旋角採用 α ≠ β 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

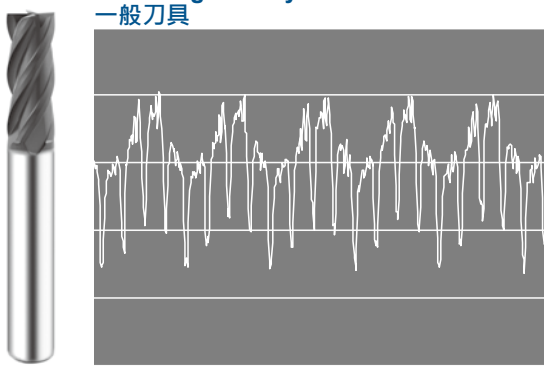
Unit/單位: mm

Cutting Performance 實測比較

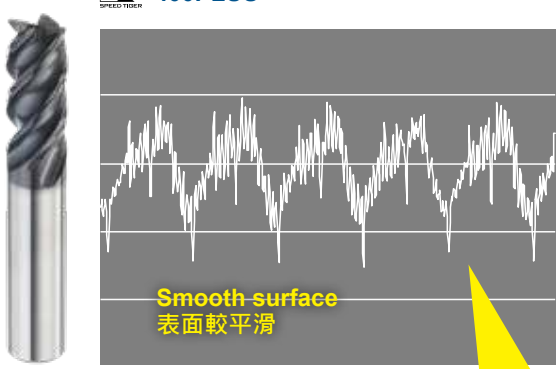
Cutting Analysis 切削比較

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。

General geometry end mill
一般刀具



400PLUS



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)



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。

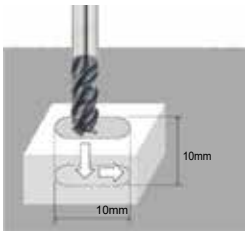


Unit/單位: mm

Cutting Performance 實測比較

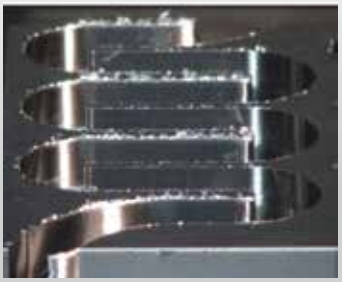
Unequal V.S Unequal - Surface and Tool Life Comparison
他牌抗震刀具 V.S 震虎抗震刀具 - 表面及壽命比較

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
	ae: 10mm
Feed of teeth (Fz) 每刃進給量	0.062
Machine 使用機台	Vertical Machining Center 立式綜合加工機

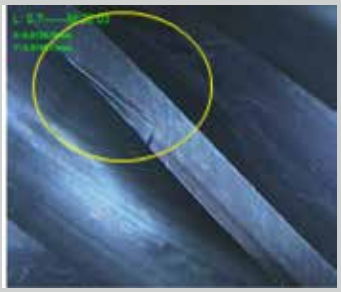


400PLUS video 切削影片

Competitor A 他牌 A

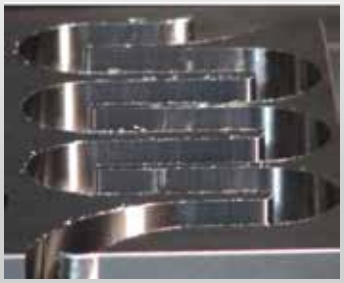


Metal Burr: Heavy 毛刺 : 較厚
Surface: Fine 切壁 : 尚可



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

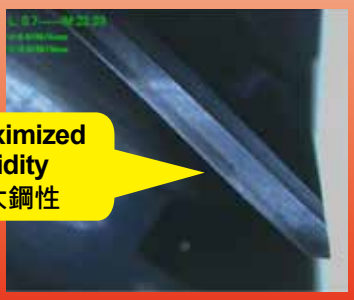


The cutting edge got chipping.
刃部缺角

PVE1004 (ø10mm)



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



The cutting edge is fine!
刃部良好

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

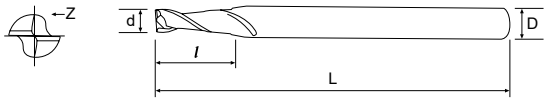


Unit/單位: mm

400+ 切削條件表 P355
Cutting Condition

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

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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-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

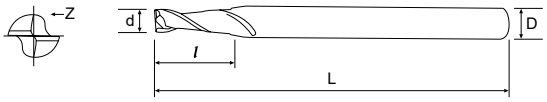
400+

切削條件表 P355
Cutting Condition

Miniature Square Type - 2 flutes

■ 2刃微小徑立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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-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

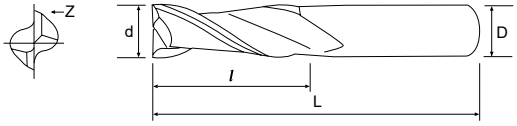
400+

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^2 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-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

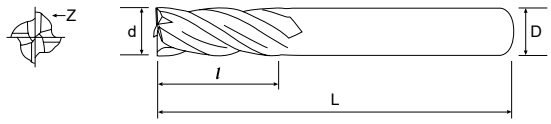
400+

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/mm² 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-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

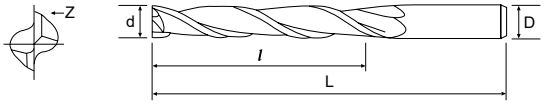
400+

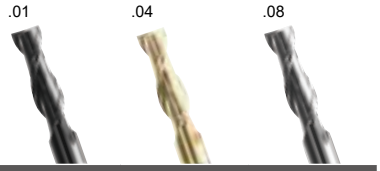
切削條件表 P358
Cutting Condition

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/mm² 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-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

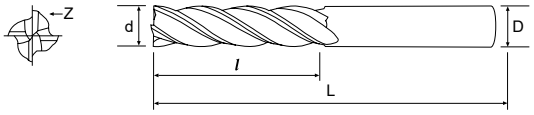
400+

切削條件表 P359
Cutting Condition

Square Type - Long Flute - 4 flutes

■ 4刃長刃立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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

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+

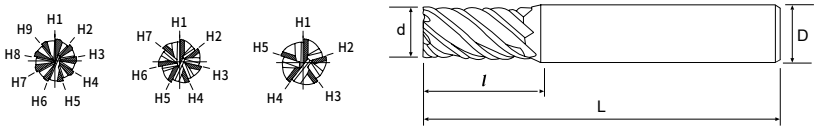
切削條件表 P360
Cutting Condition

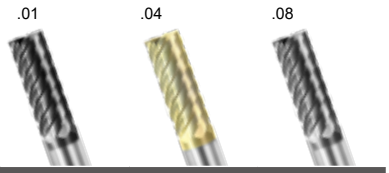
Square Type - For Hard Material - Multiple Flutes

■ 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/mm² 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	16	50	6	5	P-UVT0605	.01	.04	.08
8	20	60	8	7	P-UVT0807	.01	.04	.08
10	30	75	10	7	P-UVT1007	.01	.04	.08
12	32	75	12	7	P-UVT1207	.01	.04	.08
16	40	100	16	9	P-UVT1609	.01	.04	.08
20	45	100	20	9	P-UVT2009	.01	.04	.08
25	45	100	25	9	P-UVT2509	.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+

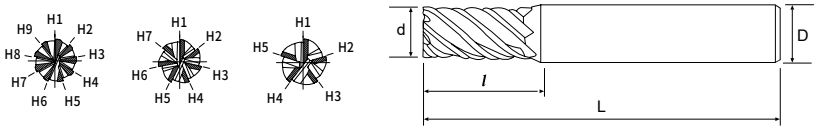
切削條件表 P360
Cutting Condition

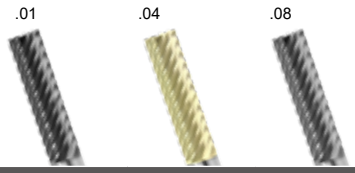
Square Type - Long Flute - Multiple Flutes

■ 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/mm² 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	5	P-ULVT0605	.01	.04	.08
8	30	75	8	7	P-ULVT0807	.01	.04	.08
10	40	100	10	7	P-ULVT1007	.01	.04	.08
12	45	100	12	7	P-ULVT1207	.01	.04	.08
16	65	150	16	9	P-ULVT1609	.01	.04	.08
20	75	150	20	9	P-ULVT2009	.01	.04	.08
25	80	150	25	9	P-ULVT2509	.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

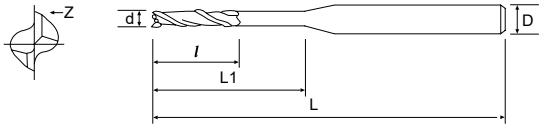
400+ 2刃 切削條件表 P361 Cutting Condition 3刃 切削條件表 P362 Cutting Condition

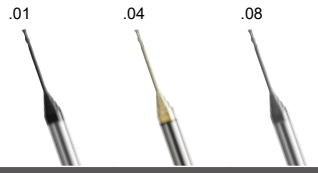
Square Type - Long Neck - 2 & 3 flutes

■ 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/mm² 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	ℓ 刃長	L1 有效長	L 全長	D 柄徑	Z 刃數	型號	ALTIBN	ZrN-S	nACRo
0.5	0.75	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-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+

2刃 切削條件表 P361 Cutting Condition

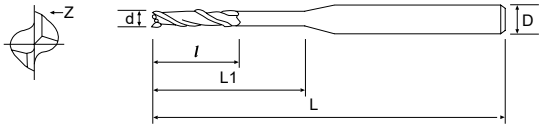
3刃 切削條件表 P362 Cutting Condition

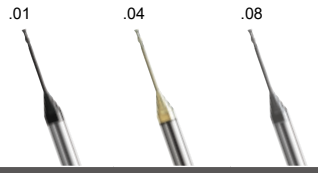
Square Type - Long Neck - 3 flutes

■ 3刃深溝長頸立銑刀

● Ultra Fine Micro Grain Carbide

● WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	l 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-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+

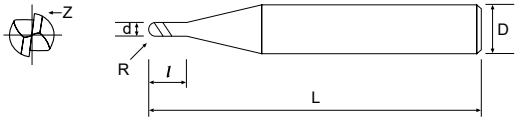
切削條件表 P363
Cutting Condition

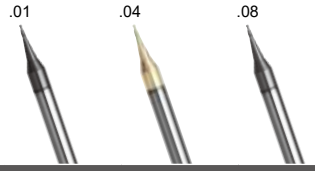
Miniature Ball Nose Type - 2 flutes

■ 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^2 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
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	◎	◎	◎	◎	○		◎	○	○		

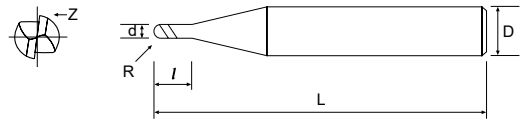
Unit/單位: mm

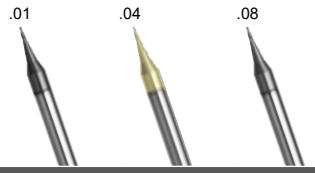
400+ 切削條件表 P363 Cutting Condition

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/mm² 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
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-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+

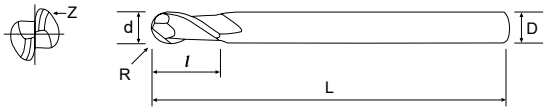
切削條件表 P364
Cutting Condition

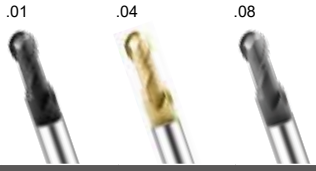
Ball Nose Type - 2 flutes

■ 2刃球型立銑刀

400 PLUS | HRC ▶ 60 | A≠B

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	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 ±0.003 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	◎	◎	◎	◎	○		○				
ZrN-S	◎	◎	◎	○	○			○			
nACRo	◎	◎	◎	◎	○		◎	○	○		

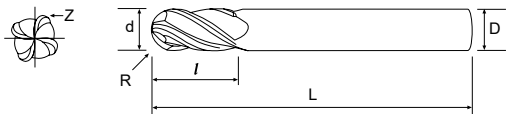
Unit/單位: mm

400+ 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/mm² 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 ±0.003 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	◎	◎	◎	◎	○		○				
ZrN-S	◎	◎	◎	○	○			○			
nACRo	◎	◎	◎	◎	○		◎	○	○		

Unit/單位: mm

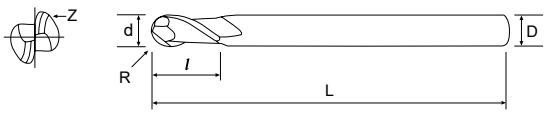
400+

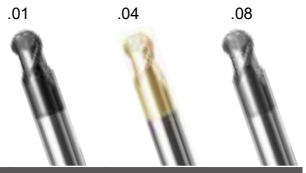
切削條件表 P365
Cutting Condition

Ball Nose Type - Short Flute - 2 flutes

■ 2刃強力短刃球型立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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
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-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	◎	◎	◎	◎	○		◎	○	○		

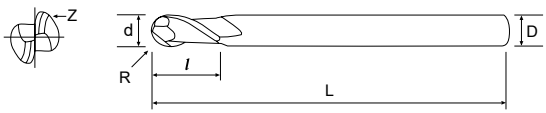
Unit/單位: mm

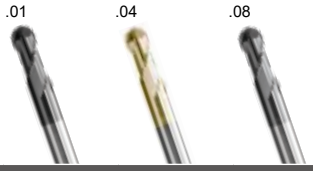
400+ 切削條件表 P365
Cutting Condition

Ball Nose Type - Long Shank - 2 flutes

■ 2刃長柄球型立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	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

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+

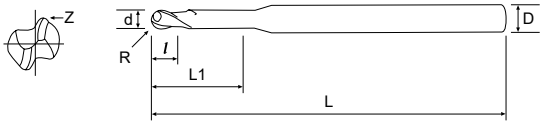
切削條件表 P366-367
Cutting Condition

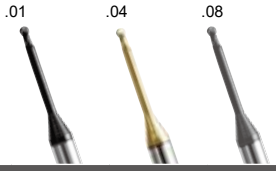
Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

400 PLUS | HRC ▶ 60 | A≠B

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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-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	◎	◎	◎	◎	○		◎	○	○		

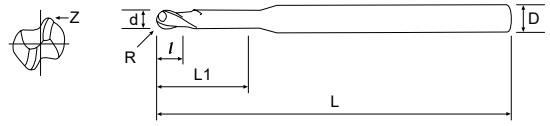
Unit/單位: mm

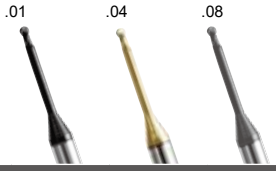
400+ 切削條件表 P366-367 Cutting Condition

Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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
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-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

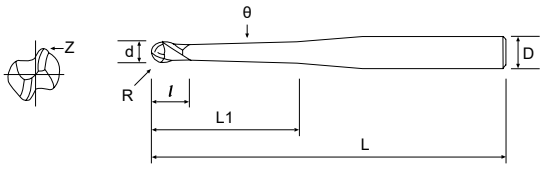
400+ 切削條件表 P368 Cutting Condition

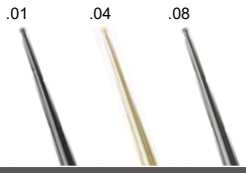
Pencil Neck Ball Nose Type - 2 flutes

■ 2刃深溝斜頸球型立銑刀

400 PLUS | HRC ▶ 60 | A B A≠B

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	l 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-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	◎	◎	◎	◎	○		◎	○	○		

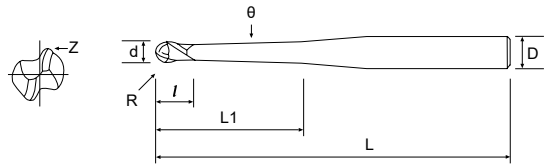
Unit/單位: mm

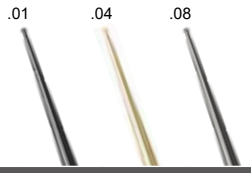
400+ 切削條件表 P368
Cutting Condition

Pencil Neck Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長斜頸球型立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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	l 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

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+

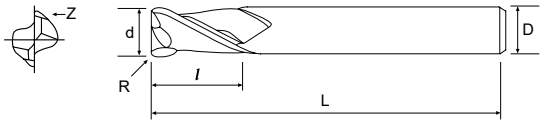
切削條件表 P369
Cutting Condition

Corner Radius Type - 2 flutes

■ 2刃圓鼻立銑刀

400 PLUS | HRC ▶60 | R

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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-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

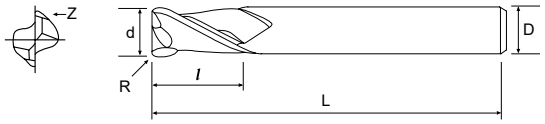
400+

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/mm² 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-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

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

400+

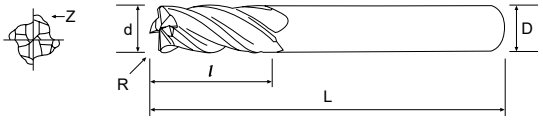
切削條件表 P370
Cutting Condition

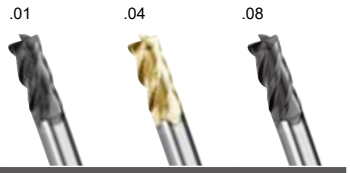
Corner Radius Type - 4 flutes

■ 4刃圓鼻立銑刀

400 PLUS | HRC ▶60 | R

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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+

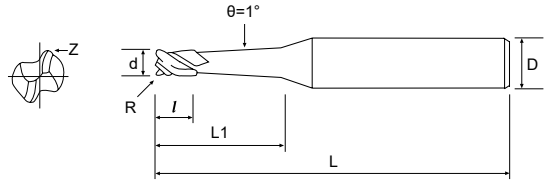
切削條件表 P371
Cutting Condition

Pencil Neck Corner Radius Type - 2 flutes

■ 2刃斜頸圓鼻立銑刀

400 PLUS | HRC ▶60 | A≠B | R

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm2 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
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-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

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

400+

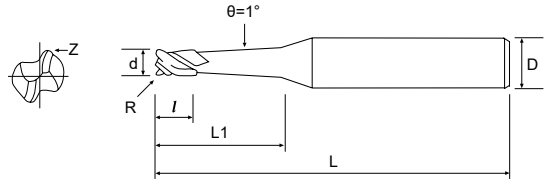
切削條件表 P371
Cutting Condition

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/mm2 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
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-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+

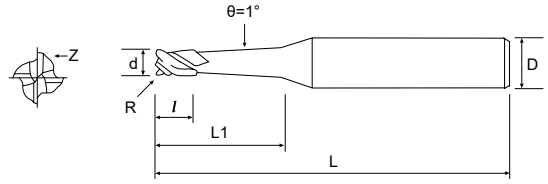
切削條件表 P372
Cutting Condition

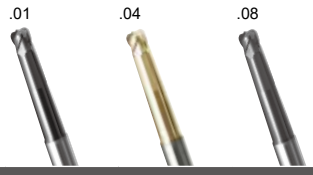
Pencil Neck Corner Radius Type- 4 flutes

■ 4刃斜頸圓鼻立銑刀

400 PLUS | HRC ▶60 | A≠B | R

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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
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-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

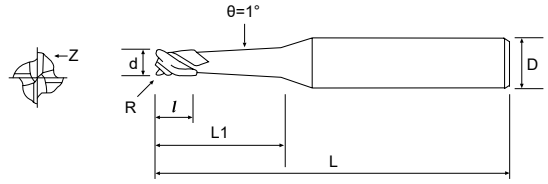
400+

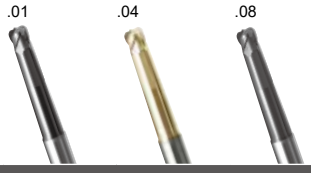
切削條件表 P372
Cutting Condition

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^2 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
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-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	◎	◎	◎	◎	○		◎	○	○		

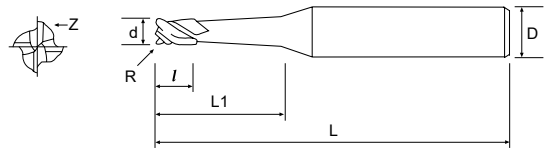
Unit/單位: mm

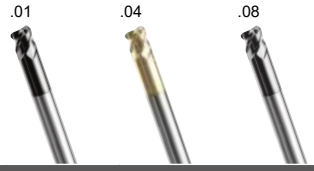
400+ 切削條件表 P373 Cutting Condition

Corner Radius Type- Long Neck - 4 flutes

■ 4刃長頸圓鼻立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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
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

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+

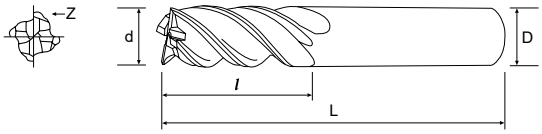
切削條件表 P374-379
Cutting Condition

Square Type - 4 flutes

■ 4刃不等立銑刀

Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 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
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-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+

切削條件表 P374-379
Cutting Condition

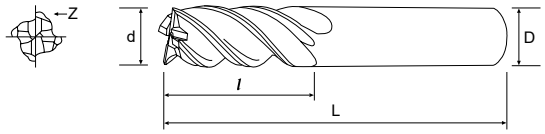
Square Type - Short / Medium / Long Flute

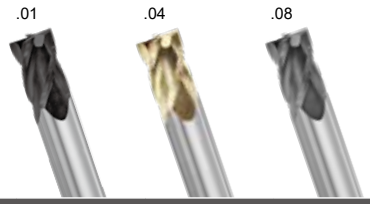
■ 4刃不等立銑刀 – 1倍 / 1.5倍 / 3倍長刃

400 PLUS | HRC ▶55 | A≠B

Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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+

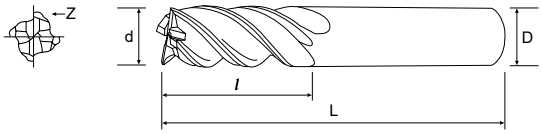
切削條件表 P374-379
Cutting Condition

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/mm² 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-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+

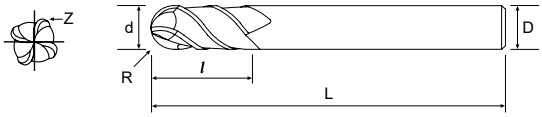
切削條件表 P374-379
Cutting Condition

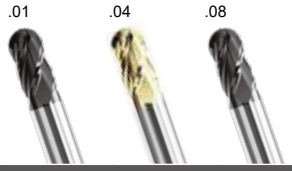
Ball Nose Type - 4 flutes

■ 4刃不等球型立銑刀

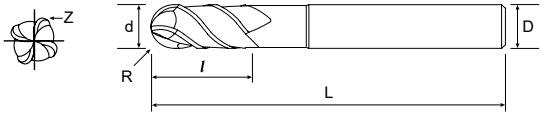
Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	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	l 刃長	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+

切削條件表 P374-379
Cutting Condition

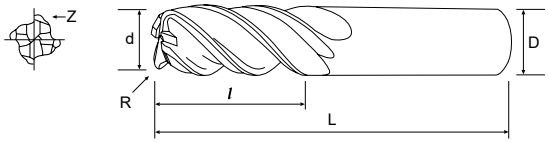
Corner Radius Type - 4 flutes

■ 4刃不等圓鼻立銑刀

400 PLUS | HRC ▶55 | A≠B | R

Ultra Fine Micro Grain Carbide

WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² 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	l 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

SPEED TIGER



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

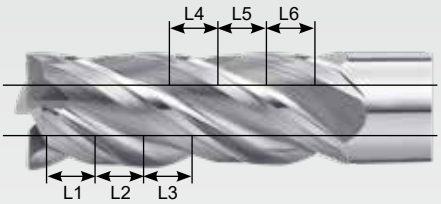
Characteristics 特點

Unequal flute spacing
不等分割



A≠B≠C≠D

Unequal leads
不等導程



L1 ≠ L2 ≠ L3 ≠ L4 ≠ L5 ≠ L6

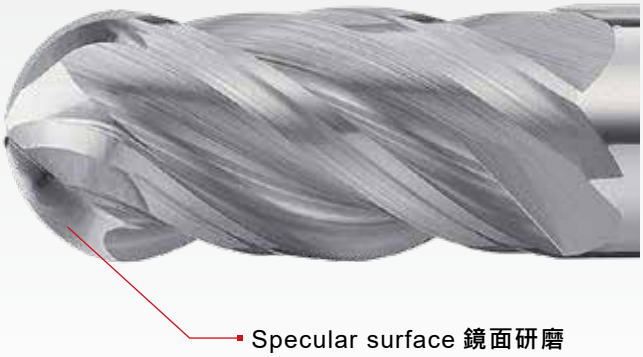
Excellent Anti-vibration effect 振動抑制效果

- 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。

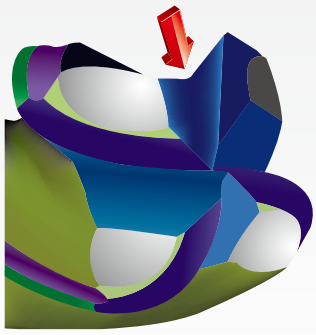
Long tool life 增長刀具壽命

- 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



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



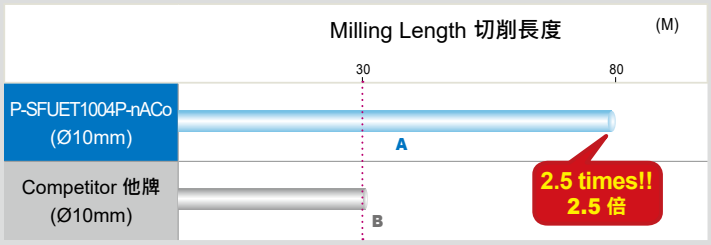
200PLUS square type - surface
200PLUS 平刀-表面





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



A

P-SFUET1004P-nACo :
Picture of wear after milling 60m
P-SFUET1004P-nACo :
加工 60M 的損耗照片

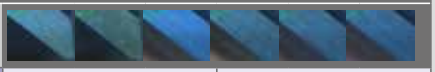


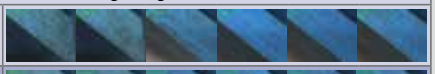
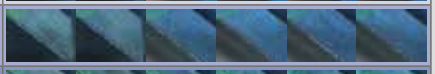
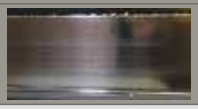
B

Competitor :
Picture of wear after milling 30m
他　　牌 :
加工 30M 的損耗照片

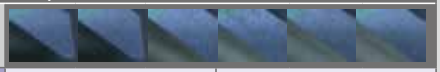


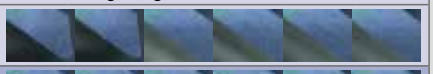
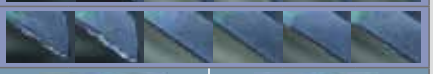
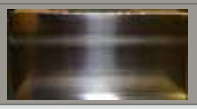
P-SFUET1004P-nACo Tool Life 壽命

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 AP:15 mm AE:0.1 mm 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 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 AP:15 mm AE:0.1 mm 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 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 AP:0.2 mm AE:0.2 mm 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 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%

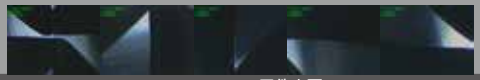
The cutting edge broke 刀具磨損

Before Cutting 測試前 / After Cutting 測試後

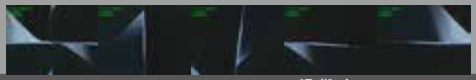




Before Cutting 測試前



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
	

Unit/單位: mm

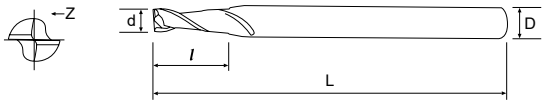
200+ 切削條件表 P380 Cutting Condition

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/mm² 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	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 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	○	○	○	◎	◎	★					

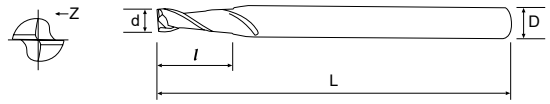
Unit/單位: mm

200+ 切削條件表 P380
Cutting Condition

Miniature Square Type - 2 flutes

■ 2刃微小徑立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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 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+

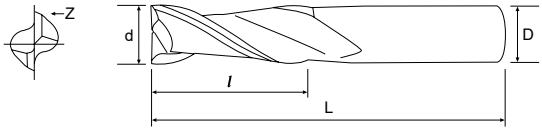
切削條件表 P381
Cutting Condition

Square Type - 2 flutes

■ 2刃立銑刀

200 Nano | HRC ▶65 | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	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	○	○	○	◎	◎	★					

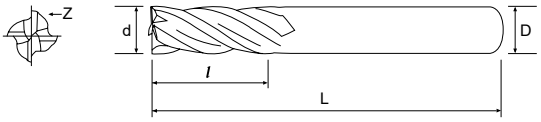
Unit/單位: mm

200+

切削條件表 P381
Cutting Condition

Square Type - 4 flutes

■ 4 刃立銑刀





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 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

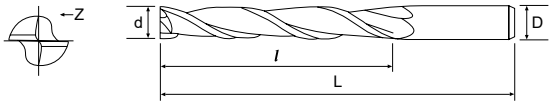
200+ 切削條件表 P383 Cutting Condition

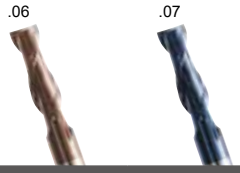
Square Type - Long Flute - 2 flutes

■ 2刃長刃立銑刀

200 PLUS | HRC ▶65 | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	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	○	○	○	◎	◎	★					

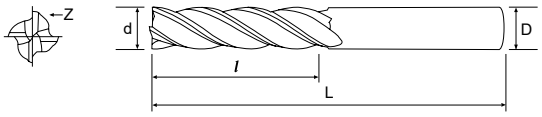
Unit/單位: mm

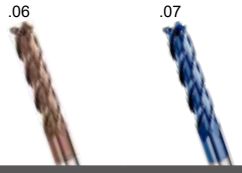
200+ 切削條件表 P384 Cutting Condition

Square Type - Long Flute - 4 flute

■ 4刃長刃立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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

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

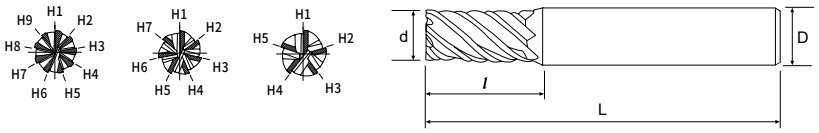
200+

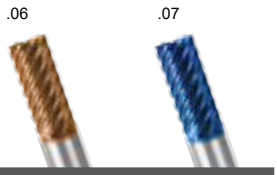
切削條件表 P385
Cutting Condition

Square Type - For Hard Material - Multiple Flutes

■ 多刃高硬度用立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	15	60	6	5	P-SFUVT0605	.06	.07
8	20	60	8	7	P-SFUVT0807	.06	.07
10	25	75	10	7	P-SFUVT1007	.06	.07
12	30	75	12	7	P-SFUVT1207	.06	.07
16	45	100	16	9	P-SFUVT1609	.06	.07
20	45	100	20	9	P-SFUVT2009	.06	.07
25	45	100	25	9	P-SFUVT2509	.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+

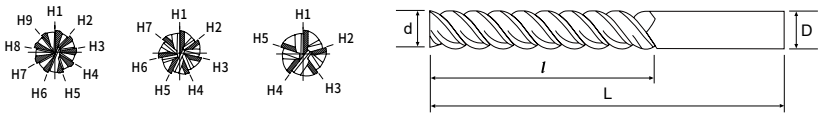
切削條件表 P385
Cutting Condition

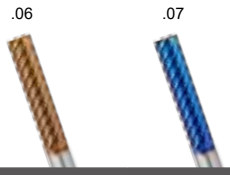
Square Type - Long Flute - Multiple Flutes

■ 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/mm² 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	5	P-SFULVT0605	.06	.07
8	35	100	8	7	P-SFULVT0807	.06	.07
10	45	100	10	7	P-SFULVT1007	.06	.07
12	50	100	12	7	P-SFULVT1207	.06	.07
16	65	150	16	9	P-SFULVT1609	.06	.07
20	75	150	20	9	P-SFULVT2009	.06	.07
25	80	150	25	9	P-SFULVT2509	.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

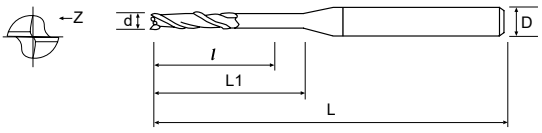
200+ 2刃 切削條件表 P361 Cutting Condition 4刃 切削條件表 P386 Cutting Condition

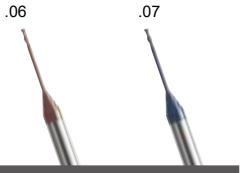
Square Type - Long Neck - 2&4 flutes

■ 2刃4刃深溝長頸立銑刀

200 PLUS | HRC ▶ 65

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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 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	○	○	○	◎	◎	★					

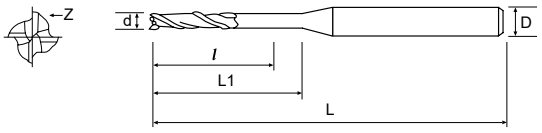
Unit/單位: mm

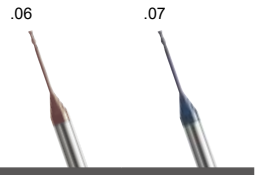
200+ 切削條件表 P386 Cutting Condition

Square Type - Long Neck - 4 flutes

■ 4刃深溝長頸立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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 刃徑	l 刃長	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

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	○	○	○	◎	◎	★					

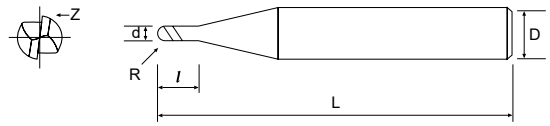
Unit/單位: mm

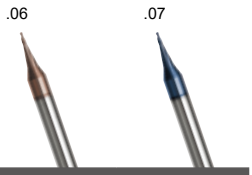
200+ 切削條件表 P387 Cutting Condition

Miniature Ball Nose Type - 2 flutes

■ 2刃微小徑球型立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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
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	○	○	○	◎	◎	★					

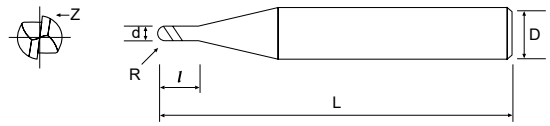
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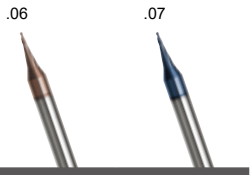
200+ 切削條件表 P387 Cutting Condition

Miniature Ball Nose Type - 2 flutes

■ 2刃微小徑球型立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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
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：

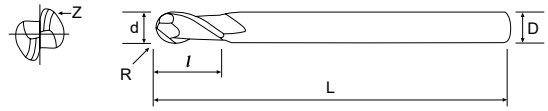
★ Perfect 最推薦　◎ Excellent 適合　○ Good 佳

Coating 塗層	Carbon steel, Alloy steel 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+ 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

R ±0.003 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

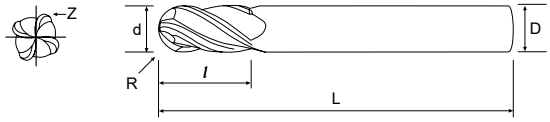
Coating 塗層	Carbon steel, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不鏽鋼	Titanium alloy 鈦合金	Nickel/Inconel alloy 鎳基合金	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
		~45HRC	~50HRC	~55HRC	~60HRC	~65HRC					
TiSiN+	○	○	○	◎	◎	◎					
P-nACo	○	○	○	◎	◎	★					

Unit/單位: mm

200+ 切削條件表 P388
Cutting Condition

Ball Nose Type - 4 flutes
■ 4 刃球型立銑刀

200 PLUS | HRC ▶ 65 | A≠B≠C≠D





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	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 ±0.003 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					
TiSiN+	○	○	○	◎	◎	◎					
P-nACo	○	○	○	◎	◎	★					

Unit/單位: mm

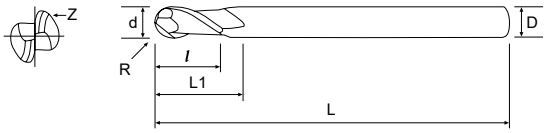
200+ 切削條件表 P389 Cutting Condition

Ball Nose Type - Short Flute - 2 flutes

■ 2刃短刃強力球型立銑刀

200 PLUS HRC ▶65 A B A≠B

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 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	○	○	○	◎	◎	★					

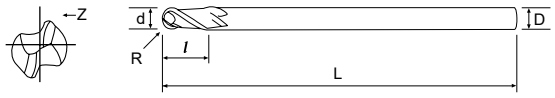
Unit/單位: mm

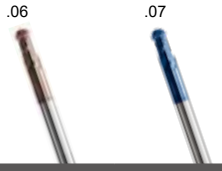
200+ 切削條件表 P389 Cutting Condition

Ball Nose Type - Long Shank - 2 flutes

■ 2刃長柄球型立銑刀

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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 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

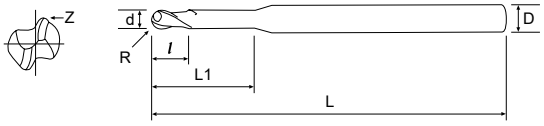
200+ 切削條件表 P366-367
Cutting Condition

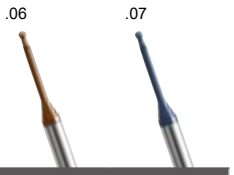
Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

200 PLUS HRC ▶65 A≠B≠C≠D

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 刃長	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

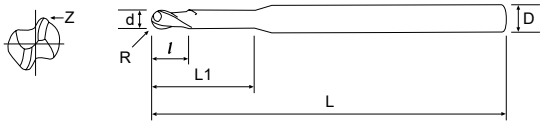
200+ 切削條件表 P366-367
Cutting Condition

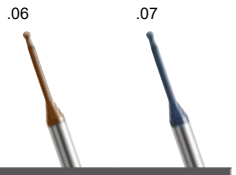
Ball Nose Type - Long Neck - 2 flutes

■ 2刃深溝長頸球型立銑刀

200 PLUS | HRC ▶ 65 | A≠B

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm^2 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	l 刃長	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

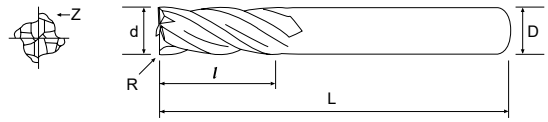
200+ 切削條件表 P390
Cutting Condition

Corner Radius Type - 4 flutes

■ 4 刃圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B≠C≠D | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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

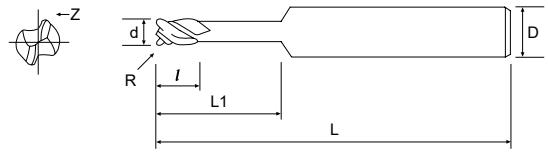
200+ 切削條件表 P391 Cutting Condition

Corner Radius Type – Long Neck & Shank – 2 flutes

■ 2刃長頸長柄圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	0.2	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	○	○	○	◎	◎	★					

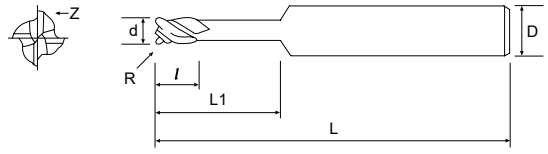
Unit/單位: mm

200+ 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

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	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	0.2	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

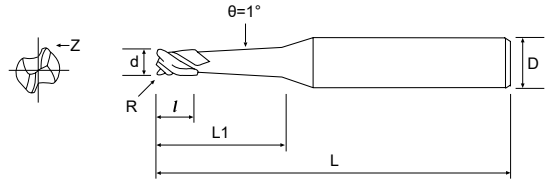
200+ 切削條件表 P393 Cutting Condition

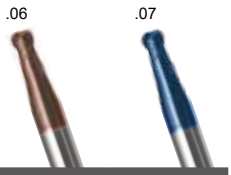
Pencil Neck Type - Corner Radius - 2 flutes

■ 2刃斜頸圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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
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 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+ 切削條件表 P393 Cutting Condition

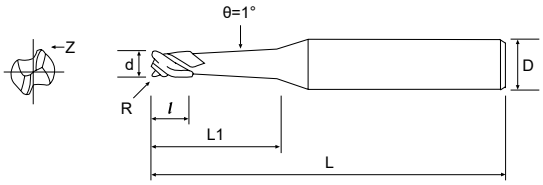
Pencil Neck Type – Corner Radius - 2 flutes

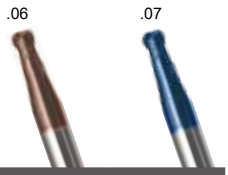
■ 2刃斜頸圓鼻立銑刀

200 PLUS | HRC ▶ 65

● Super Ultra Fine Micro Grain Carbide

● WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	0.3	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

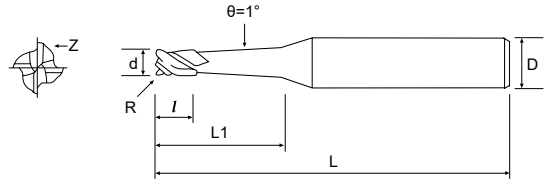
200+ 切削條件表 P394 Cutting Condition

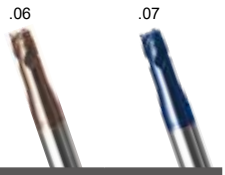
Pencil Neck Type – Corner Radius - 4 flutes

■ 4刃斜頸圓鼻立銑刀

200 PLUS | HRC ▶65 | R

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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
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

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

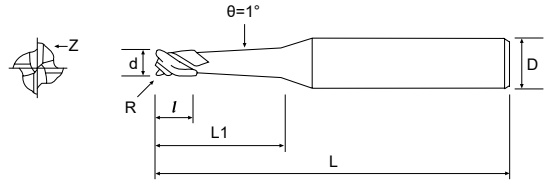
200+ 切削條件表 P394 Cutting Condition

Pencil Neck Type - Corner Radius - 4 flutes

■ 4刃斜頸圓鼻立銑刀

200 PLUS | HRC ▶ 65 | R | A≠B≠C≠D | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm^2 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

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

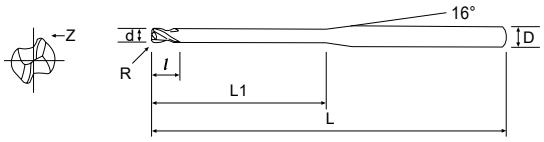
200+ 切削條件表 P395 Cutting Condition

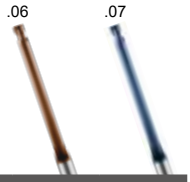
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶ 65 | R | A B A≠B | L3 L4 L1 L2 L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	ℓ 刃長	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 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

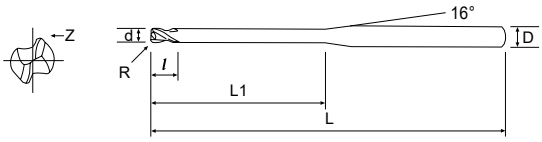
200+ 切削條件表 P395 Cutting Condition

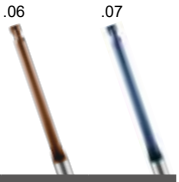
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 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

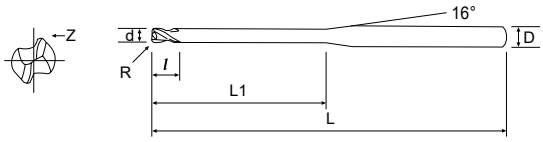
200+ 切削條件表 P395 Cutting Condition

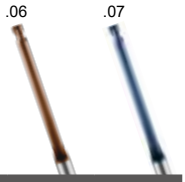
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶ 65 | R | A B A≠B | L3 L4 L1 L2 L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	ℓ 刃長	L1 有效長	L 全長	D 柄徑	0.5°	1°	1.5°	2°	3°	型號	TiSiN+	P-nACo
1.5	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 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

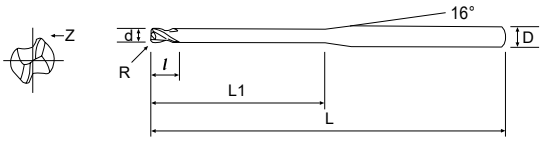
200+ 切削條件表 P395 Cutting Condition

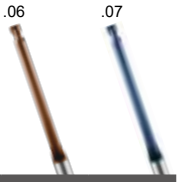
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 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

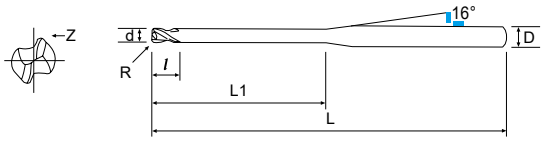
200+ 切削條件表 P395 Cutting Condition

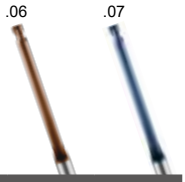
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶ 65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	ℓ 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

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

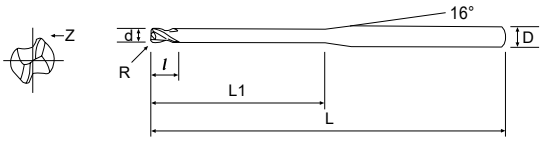
200+ 切削條件表 P395 Cutting Condition

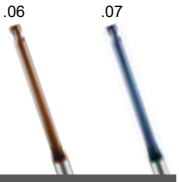
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶65 | R | A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 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

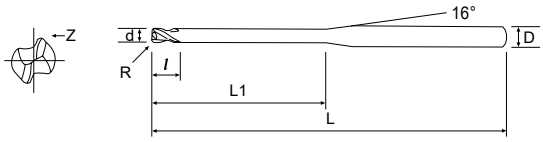
200+ 切削條件表 P395 Cutting Condition

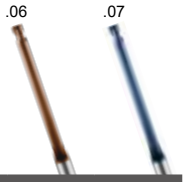
Long Neck Type - Corner Radius - 2 flutes

■ 2刃深溝長頸圓鼻立銑刀

200 PLUS | HRC ▶ 65 | R | A B A≠B | L1≠L2≠L3≠L4

- Super Ultra Fine Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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	l 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-SFUCR050102(EL20)	.06	.07
5	1	5	40	100	6	41.47	*	*	*	*	P-SFUCR050102(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 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

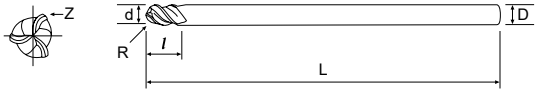
200+ 切削條件表 P396 Cutting Condition

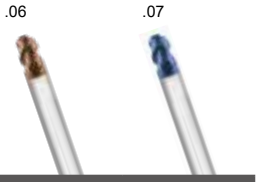
Ball Nose Type - 3 different flutes

■ 3刃不等分割球刀

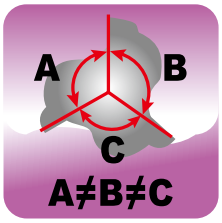
200 PLUS | HRC ▶65 | A≠B≠C

- Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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 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

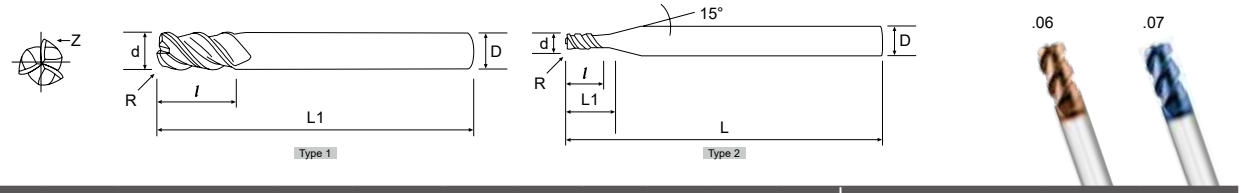
200+ 切削條件表 P397 Cutting Condition

Corner Radius Type - 3 flutes

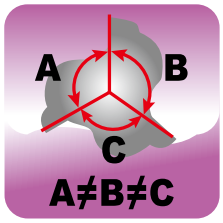
■ 3刃不等分割圓鼻刀

200 PLUS | HRC ▶65 | R | A≠B≠C

- Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm² 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



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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

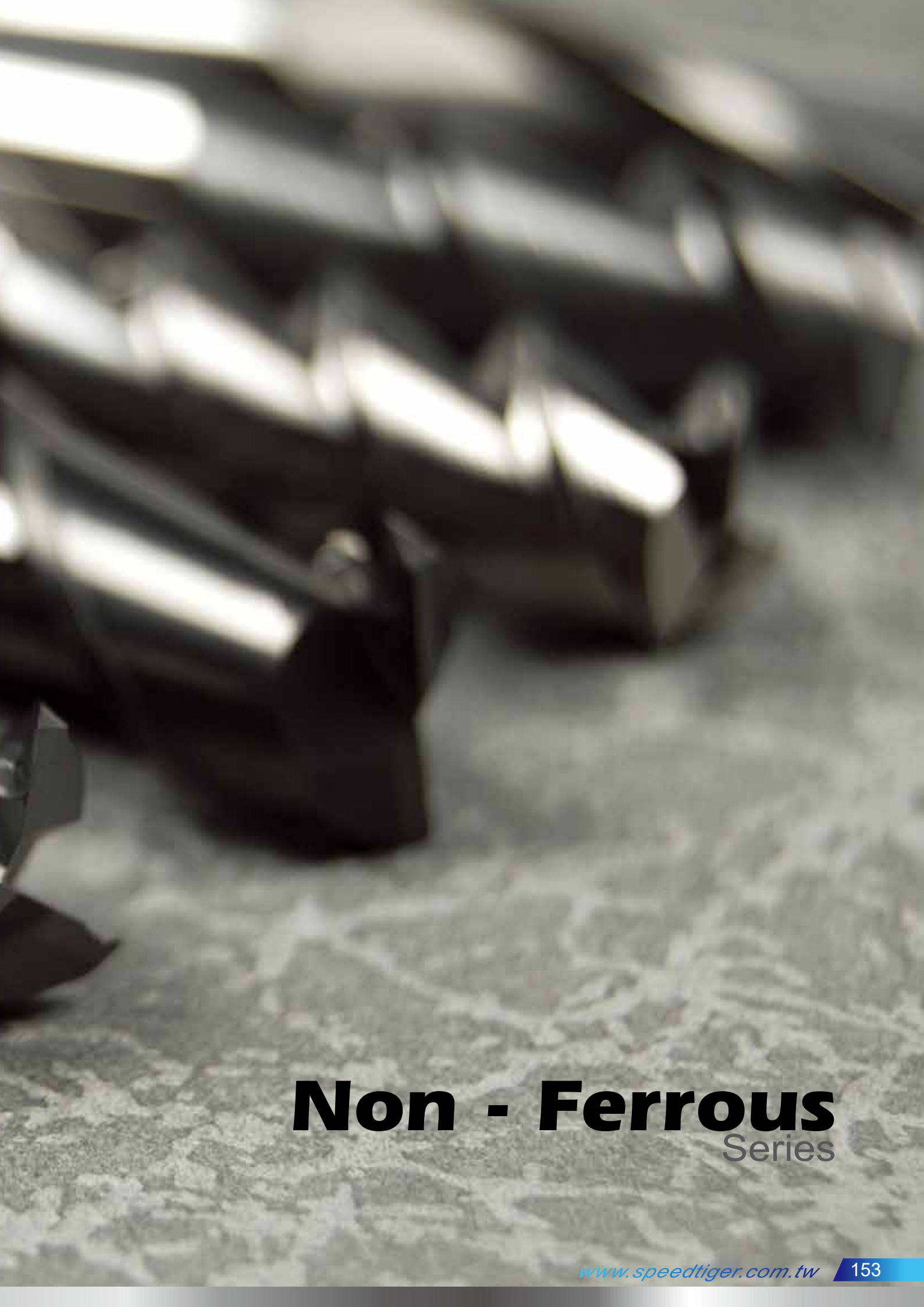
Application 適用材質：

★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳

Coating 塗層	Carbon steel, Alloy steel 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 P398
Cutting Condition

Square Type - For Wood & Plastic

■ 塑膠、木工用立銑刀

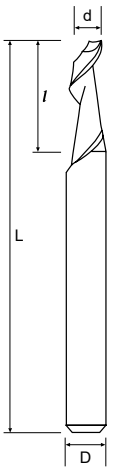
600 Nano

30°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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	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

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-harden 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	plastic 塑膠	Wood 木工
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC					
									○	◎

Unit/單位: mm

切削條件表 P398
Cutting Condition

Square Type - For Wood & Plastic

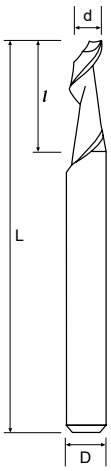
■ 塑膠、木工用立銑刀

600 Nano | 30° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金	plastic 塑膠	Wood 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　55°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm

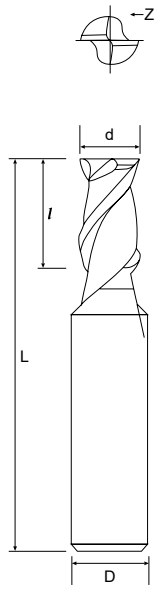


切削條件表 P399
Cutting Condition

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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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^2 Grain Size=0.6μm

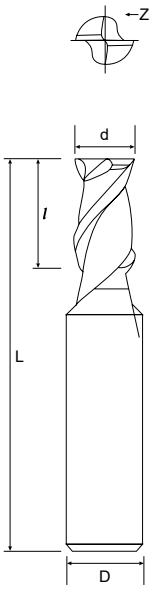


切削條件表 P399
Cutting Condition

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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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°

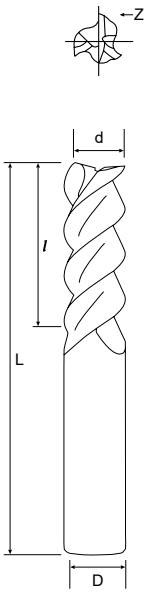
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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^2 Grain Size=0.6μm

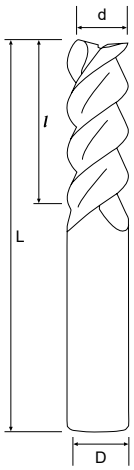


切削條件表 P402
Cutting Condition

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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							○	◎

Unit/單位: mm

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

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°

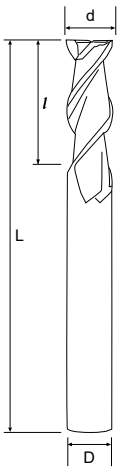
● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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	4	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





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-harden 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 P399
Cutting Condition

Specular Square Type - For Aluminum - 2 flutes

■ 2刃全鏡面鋁用立銑刀

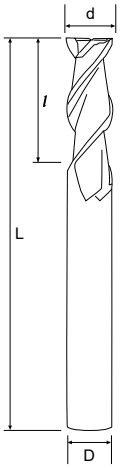
600 Nano | 45° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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	4	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





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-harden 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

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

切削條件表 P402
Cutting Condition

Specular Square Type - For Aluminum - 3 flutes

■ 3刃全鏡面鋁用立銑刀

600 Nano

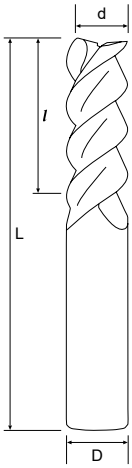
45°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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





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-harden 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 P402
Cutting Condition

Specular Square Type - For Aluminum - 3 flutes

■ 3刃全鏡面鋁用立銑刀

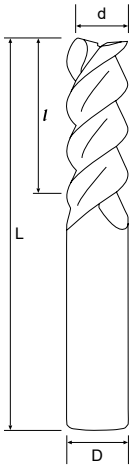
600 Nano | 45° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							○	◎

Unit/單位: mm

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

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

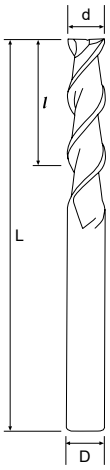
600 Nano | 45° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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





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-harden 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 P403
Cutting Condition

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

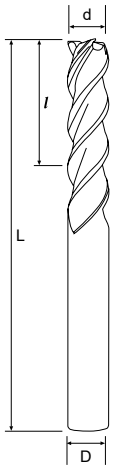
600 Nano | 45° | TB

■ 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^2 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

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-harden 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

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

切削條件表 P404
Cutting Condition

Roughing Type - For Aluminum - 3 flutes

■ 3刃鋁用粗銑刀

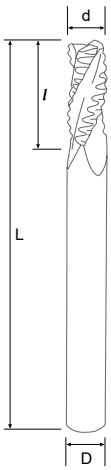
600 Nano

45°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P404
Cutting Condition

Roughing Type - For Aluminum - 3 flutes

■ 3刃鋁用粗銑刀

600 Nano | 45° | TB

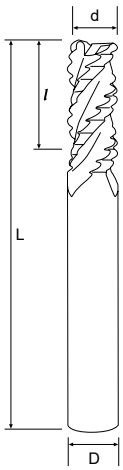
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							○	◎

Unit/單位: mm

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

切 削 條件表 P405
Cutting Condition

Square Type - For Copper - 2 flutes

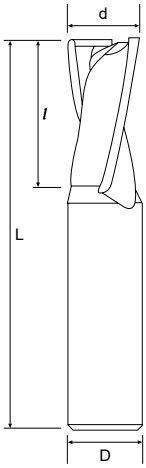
■ 2刃銅合金專用立銑刀

600 Nano 25°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	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 P405
Cutting Condition

Square Type - For Copper - 2 flutes

■ 2刃銅合金專用立銑刀

600 Nano | 25° | TB

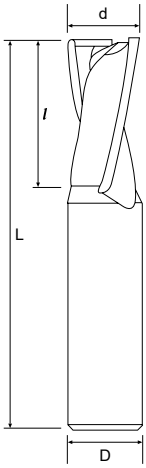
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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





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-harden 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

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

切削條件表 P406
Cutting Condition

Square Type - Long Neck - For Copper - 2 flutes

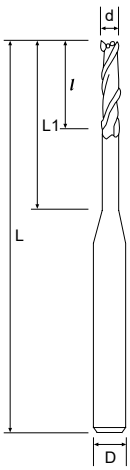
■ 2刃銅合金深溝頸立銑刀

600 Nano | 25° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 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°

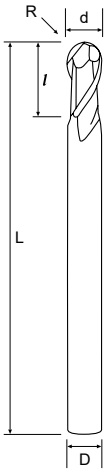
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							◎	◎

Unit/單位: mm

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

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

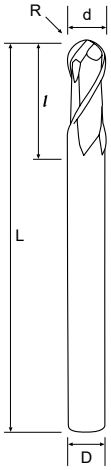
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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, 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	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 P407
Cutting Condition

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

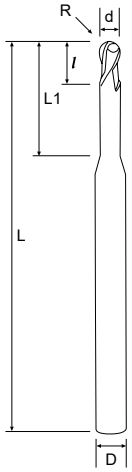
■ 2刃長頸銅鋁球型立銑刀

600 Nano | 25° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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^2 Grain Size=0.6μm

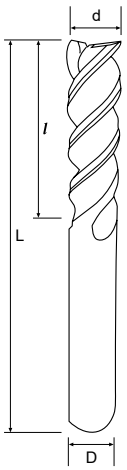


MODE	Diameter	Flute Length	Full Length	Shank Diameter	Flutes
型號	d 刃徑	l 刃長	L 全長	D 柄徑	Z 刃數
AUE0253	2.5	8	50	6	3
AUE0303	3	9	50	6	3
AUE0403	4	12	50	6	3
AUE0503	5	15	50	6	3
AUE0603	6	18	50	6	3
AUE0803	8	20	60	8	3
AUE1003	10	30	75	10	3
AUE1203	12	32	75	12	3
AUE1603	16	45	100	16	3
AUE2003	20	45	100	20	3

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



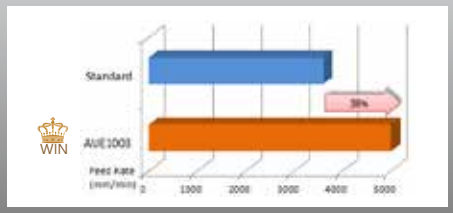


※Special U-Type design:
Material removal rate (MRR) and surface finishes are greatly improved due to effective chip removal at high rate

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

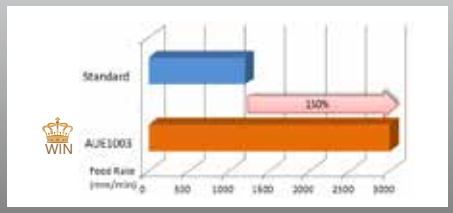
※Sharp aluminum alloy tooth design Applicable for roughing and finishing

Feed Rate Comparsion (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 Comparsion (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, 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	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 P410
Cutting Condition

High Feed Ball Nose Type For Aluminum - 2 flutes

■ 2刃鋁用高速球型立銑刀

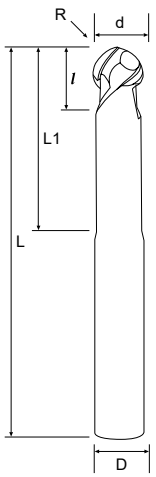
400 Nano | 50° | TB

- Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm2 Grain Size=0.4μm



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
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





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-harden 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 P408
Cutting Condition

High Feed Corner Radius Type For Aluminum 3 flutes

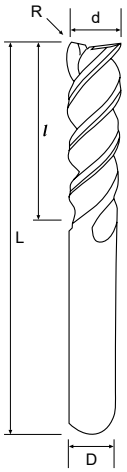
■ 3刃超高速鋁用圓鼻刀

600 Nano 50°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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

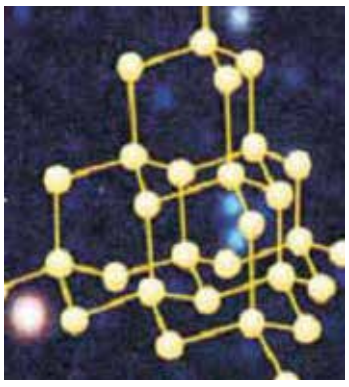
Strong tooth with double relief angles:
Excellent production rates become 100% possible due to the improvement of tooth hardness.
高強度雙離隙刀刃：
刀刃強度提升、實現了穩定的高效率加工

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



▲ Molecular Structure 分子結構圖

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	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

Unit/單位: mm

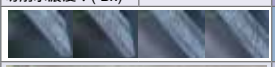
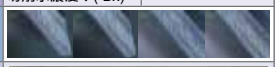
切削條件表 P408
Cutting Condition

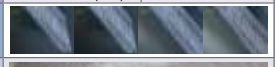
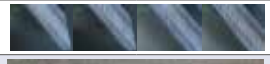
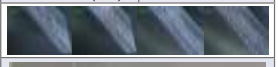
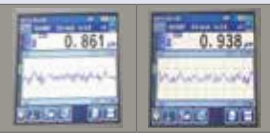
600 Nano | 50° | TB

Specification 規格

MODE 型號	Diameter d 刃徑	Flute Length ℓ 刃長	Efficient Length L1 有效長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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 刀具使用前				
綜位參數 Parameter	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.36mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:12312mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 180% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.39mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:13338mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 180% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.42mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:14364mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 178% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.45mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:15390mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 174% 10.5°Bx
After Cutting 刀具使用後				
工件表面 Work Surface				
粗糙度 Surface Roughness(Ra)				

	11th 第 11 次	12th 第 12 次	13th 第 13 次	14th 第 14 次
Before Cutting 刀具使用前				
綜位參數 Parameter	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.48mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:16416mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 174% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.51mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:17442mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 173% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.54mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:18468mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 173% 10.5°Bx	Cutting Condition 使用參數： Machine 使用 CNC 機台： Coolant 冷卻方式： Work Material 切削素材： Tool 測試刀款： Holder 使用刀桿： Tool's Clamping Length 刀具夾持長度： Cutting Length 切削長度： Runout of Tool 刀具偏擺： Load of Spindle 主軸負載： Concentration of cutting water 切削水濃度：(°Bx)	Fz:0.57mm/ 刃 Vc:358m/min AP:10mm AE:10mm S:11400min F:19494mm/min YCM 永進 FV102A Wet Cutting 水冷 AL6061 S-AUE1003 BT40 Pull Back Holder 後拉式刀桿 37mm 0.1m 米 0.002mm 169% 10.5°Bx
After Cutting 刀具使用後				
工件表面 Work Surface				
粗糙度 Surface Roughness(Ra)				

Unit/單位: mm

切削條件表 P411
Cutting Condition

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

■ 3刃超高速鋁用立銑刀(航太用)

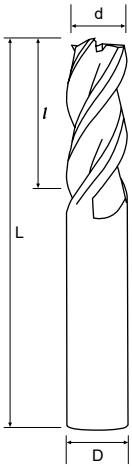
600 Nano | 40° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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





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-harden 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

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

切削條件表 P412
Cutting Condition

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

■ 3刃超高速鋁用長頸立銑刀(航太用)

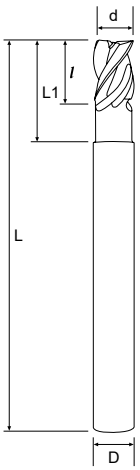
600 Nano | 40° | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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





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-harden 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 P413
Cutting Condition

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

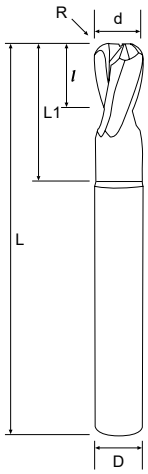
■ 2刃鋁用高速圓鼻立銑刀(航太用)

600 Nano | 40° | R | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm







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
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, 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	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 P414
Cutting Condition

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

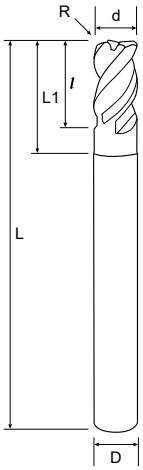
■ 3刃鋁用高速圓鼻立銑刀(航太用)

600 Nano | 40° | R | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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	l 刃長	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

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-harden 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 P415-416
Cutting Condition

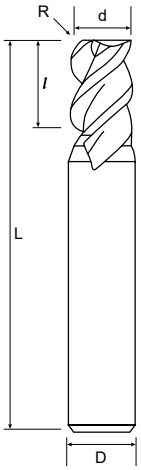
Super High Speed Corner Radius Type - For Aluminum (Aerospace) - 3 flutes

■ 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^2 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

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-harden 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 P415-416
Cutting Condition

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

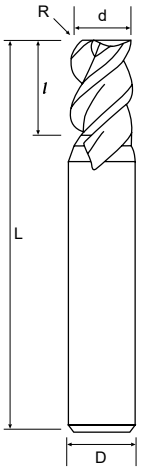
■ 3刃超高速鋁用圓鼻立銑刀(航太用)

600 Nano | 40° | R | TB

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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			
							○	◎

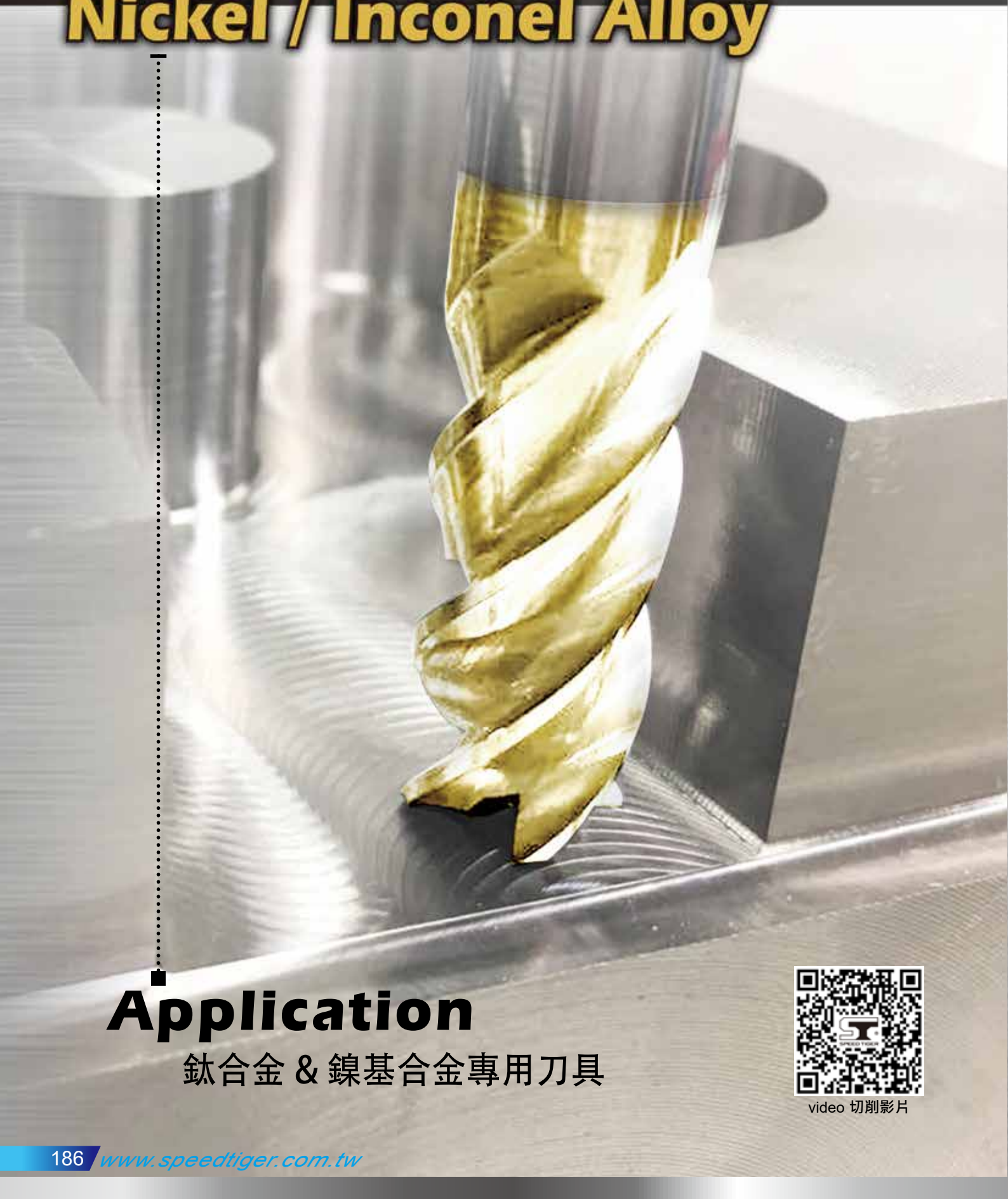
Unit/單位: mm



Functional Series

For Titanium 鈦利嗨系列 Nickel / Inconel Alloy

NEW



Application

鈦合金 & 鎳基合金專用刀具

video 切削影片

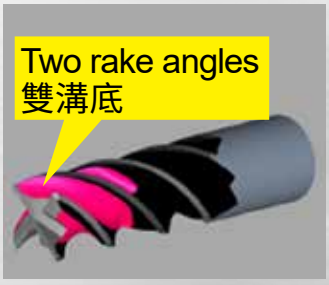
Anti-Vibration



Unequal Flute Spacing
不等分割



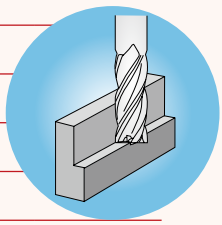
Unequal Helix Angle
不等螺旋

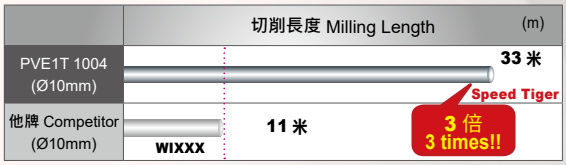


Special Flute Geometry
特殊刃部幾何設計

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%

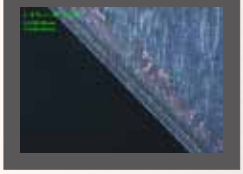
工具 Tool	PVE1T1004		
工件 Work Material	Titanium Ti-6Al-4V		
加工方式 Milling Type	側銑 Side milling		
切削速度 Milling Speed	79m/min		
轉速 Rotation Speed (S)	2500rpm		
進給速度 Feed Rate (F)	450mm/min		
每刃進給量 Feed of teeth (fz)	0.045mm		
切深 Depth of cut	ap=20mm ae=3mm	冷卻方式 Cooling Way	水冷 watercoolant
使用機台 Machine	立式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





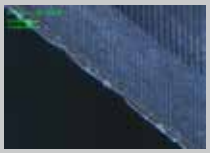
Speed Tiger

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



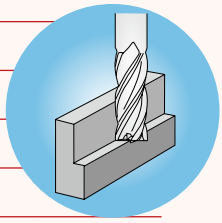
WIXXX

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

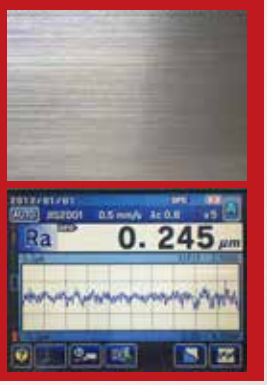


震虎鈦合金專用刀能夠有效減少加工時產生的震顫，銑出良好的加工表面
Speed Tiger New Series for Titanium Application enable to operate stable without chipping and produce a superb surface finish.

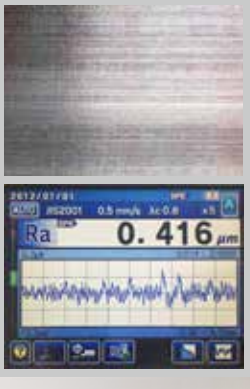
工具 Tool	PVE1T1004		
工件 Work Material	Titanium Ti-6Al-4V		
加工方式 Milling Type	側銑 Side milling		
切削速度 Milling Speed	79m/min		
轉速 Rotation Speed (S)	2500rpm		
進給速度 Feed Rate (F)	450mm/min		
每刃進給量 Feed of teeth (fz)	0.045mm		
切深 Depth of cut	ap=20mm ae=3mm	冷卻方式 Cooling Way	水冷 water coolant
使用機台 Machine	立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



PVE1T1004：加工表面良好
Favorable Machined Surface



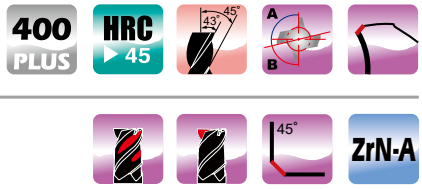
他牌：一般加工表面
Competitor：General Machined Surface



Unit/單位: mm

切削條件表 P417
Cutting Condition

Square Type For Exotic Materials
■ 難切削材專用立銑刀



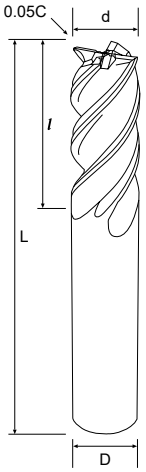


Roughing 粗銑 Finishing 精修

MODE	Diameter	Flute Length	Full Length	Shank Diameter	Flutes	Corner Chamfer Width
型號	d 刃徑	l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





Long Flute

Roughing 粗銑 Finishing 精修

MODE	Diameter	Flute Length	Full Length	Shank Diameter	Flutes	Corner Chamfer Width
型號	d 刃徑	l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：

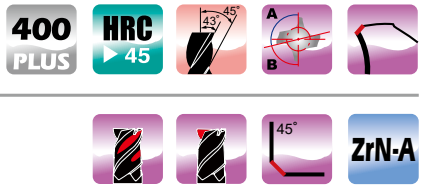
★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳

<30HRC	30~40HRC	40~50HRC	50~65HRC	Carbon steel, Alloy steel 炭素鋼，合金鋼	Stainless steel 不鏽鋼	Titanium alloy 鈦合金	Nickel/Inconel alloy 鎳基合金	Aluminum alloy 鋁合金	Copper alloy 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



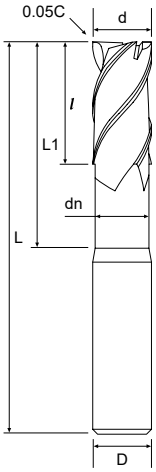


Roughing 粗銑　Finishing 精修

MODE	Diameter	Flute Length	Efficient Length	Neck Diameter	Full Length	Shank Diameter	Flutes	Corner Chamfer Width
型號	d 刃徑	l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：

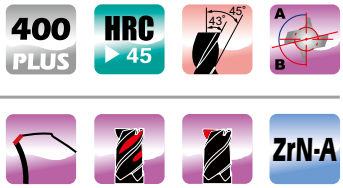
★ Perfect 最推薦　◎ Excellent 適合　○ Good 佳

<30HRC	30~40HRC	40~50HRC	50~65HRC	Carbon steel, Alloy steel 炭素鋼，合金鋼	Stainless steel 不鏽鋼	Titanium alloy 鈦合金	Nickel/Inconel alloy 鎳基合金	Aluminum alloy 鋁合金	Copper alloy 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



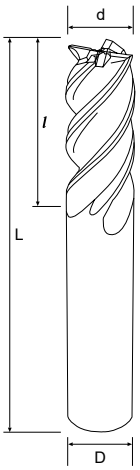


Roughing 粗銑　Finishing 精修

MODE 型號	Diameter d 刃徑	Flute Length l刃長	Full Length L全長	Shank Diameter D柄徑	Flutes 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





Application 適用材質：

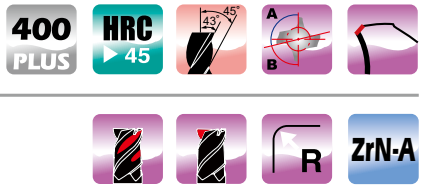
★ Perfect 最推薦　◎ Excellent 適合　○ Good 佳

<30HRC	30~40HRC	40~50HRC	50~65HRC	Carbon steel, Alloy steel 炭素鋼，合金鋼	Stainless steel 不鏽鋼	Titanium alloy 鈦合金	Nickel/Inconel alloy 鎳基合金	Aluminum alloy 鋁合金	Copper alloy 銅合金
	◎	○				◎	◎		

Unit/單位: mm

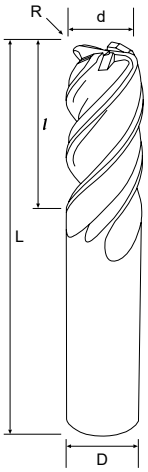
切削條件表 P418
Cutting Condition

Corner Radius Type For Exotic Materials
■ 難切削材專用圓鼻立銑刀









Roughing 粗銑　Finishing 精修

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
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, Alloy steel 炭素鋼，合金鋼	Stainless steel 不鏽鋼	Titanium alloy 鈦合金	Nickel/Inconel alloy 鎳基合金	Aluminum alloy 鋁合金	Copper alloy 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



Unit/單位: mm

RS Series

Technical Data

Details 產品特點



瞭解RS塗層 Feature of RS coating

- 抗熱 Oxidation start temperature : 1,000℃
- 硬度 Hardness: 2,800HV
- 摩擦係數 Coefficient of friction : 0.4
- 薄膜厚度 Thickness (μ) : 3~ 4 μ
  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℃
- 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℃.

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

Unit/單位: mm

切削條件表 P332
Cutting Condition

Miniature Square Type - 2 flutes

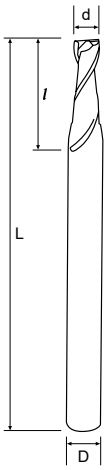
■ 2刃微小徑立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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

Application 適用材質：

★ Perfect 最推薦　◎ Excellent 適合　○ Good 佳

Arial Unicode MS	Pre-harden 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 P332
Cutting Condition

Square Type - Helix angle 45°- 2 flutes

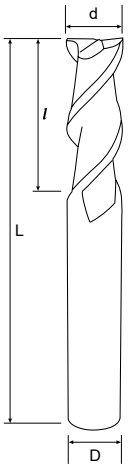
■ 2刃45° 立銑刀

600 Nano | HRC ▶50 | 45° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P419
Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

■ 3刃45° 立銑刀

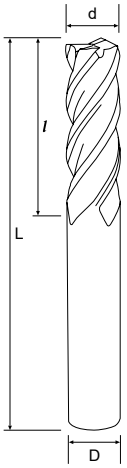
600 Nano | HRC ▶ 50 | 45° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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





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-harden 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 P419
Cutting Condition

Square Type - Helix Angle 45° - 3 flutes

■ 3刃45° 立銑刀

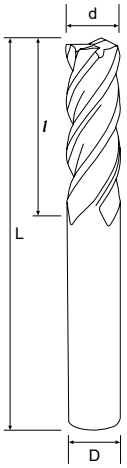
600 Nano | HRC ▶50 | 45° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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
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





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-harden 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 P336-337
Cutting Condition

Square Type - Helix angle 45°- 4 flutes

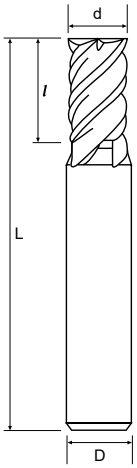
■ 4刃45° 立銑刀

600 Nano | HRC ▶50 | 45° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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, 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	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 P420
Cutting Condition

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

■ 4刃45° 長刃立銑刀

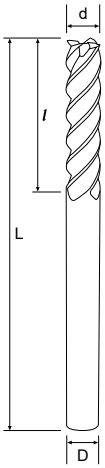
600 Nano | HRC ▶ 50 | 45° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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





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-harden 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 P358
Cutting Condition

Square Type - Long Flute - 2 flutes

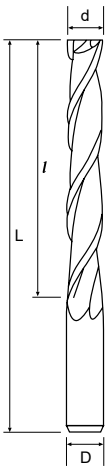
■ 2刃長刃立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P359
Cutting Condition

Square Type - Long Flute - 4 flutes

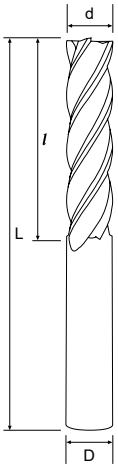
■ 4刃長刃立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
SULET0104	1	6	50	4	4
SULET0154	1.5	9	50	4	4
SULET0204	2	12	50	4	4
SULET0254	2.5	12	50	4	4
SULET0304	3	15	60	6	4
SULET0354	3.5	15	60	6	4
SULET0404	4	20	75	6	4
SULET0454	4.5	20	75	6	4
SULET0504	5	25	75	6	4
SULET0554	5.5	25	75	6	4
SULET0604	6	30	75	6	4
SULET0704	7	30	100	8	4
SULET0804	8	40	100	8	4
SULET0904	9	40	100	10	4
SULET1004	10	40	100	10	4
SULET1104	11	40	100	12	4
SULET1204	12	50	100	12	4
SULET1404	14	50	150	16	4
SULET1604	16	60	150	16	4
SULET2004	20	90	200	20	4

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-harden 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

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

切削條件表 P406
Cutting Condition

Square Type - Long Neck - 2 flutes

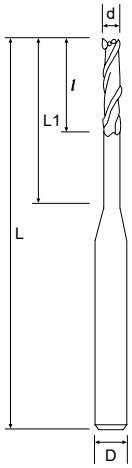
■ 2刃深溝專用長頸立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P406
Cutting Condition

Square Type - Long Neck - 2 flutes

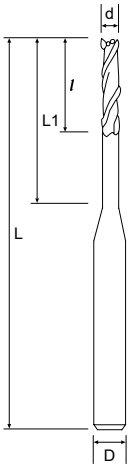
■ 2刃深溝專用長頸立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	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 P342
Cutting Condition

Fine Pitch Roughing Type - 3 flutes

■ 3刃粗精銑刀

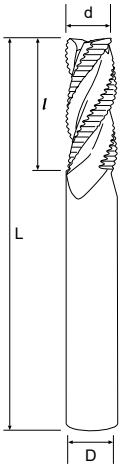
600 Nano | HRC ▶ 50 | 40° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



MODE 型號	Diameter d 刃徑	Flute Length *l* 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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





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-harden 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 P343
Cutting Condition

Fine Pitch & Roughing Type - 4 flutes

■ 4刃粗精銑刀

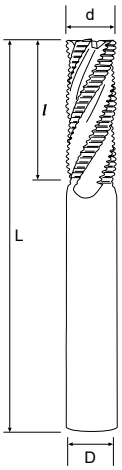
600 Nano | HRC ▶ 50 | 40° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



MODE 型號	Diameter d 刃徑	Flute Length l 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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





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-harden 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 P344
Cutting Condition

Roughing Type - 3 flutes

■ 3刃粗銑刀

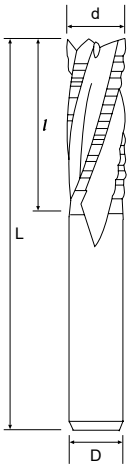
600 Nano | HRC ▶ 50 | 25° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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





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-harden 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 P345
Cutting Condition

Roughing Type - 4 flutes
■ 4刃粗銑刀

600 Nano | HRC ▶ 50 | 25° | RS

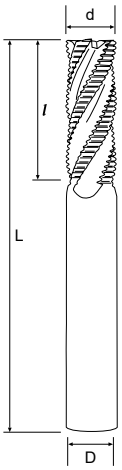
Micro Grain Carbide

WC=90 Co=10 HV30=1571 Rupture=3750N/mm² 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





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-harden 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 P347-348
Cutting Condition

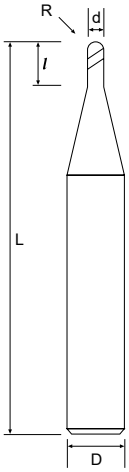
Miniature Ball Nose Type - 2 flutes
■ 2刃微小徑球型立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P347-348
Cutting Condition

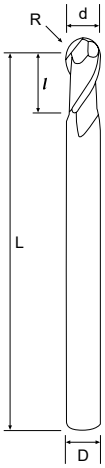
Ball Nose Type - 2 flutes
■ 2刃球型立銑刀

600 Nano | HRC ▶50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	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 P421
Cutting Condition

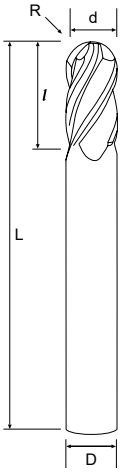
Ball Nose Type - 4 flutes
■ 4刃球型立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P347-348
Cutting Condition

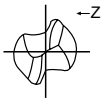
Ball Nose Type - Long Shank - 2 flutes

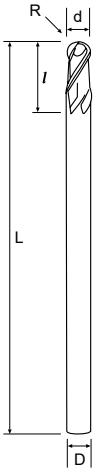
■ 2刃長柄球型立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
SULBTM0352	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
SULBTM1002	10	5	20	100	10	2
SULBTL1002	10	5	20	150	10	2
SULBTX1002	10	5	20	200	10	2
SULBTM1202	12	6	24	100	12	2
SULBTL1202	12	6	24	150	12	2
SULBTX1202	12	6	24	200	12	2
SULBTL1602	16	8	32	150	16	2
SULBTX1602	16	8	32	200	16	2

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-harden 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 P407
Cutting Condition

Ball Nose Type - Long Neck - 2 flutes

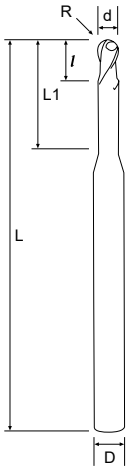
■ 2刃深溝長頸球型立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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

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-harden 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 P407
Cutting Condition

Ball Nose Type - Long Neck - 2 flutes

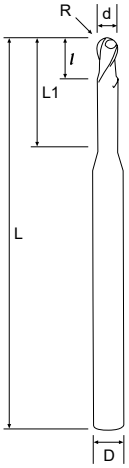
■ 2刃深溝長頸球型立銑刀

600 Nano | HRC ▶ 50 | 35° | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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	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 P422
Cutting Condition

Corner Radius Type - 3 flutes

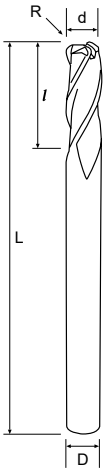
■ 3刃圓鼻立銑刀

600 Nano | HRC ▶50 | 30° | R | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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

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-harden 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 P422
Cutting Condition

Corner Radius Type - 3 flutes

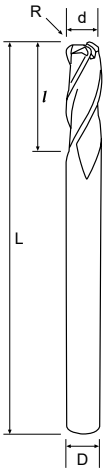
■ 3刃圓鼻立銑刀

600 Nano | HRC ▶50 | 30° | R | RS

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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
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

Application 適用材質：

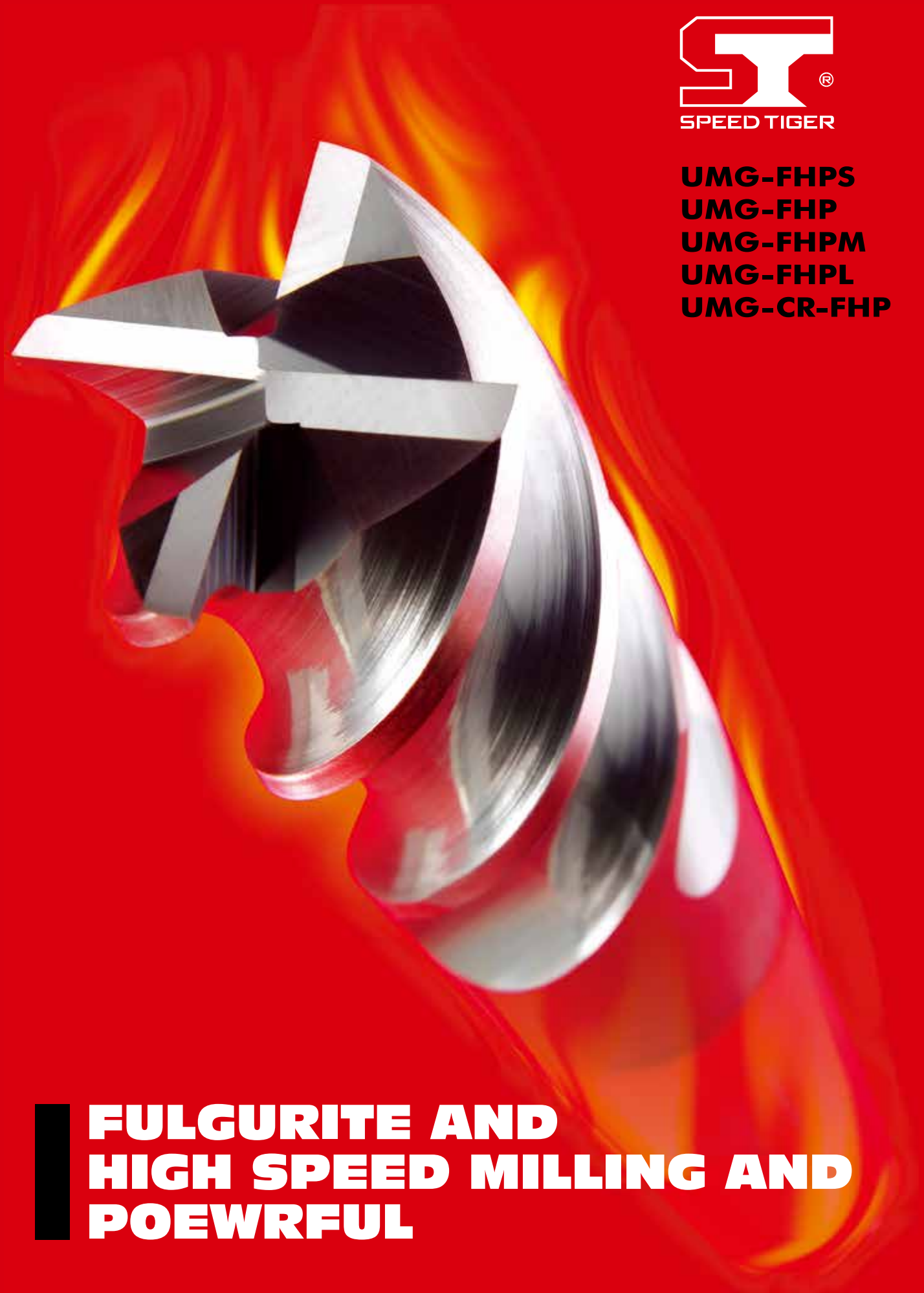
★ Perfect 最推薦　◎ Excellent 適合　○ Good 佳

carbon steel, Alloy steel 炭素鋼 ,合金鋼	Pre-harden 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

SPEED TIGER

UMG-FHPS
UMG-FHP
UMG-FHPM
UMG-FHPL
UMG-CR-FHP



FULGURITE AND HIGH SPEED MILLING AND POEWRFUL

FULGURITE AND HIGH SPEED MILLING AND POEWRFUL

UMG-FHPS
UMG-FHP
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

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

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

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

Unit/單位: mm

切削條件表 P423-424
Cutting Condition

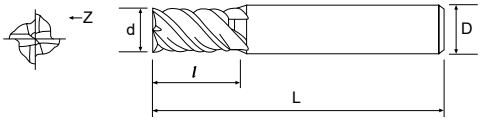
FHP Type - Short Flute - 4 flutes

■ 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/mm² Grain Size=0.4 μ m





Purchase Code 採購代碼 : FHPS020.A

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

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	45°	
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, 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	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

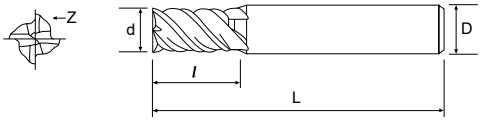
400 Nano | HRC ▶ 60 | ALTIBN

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² Grain Size=0.4 μ m





Purchase Code 採購代碼 : FHPS052.A



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	45°	
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-harden 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

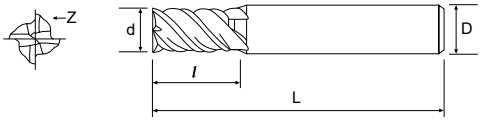
FHP Type - Short Flute - 4 flutes

■ 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/mm² Grain Size=0.4 μ m





Purchase Code 採購代碼 : FHPS020.A

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

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	45°	
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, 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	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

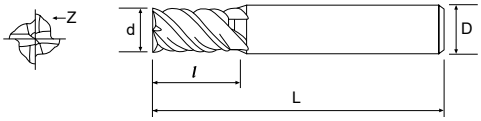
FHP Type - Short Flute - 4 flutes

■ 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^2 Grain Size=0.4 μ m





Purchase Code 採購代碼 : FHP030.A

UMG - FHP

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	45°	
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, 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	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

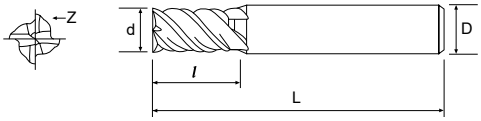
FHP Type - Medium / Long Flute - 4 flutes

■ 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/mm² Grain Size=0.4 μ m





Purchase Code 採購代碼 : FHPM030.A

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	45°	
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	45°	
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, 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	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 - Corner Radius - 4 flutes

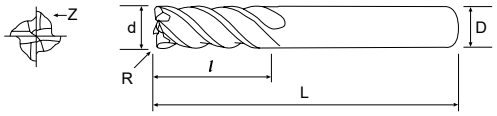
■ 4刃重切削圓鼻刀立銑刀

400 Nano | HRC ▶ 60 | ALTIBN | R

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m



Purchase Code 採購代碼 : CRFHP0302.A



UMG - CR - FHP

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	45°	
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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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)奈米氮化鉻鋁矽塗層乾式切削技術，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+ 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

Unit/單位: mm

切削條件表 P425
Cutting Condition

FHP Plus Heavy duty - Square Type - 4 flutes

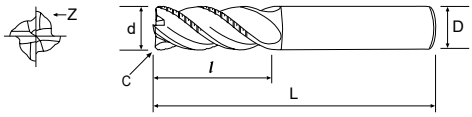
■ 加強版4刃重切削立銑刀

400 Nano | HRC ▶60 | nACRo | 45°

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm² Grain Size=0.4 μm



Purchase Code 採購代碼 : FHPC060.A



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

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	45°	A B
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	45°	A B
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	45°	A B
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, 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	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 P425
Cutting Condition

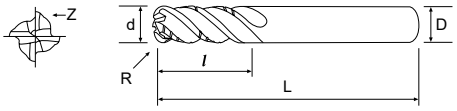
FHP Plus Heavy duty - Corner Radius Type - 4 flutes

■ 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^2 Grain Size=0.4 μ m





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	45°	A B
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

Type of machining Process 多樣加工型態例

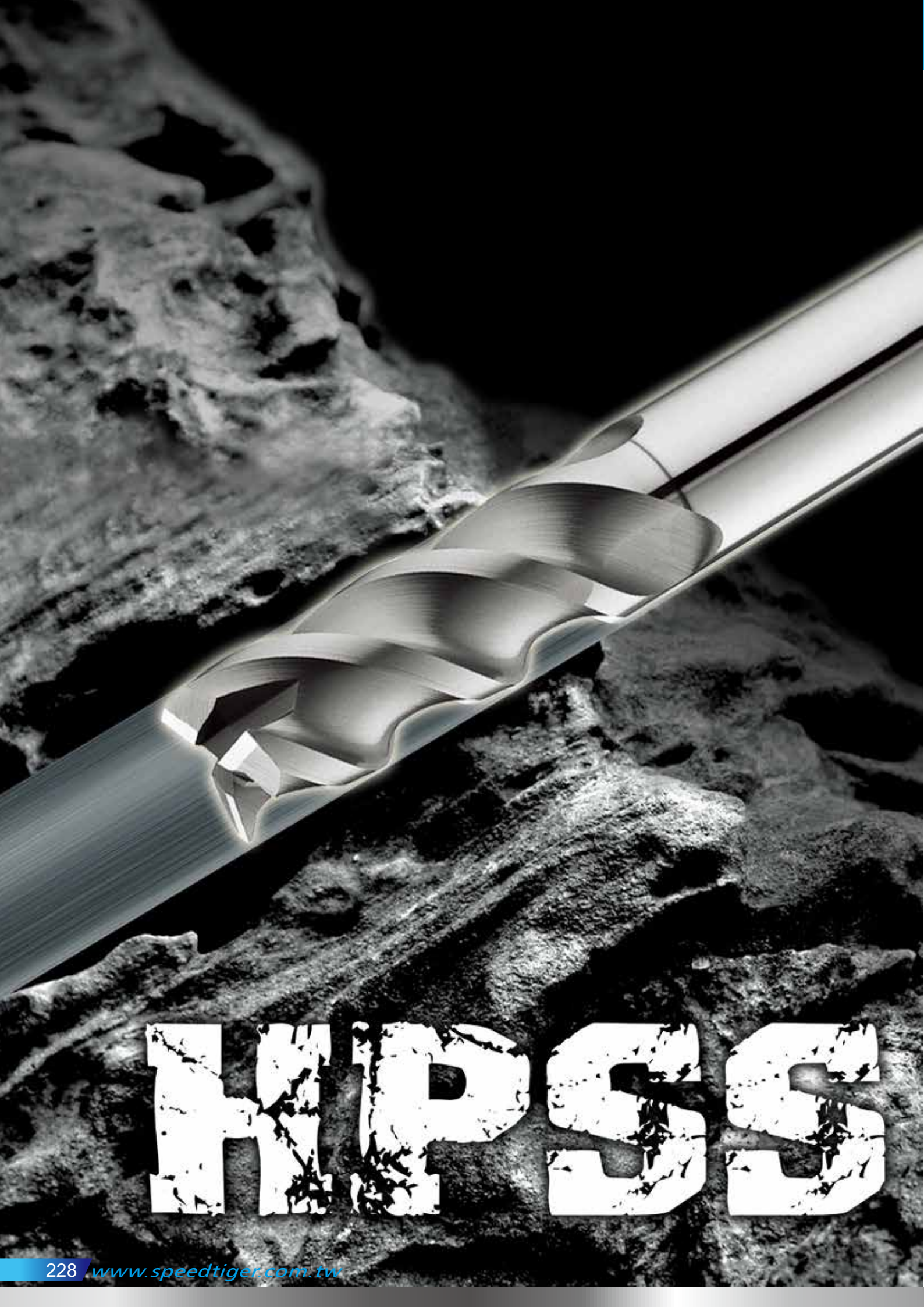


Application 適用材質 :

★ Perfect 最推薦 ◎ Excellent 適合 ○ Good 佳

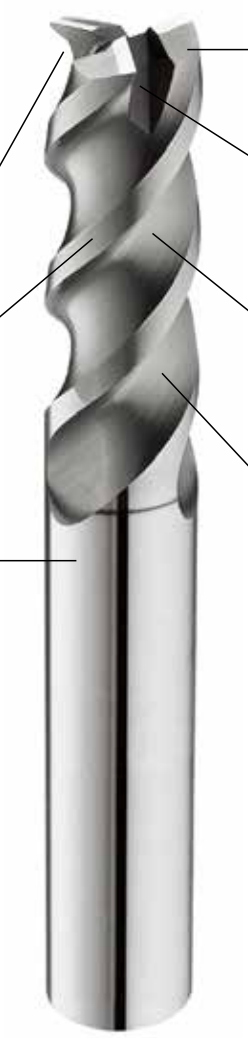
carbon steel, Alloy steel 炭素鋼 ,合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不鏽鋼	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	○	○		○	○	

Unit/單位: mm


HPSS

High Speed Pluging
High Speed Slotting
High Speed Side milling

HPSS



長壽命
Long tool life

防止角部崩損
Cutting edges designed to prevent chipping at corners

最佳設計的底刃容屑槽
Optimized chip pocket at end of cutting edge

刀徑容許公差 0 ~ -0.02mm
Tool diameter tolerance 0 ~ -0.02mm for all size

特殊排屑槽
Smooth chip flow due to high potential

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

全新複合奈米薄膜
A new SS **AlCrN** coating

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



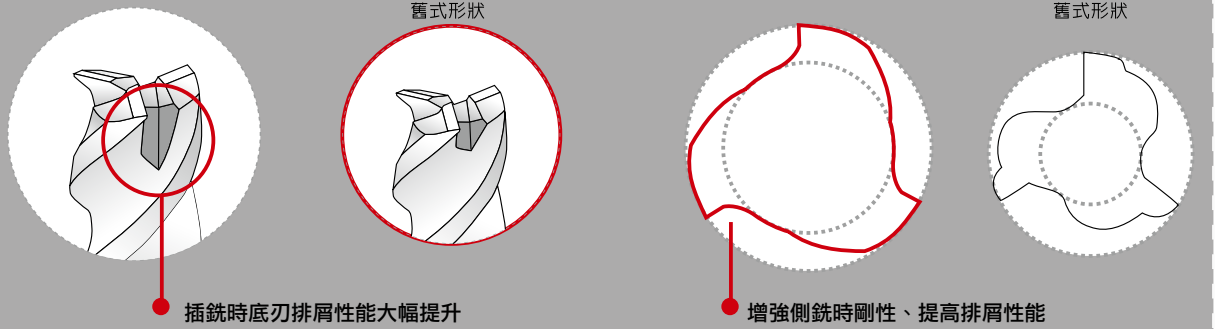
Unequal Flute Spacing
不等分割

HPSS video
切削影片

Unit/單位: mm

特點一

進化的3枚刀刃形狀



插銑時底刃排屑性能大幅提升
Improve chip removing during the sloting

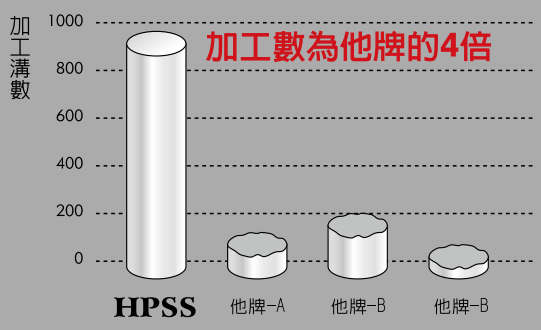
增強側銑時剛性、提高排屑性能
Advanced tool disign.Improve tools life.

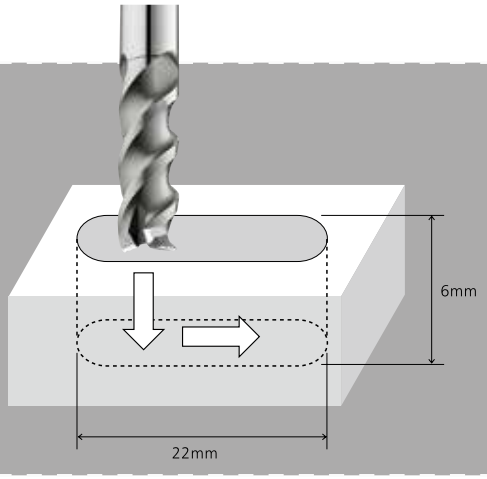
特點二

本銑刀同時具有鑽頭、插銑、溝加工、側面加工等多功能

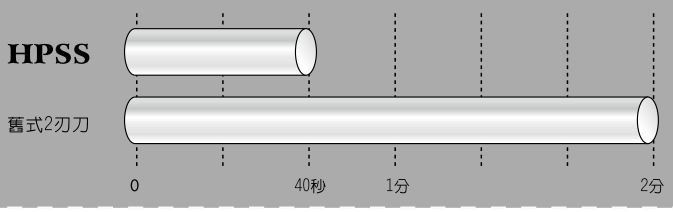
This multi-function endmill can be applied to plug, slot and side working.

溝加工範例一





溝加工範例二



加工時間大幅縮短為1/3

Unit/單位: mm

切削條件表 P426
Cutting Condition

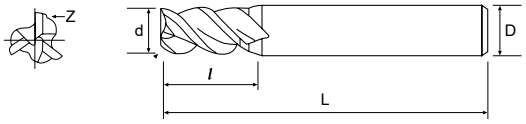
plugging+Slotting+Side milling

■ 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^2 Grain Size=0.4 μ m





Purchase Code 採購代碼 : HPSS0200.A

HPSS

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	45°	
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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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 one' s)
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，刀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) 第一外徑 (粗胚)		Scenod Diameter (Finishing) 第二外徑(精銑)
Diameter 刃　徑	Tolerance（Unit：mm） 公差（單位：mm）	Tolerance（Unit：mm） 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

Unit/單位: mm

切削條件表 P427
Cutting Condition

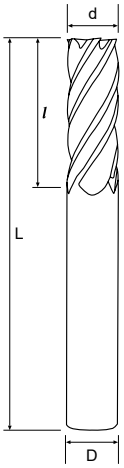
KKH Multi Flutes High Efficiency
■ 多刃高效立銑刀

200 PLUS | HRC ▶ 65 | P-nACo

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m







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, 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	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 P428
Cutting Condition

KKM Multi Flutes High Efficiency

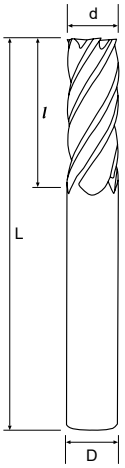
■ 多刃高效立銑刀

400 Nano | HRC ▶55 | 35° | TiSiN

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m







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, 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	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 P429
Cutting Condition

KKF Multi Flutes High Efficiency

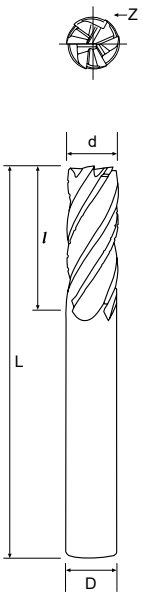
■ 多刃高效立銑刀

400 Nano | HRC ▶45 | 35° | nACRo

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m



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

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-harden 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 P430
Cutting Condition

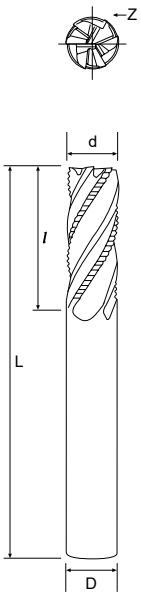
KKR Multi Flutes High Efficiency
■ 多刃高效立銑刀

400 Nano | HRC ▶45 | 35° | nACRo

- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m



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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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

Unit/單位: mm

SH Super High Hardness & Super High Speed Cutting

End Mill Series For High Performace 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 Acuracy • 尺寸變化極少，精加工最適合 Less dimensional change, It's suitable for finishing

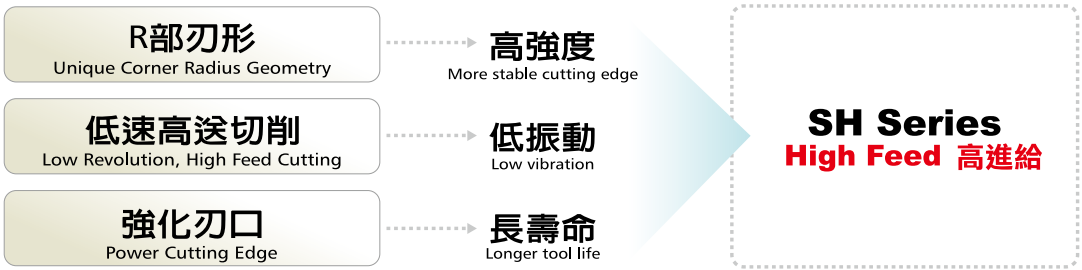
最新幾何刀刃形狀，擁有最高剛性Rx1保證，高精度R值
A new geometry is adopted to ensure rigidety and execllent R accuracy & specially cutting edge.

高能率 High Efficient • 強力重切削粗加工可行 A powerful roughing is available
高精度 High Acuracy • 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，尺寸摩耗小，高精密度精加工可行

- The tool exhibits it's power to various materials from pre-harden 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



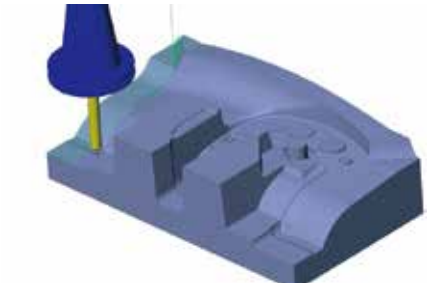
工具和模具製造業 Tool and mould manufacturing

高速加工機器
High speed machining
高剛性機器
Hard machining
乾式機器
Dry machining

增加生產力和競爭力的秘訣
Keys to productivity and competitivity

How ?

透過SH系列工具實現
Through SH tool performance



粗加工
Roughing
中加工
Semi-finishing
→ 減少人員並且免去管理
Maximum use of machines (3 x 8)
Reduced personnel without surveillance

精加工
Finishing
→ 縮短生產週期，提高生產表面品質
Cycles as short as possible
Quality of machined surface

Unit/單位: mm

切削條件表 P431
Cutting Condition

SH KTG Super High Hardness & Super High Speed Cutting Ball Nose Type

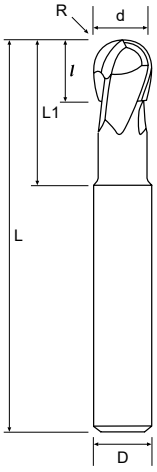
■ 超高硬度 / 超高速加工球刀

200 Nano | HRC ▶65 | 5° | SH

- Ultra Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm^2 Grain Size=0.2 μ m







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, 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	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 P432
Cutting Condition

SH Super High Speed / High Hardness

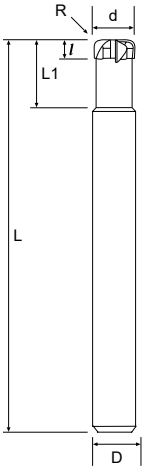
■ 超高硬度 / 超高速加工圓鼻刀

200 Nano | HRC ▶65 | 5° | SH

- Ultra Micro Grain Carbide
- WC=91 Co=9 HRA=93.2 Rupture=4000N/mm^2 Grain Size=0.2 μ m







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

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-harden 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			
○	○	◎	◎	◎	★			

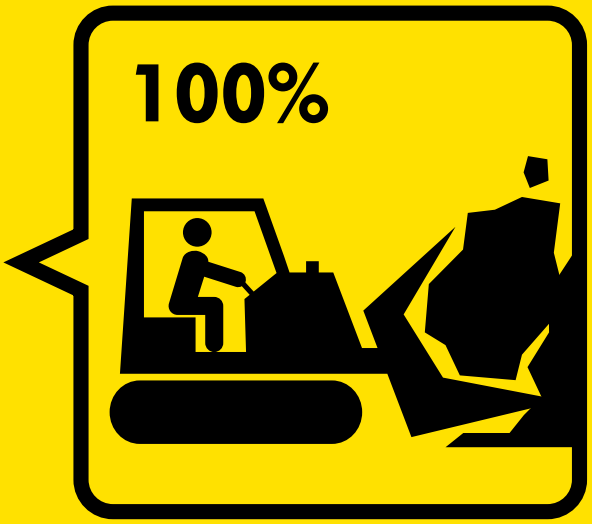
Unit/單位: mm

SAVE TIME

SPEED TIGER

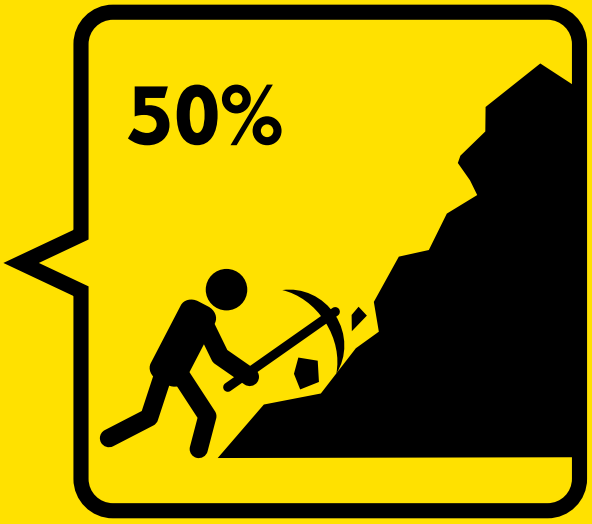
BIG FOOT RADIUS ENDMILL





BALLNOSE ENDMILL





SAVE TIME
BIG FOOT
RADIUS ENDMILL



長壽命
Long tool life

刀刃平順光滑
Smooth radiul relief

高效能
High efficient

刀徑容許公差 0 ~ -0.02mm
Tool diameter tolerance 0 ~ -0.02mm
for all size

高精度
High accuracy

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

全新氮化鋁鈦
A new SH AlTin coating

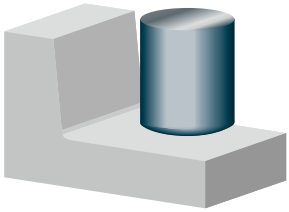
高效能、高精度加工
加工時間縮減20%~50%可行

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

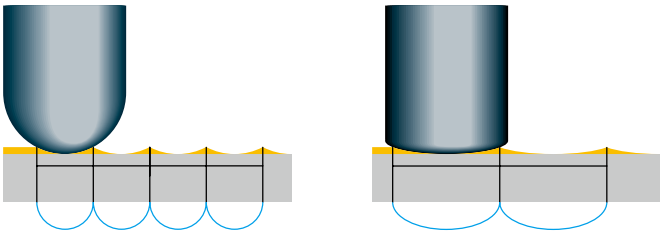
長壽命
橢圓形狀同球型銑刀加工場合
走行距離大幅縮短
形成長壽命

↘加工資訊 CUTTING DATA

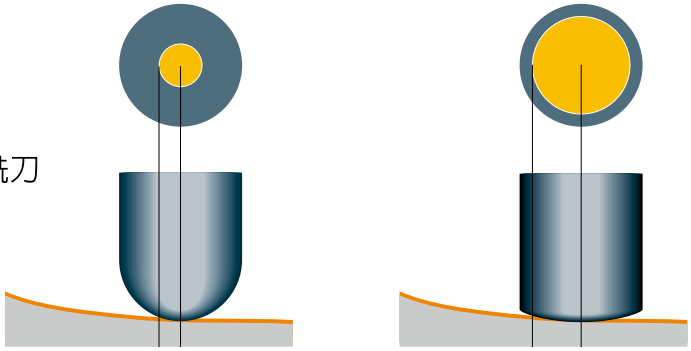
加工法-1：
加工面工具選擇效率良加工
Super smooth finished surface



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



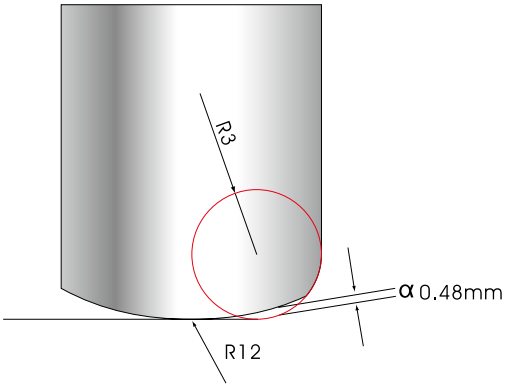
加工法-3：
高效率、低成本替代同R值球型銑刀
The efficiency is equal to
one size larger ball



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 P433
Cutting Condition

BIG FOOT Super Remover

■ BIG FOOT 高移除率球刀

400 Nano | HRC ▶60 | 30° | SH | R ±0.01

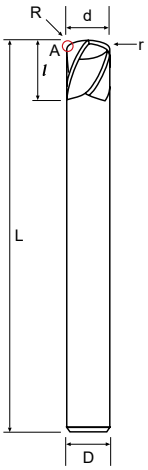
- Ultra Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m

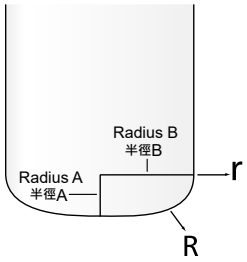


BIG FOOT

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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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衆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。



SUS Stainless Steel Expert

■ 不鏽鋼專用立銑刀

600 Nano | HRC ▶ 50 | 45° | SSA

- Ultra Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m

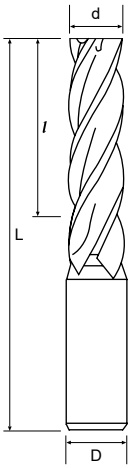


切削條件表 P336-337
Cutting Condition

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, 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	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 P434
Cutting Condition

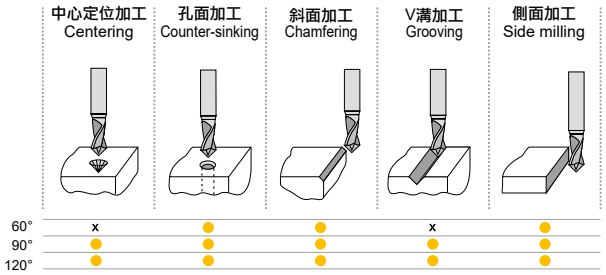
Multi - Function type - 2 flutes

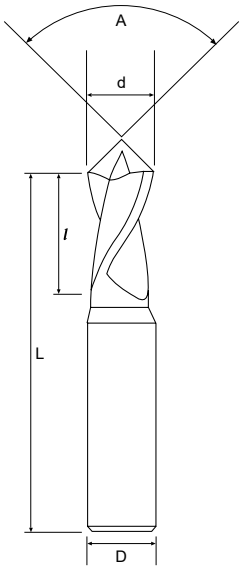
■ 2刃多功能立銑刀

600 Nano | HRC ▶ 50 | 35° | ALTIBN

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m







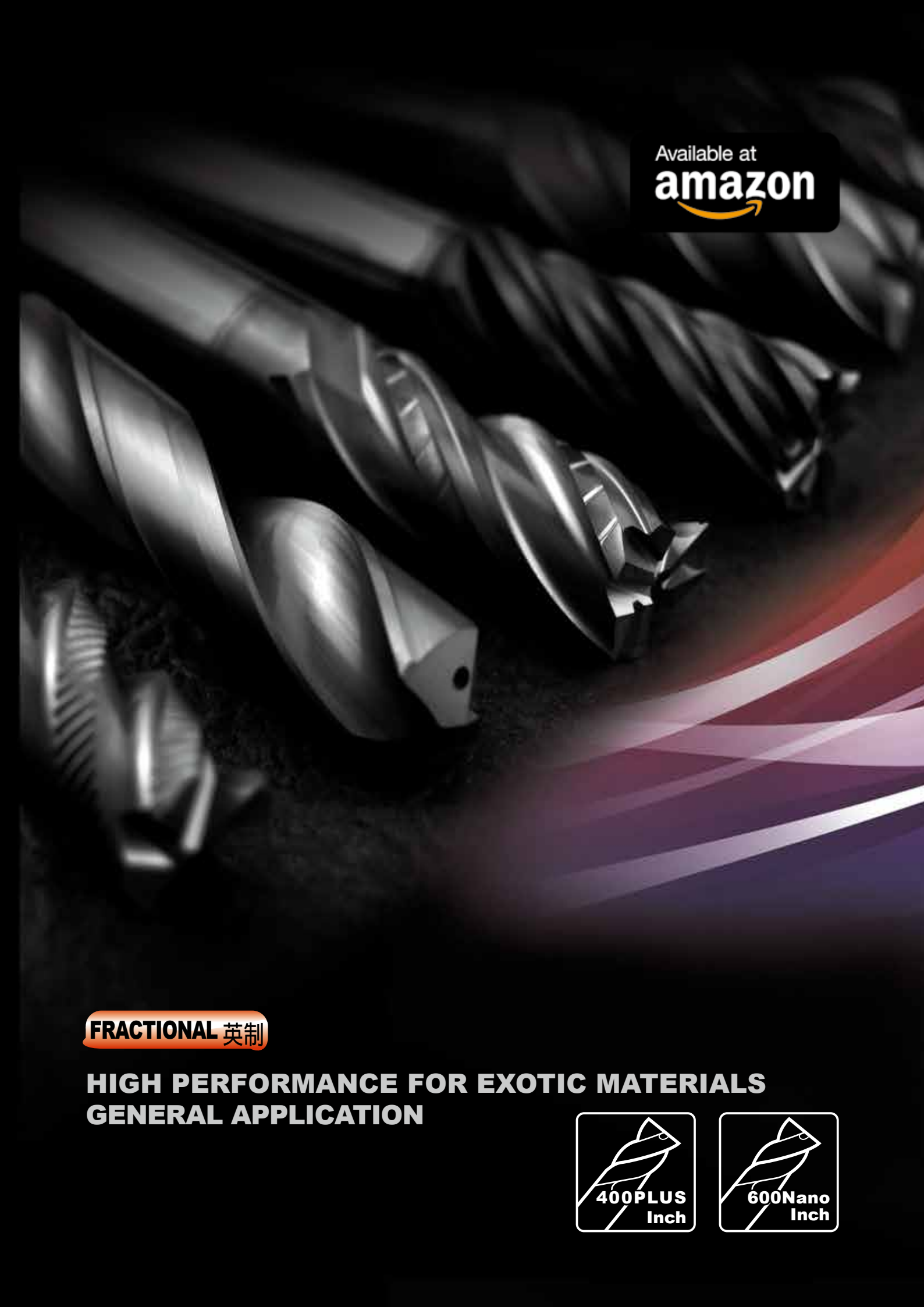
MODE	Diameter	Flute Length	Full Length	Shank Diameter	Tip Angle	Flutes
型號	d 刃徑	ℓ 刃長	L 全長	D 柄徑	A 前端角	Z 刃數
CDM060030 ALTIBN	3	6	50	4	60°	2
CDM090030 ALTIBN	3	6	50	4	90°	2
CDM120030 ALTIBN	3	6	50	4	120°	2
CDM060040 ALTIBN	4	8	50	6	60°	2
CDM090040 ALTIBN	4	8	50	6	90°	2
CDM120040 ALTIBN	4	8	50	6	120°	2
CDM060050 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, Alloy steel 炭素鋼 ,合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
○	◎	◎	○			○		

Unit/單位: mm



FRACTIONAL 英制

HIGH PERFORMANCE FOR EXOTIC MATERIALS
GENERAL APPLICATION

Cutting Condition
P435-440

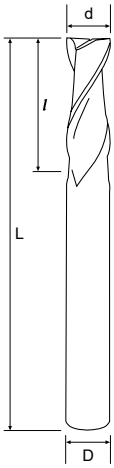
Square Type - 2 flutes
■ 2刃立銑刀

600 Nano | HRC ▶ 55 | 35° | ALTiBN

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m







FRACTIONAL 英制

MODE 型號	Diameter d 直徑	Flute Length *l* 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	○			○		

Cutting Condition
P435-440

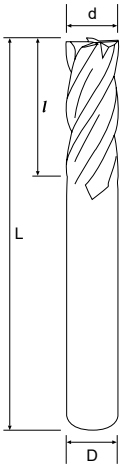
Square Type - 4 flutes
■ 4刃立銑刀

600 Nano | HRC ▶55 | 35° | ALTiBN

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m







FRACTIONAL 英制

MODE 型號	Diameter d 直徑	Flute Length l 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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

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-harden 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			
◎	◎	◎	○			○		

Cutting Condition
P435-440

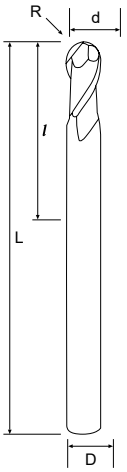
Ball Nose Type - 2 flutes
■ 2刃球型立銑刀

600 Nano | HRC ▶ 55 | 35° | ALTiBN

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m







FRACTIONAL 英制

MODE 型號	Diameter d 直徑	Flute Length *l* 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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

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-harden 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			
◎	◎	◎	○			○		

Cutting Condition
P441

Square function type- For Aluminum - 2 flutes

■ 2刃鋁合金專用立銑刀

600 Nano | 55° | ZrN

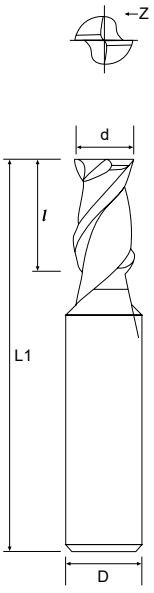
- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m



FRACTIONAL 英制

MODE 型號	Diameter d 直徑	Flute Length *l* 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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

600 Nano　50°

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6 μ m



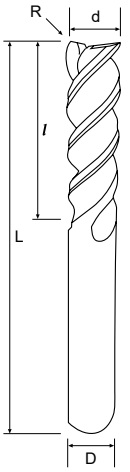
FRACTIONAL 英制

MODE 型號	Diameter d 直徑	Flute Length *l* 刃長	Full Length L 全長	Shank Diameter D 柄徑	Flutes 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



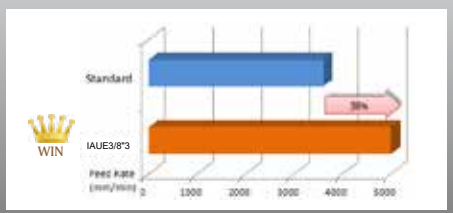


※Special U-Type design:
Material removal rate (MRR) and surface finishes are greatly improved due to effective chip removal at high rate.

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

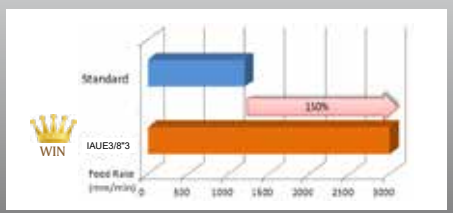
※Sharp aluminum alloy tooth design. Applicable for roughing and finishing.

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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							◎	★

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

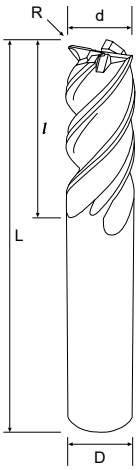
Square type - 4 flutes

■ 4刃不等立銑刀

- Ultra Fine Micro Grain Carbide
- WC=87 Co=12 HRA=92.1 Rupture=3800N/mm^2 Grain Size=0.4 μ m







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, 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	Copper alloy 銅合金,銅	Aluminum alloy 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^2 Grain Size=0.4 μ m

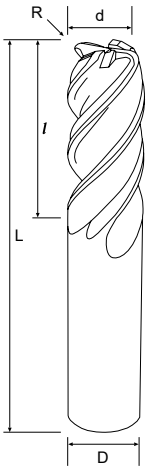


FRACTIONAL 英制

MODE 型號	Diameter	Corner Radius	Flute Length	Full Length	Shank Diameter	Flutes
	d	R 角	*l*	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, 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
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	◎			○	◎	○

Note



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嶄露頭角系列產品，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)	(Q'TY) 內含數量	ST3500	ST3500 eco
EZ BASE NO40(FIT BT40, SK40 & CAT40) (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)	(Q'TY) 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)	(Q'TY) 內含數量	ST3500	ST3500 eco
EZ ROUND TRAY 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)	(Q'TY) 內含數量	ST3500	ST3500 eco
EZ3W SHOWER HOUSE (A) EZ3W 冷卻雨淋上蓋 (A)	1.40	1PC/ 1 個	V	
EZ3W SHOWER HOUSE EXTENSION (B) 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)	(Q'TY) 內含數量	ST3500	ST3500 eco
EZ3W COOLANT LIQUID 600ML 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.
Recommand coolant liquid Castrol Syntilo 9930, and replace coolant liquid for all tank at every 6~12 months.
冷卻液 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 Syntrol 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	(Q'TY) 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	



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

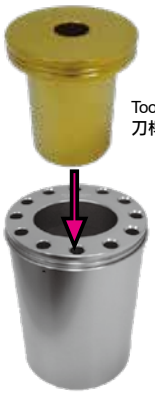
STOCK 庫存	CODE 型號		W 重量 (KG)
◎	EZ BASE NO20	(FIT ISO20 & ISO20G)	1.00
◎	EZ BASE NO25	(FIT ISO25 & ISO25G)	1.00
◎	EZ BASE NO30	(FIT BT30 & BT30G)	1.00
◎	EZ BASE NO40	(FIT BT40, SK40 & CAT40)	1.00
◎	EZ BASE NO50	(FIT BT50, SK50 & CAT50)	1.00
◎	EZ BASE H025	(FIT HSK025)	1.00
◎	EZ BASE H032	(FIT HSK032, PSC032 & 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 HSK063, PSC063 & TS063)	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

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



Toolholder Extension Base
刀桿延長桿基座

BT40 Toolholder Base
BT40 刀桿基座

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，搭配以上隔環，即可適用 BT30/BT40/HSK30/HSK40/HSK50 刀桿。



Round Tray
刀桿隔環

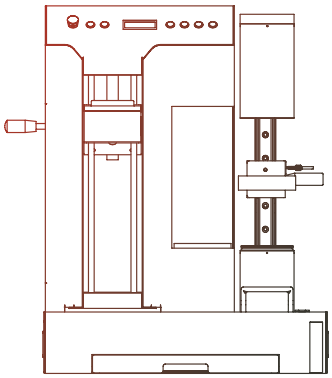
BT50 Toolholder Base
BT50 刀桿基座

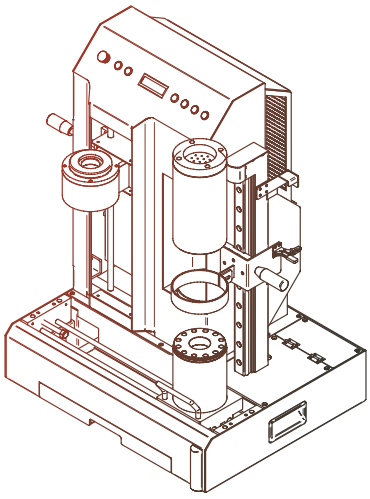
STOCK ◎ = 標準在庫品 // STOCK ◎ =regular stock



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 Mannual 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

任何形式刀桿
(油壓 / 側固 / ER / DC / SK... 等)
Chucks

各系列燒結刀桿
Shrink Fit Chucks

1. 鎢鋼抗震材質
2. 多種規格可供選擇
3. 製作過程較容易
4. 環保節能最佳選擇
5. 以燒結方式結合、提供更高精度
6. 可搭配中心出水

1. Carbide anti-vibration materials.
2. Many specifications for your option.
3. Manufacturing process becomes easier.
4. Best choice for eco-friendly.
5. Higher accuracy by sinter incorporated
6. Work with coolant is available.

燒結捨棄式刀頭
Shrink Fit Heads

1. 運用雙頭龍設計搭配燒結方式降低偏擺，提高刀具壽命
2. 低利時代，降低刀具成本
3. 多樣選擇，靈活運用

1. Reduce the run-out and improve tool life by using dual End Anti-Vibration Shrink Fit Extension.
2. Reduce the cost of cutting tools.
3. Many choices and with more flexible applications.

內冷中心孔
Internal coolant hole





雙頭龍轉接座
Adapter

1. 震虎、山謙聯名開發
(專利產品，仿冒必究)
2. 雙頭龍燒結式轉接座
讓您更靈活運用與加工

1. Speed Tiger and YAMAKEN co-branded developed. (Patent Product, All Rights Reserved.)
2. More flexible application by using the adapter of Dual End Anti-Vibration Shrink Fit Extension.







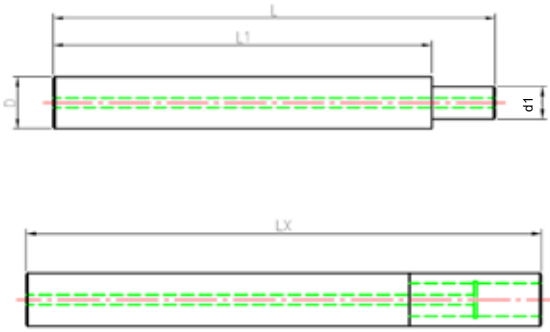
嶄露頭角全系列刀具
Power Tips

中心出水鑽頭
Drills/Coolant Drills

各式鎢鋼材質刀具
Carbide End Mills

Dual End Carbide Anti-Vibration Shrink Fit Extension

■ 雙頭龍鎢鋼抗震延長桿



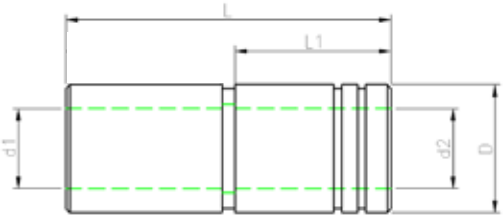


MODE	Shank Diameter	d1 Front Diameter	Shank Length	Full Length	Length of Combination
型號	D 柄徑	d1 前端柄徑	L1 柄長	L 總長	LX 組合總長
S1006-L120	10	6	87	103	120
S1006-L160			127	143	160
S1006-L200			167	183	200
S1006-L300			267	283	300
S1208-L120	12	8	85	102	120
S1208-L160			125	142	160
S1208-L200			165	182	200
S1208-L300			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

Unit/單位: mm

Adapter

■ 雙頭龍轉接座





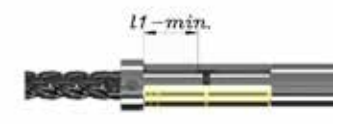
材質 : SKD 鋼材
Material: SKD Steel

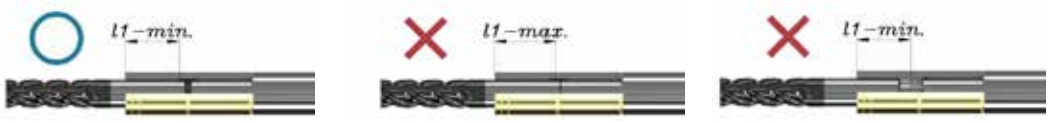
MODE	Diameter	d1 Diameter	d2 Diameter	L1 Shrink Length 刀具燒結長度		Full Length
型號	D 外徑	d1 刀桿端孔徑	d2 刀具端孔徑	Min.最短燒結長度	Max. 最長燒結長度	L 總長
SD10-EZ06-EZ04-033	10	6	4	14	16	33
SD10-EZ06-EZ06-033			6	14		
SD12-EZ08-EZ04-035	12	8	4	14	17	35
SD12-EZ08-EZ06-035			6	15		
SD12-EZ08-EZ08-035			8	16		
SD16-EZ10-EZ06-041	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。
可使用刀刃固定器，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





Unit/單位: mm

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 Order No.品號D07250110101	3.8	25	120	29	20

Unit: mm

Unit/單位: mm



Insert Price End Mill Function & Performance

Power Tips

Replaceable End Mills Head

可替換刀頭立銑刀

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

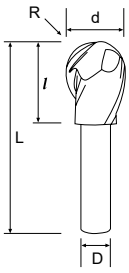
SBS Ball Nose Tip - 2 & 4 flutes

■ 球形刀頭2刃/4刃

600 Nano | HRC ▶ 50 | 35° | nACRo





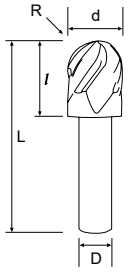


2 Flutes - 2 刃

MODE	Diameter	Radius	Flute Length	Full Length	Shank Diameter	Flutes
型號	d 刃徑	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 刃徑	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, 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	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	○	○				

Unit/單位: mm

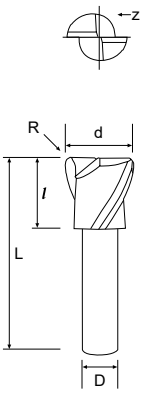
RTAS 2 刃 切削條件表 P450 Cutting Condition

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

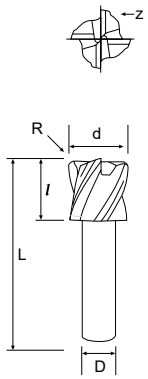




2 Flutes - 2 刃

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
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 刃徑	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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	○	○				

Unit/單位: mm

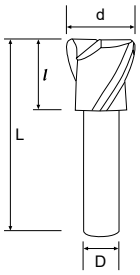
切削條件表 P452
Cutting Condition

SES Square Tip - 2 & 4 flutes

■ 平刀頭 2 刃 /4 刃





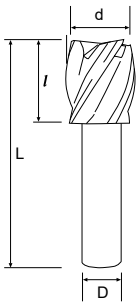


2 Flutes - 2 刃

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
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 刃徑	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, 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	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 P453
Cutting Condition

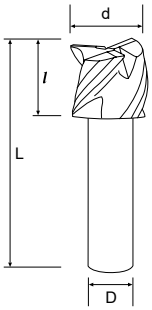
PES Square Tip - 3 flutes

■ 平刀頭 3 刃 45°



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





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-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	○	○					

Unit/單位: mm

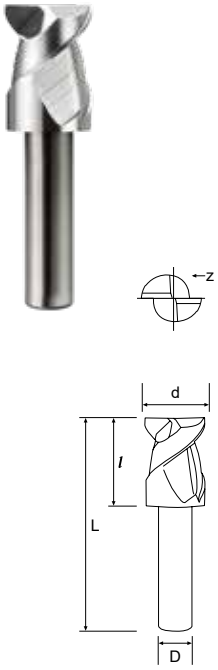
AES5 2 刃 切削條件表 P454 Cutting Condition

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°



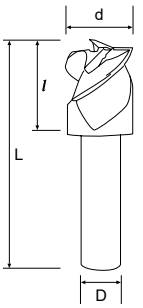
2 Flutes - 2 刃

MODE	Diameter	Flute Length	Full Length	Shank Diameter	Flutes
型號	d 刃徑	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 刃徑	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, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
							◎	◎

Unit/單位: mm

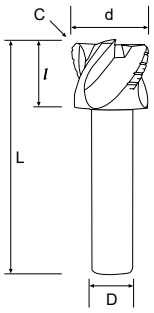
切削條件表 P456-457
Cutting Condition

FHPCS Heavy-duty - 4 flutes

■ 重切削平刀頭 4 刃







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, Alloy steel 炭素鋼，合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	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 P458-460
Cutting Condition

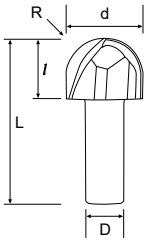
KTGS Ball Nose Tip - Super high & hardness - 2 flutes

■ 超高速、超高硬度切削球形刀頭 2 刃



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

Unit/單位: mm

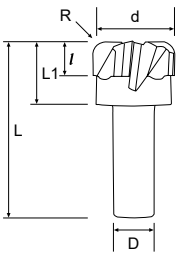
切削條件表 P461-462
Cutting Condition

KCRS Corner Radius Tip - Super high speed & high hardness - 4 flute

■ 超高速、超高硬度切削圓鼻刀頭 4 刃







佩佩用	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
最新幾何刃刃形狀，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, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	◎	◎	○				

Unit/單位: mm

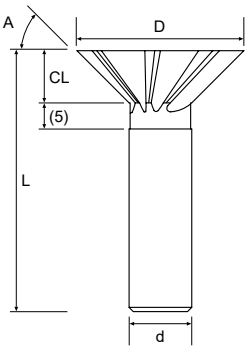
Dovetail Cutter

■ 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, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	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 P467
Cutting Condition

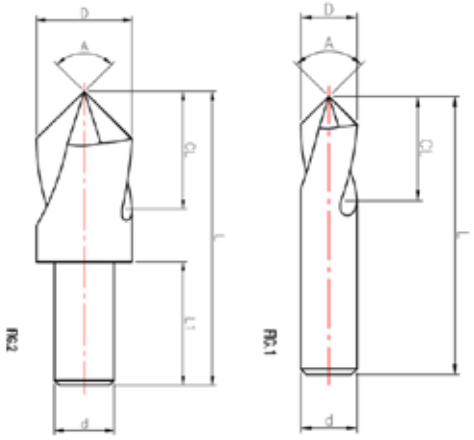
Position Chamfer Cutter

■ 定位倒角刀



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

Unit/單位: mm

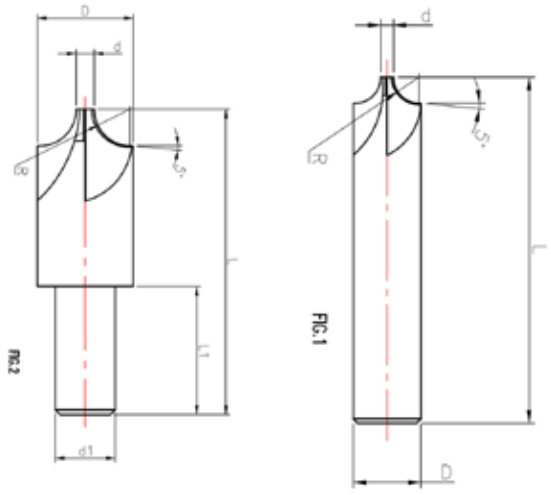
Corner Rounding Cutter

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

Unit/單位: mm

Double Chamfer Cutter

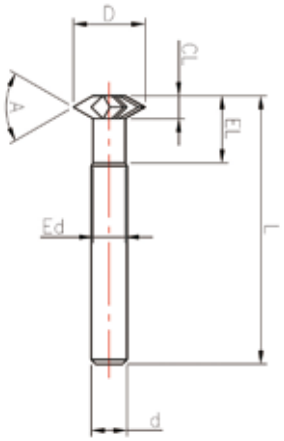
■ 雙面倒角刀



MODE	Diameter	Angle	Cutting Length	Efficient Diameter	Efficient Length	Shank Diameter	Full Length	Flutes
型號	D 刃徑	A 角度	CL 刃長	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

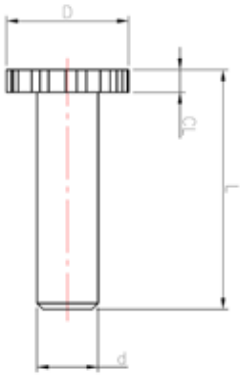
carbon steel, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	○				○	○	○

Unit/單位: mm

Keyseat Cutter

■ 鍵槽刀





MODE 型號	Diameter D 刃徑	Cutting Length CL 刃長	Length after Shrink 燒結後伸出長	Shank Diameter d 柄徑	Full Length L 全長	Flutes 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

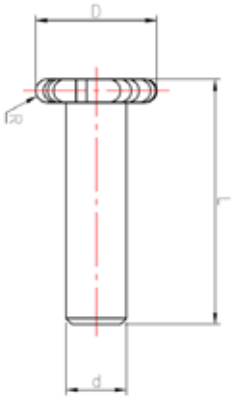
carbon steel, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	○				○	○	○

Unit/單位: mm

Keyseat Cutter - Full Radius

■ T 型 R 刀





MODE 型號	Diameter D 刃徑	Corner Radius R值	Length after Shrink 燒結後伸出長	Shank Diameter d 柄徑	Full Length L 全長	Flutes 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, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
◎	◎	○				○	○	○

Unit/單位: mm

220° Ball Nose Cutter

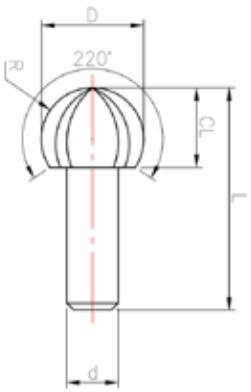
■ 220° 球刀



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

Unit/單位: mm



SPEED TIGER

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

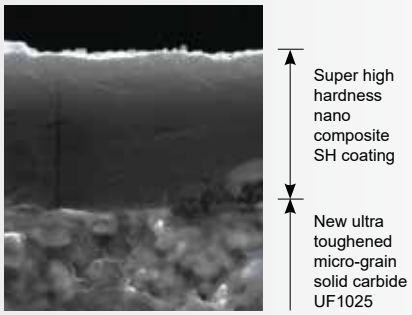


Easy cutt strengthened shape
強化快削型



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。



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

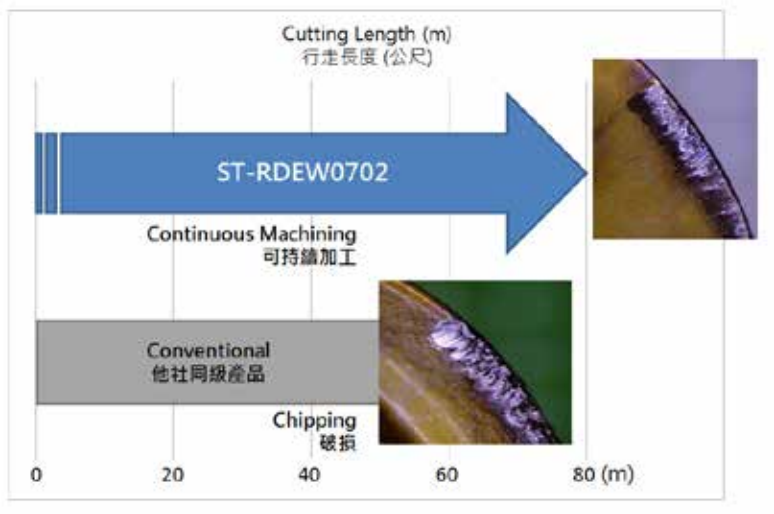
All DLC coatings are not equal：especially on Hardness and Oxidation
各種類鑽膜都有不同的特性，尤其是硬度和氧化溫度

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綱重切削，刀具壽命提升達 **60%**

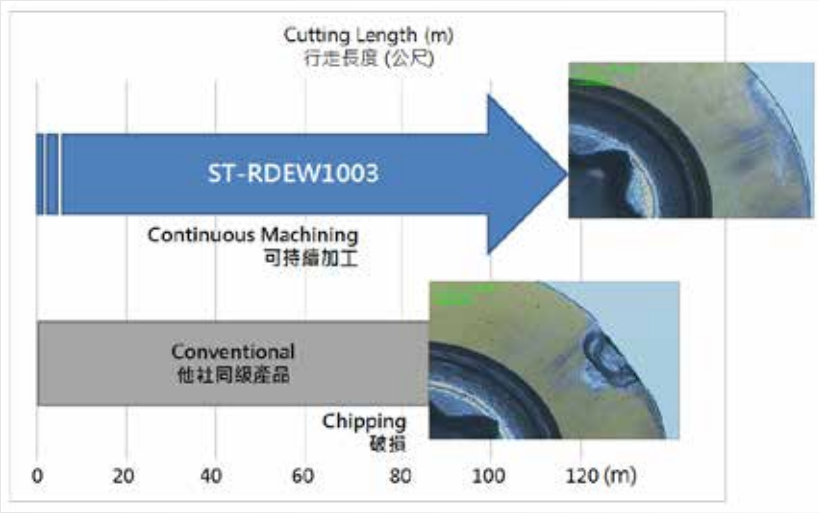
Cutting Conditions 切削條件	
Work material 工件： S45C	fz 每刃進給： 0.3mm/rev
Holder 刀架： RD072 D203 S20-150	Feed 進給速度： 2500mm/min
Insert 刀片： RDEW0702	Ap：1 mm Ae：4 mm
Vc 切削速度： 176m/min	Speed 轉速： 2800rpm



■ 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綱重切削，刀具壽命提升達 **35%**

Cutting Conditions 切削條件	
Work material 工件： SUS316	fz 每刃進給： 0.17mm/rev
Holder 刀架： RD103 D202 S20-150	Feed 進給速度： 1050mm/min
Insert 刀片： RDEW1003	Ap：1 mm Ae：4 mm
Vc 切削速度： 129 m/min	Speed 轉速： 2050rpm



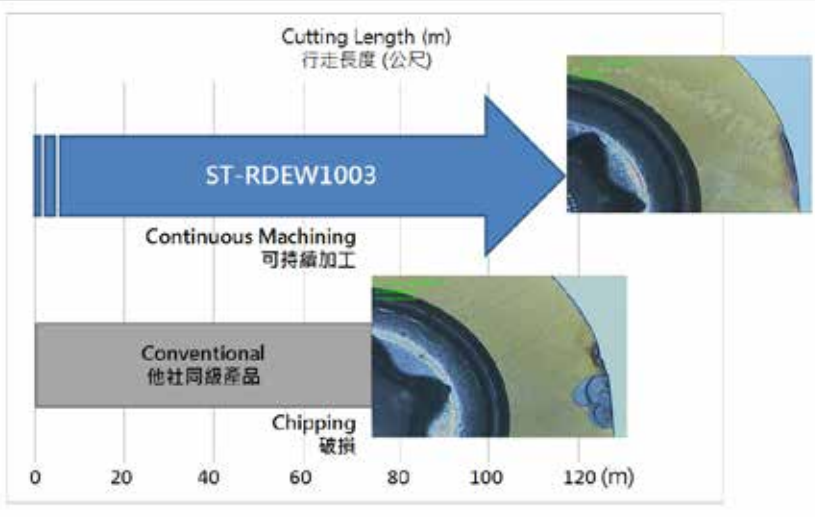
Cutting Performance
■ 切削效能

■ 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%**

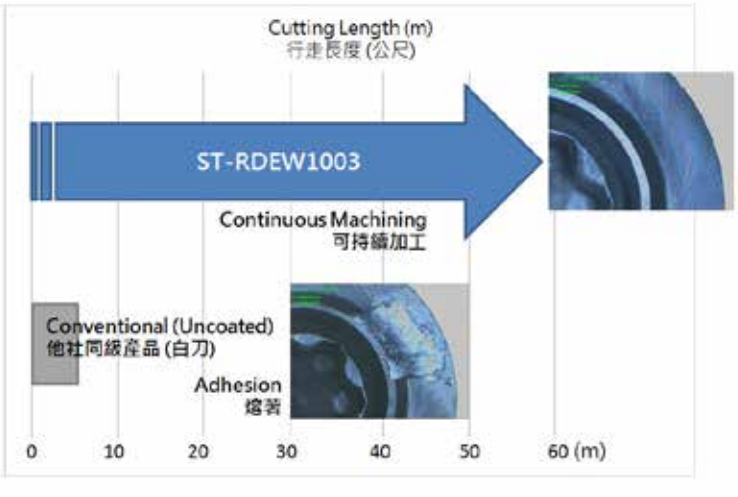
Cutting Conditions 切削條件	
Work material 工件： Pre-Hardened SKD61 (HRC55)	fz 每刃進給： 0.1mm/rev
Holder 刀架： RD103 D202-S20-150	Feed 進給速度： 450mm/min
Insert 刀片： RDEW1003	Ap：0.2 mm Ae：3 mm
Vc 切削速度： 94.3m/min	Speed 轉速： 1500



■ 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： AL6061	fz 每刃進給： 0.25mm/rev
Holder 刀架： RD072 D203 S20-150	Feed 進給速度： 3000mm/min
Insert 刀片： RDHX0702	Ap：1.0 mm Ae：12.0 mm
Vc 切削速度： 220m/min	Speed 轉速： 3342

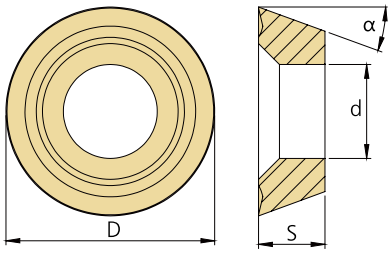


切削條件表 P463
Cutting Condition

Indexable Radius End Mill

■ 可轉位式圓鼻銑刀

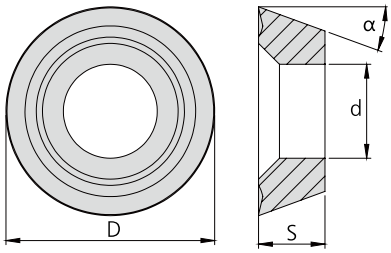
INSERTS 刀片



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	α		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



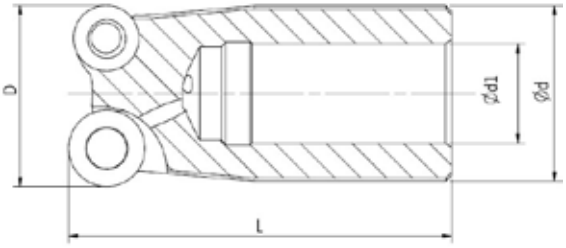
Shape 外觀	Order No. 品號	Item code 規格碼	Dimensions(mm) 規格				Coating 塗層	Available Tools 適用刀架		N
			D	S	d	α		Shank Type 直柄式 Page	Shrink Fit Type 燒結式 Page	
	JFRD2002-b	RDHX0702EF-0225	7	2.33	2.75	15°	No	290,291	289	●
	JFRD2003-b	RDHX1003EF-0225	10	3.12	4.5	15°	No			
	JFRD2004-b	RDHX0802EF-0225	8	2.32	3.4	15°	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			
	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

Unit/單位: mm

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



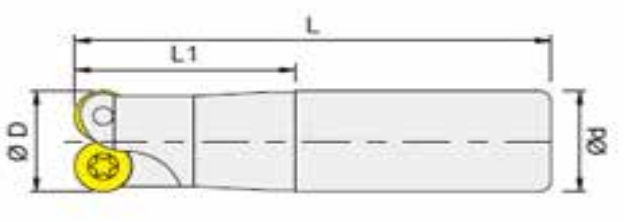
Unit/單位: mm

Radius End Mill Holder

■ RD 捨棄式整體刀柄







Item code 品名	Dimensions(mm) 規格				Teeth 刃數	Available Insert 適用刀片	Page 頁碼
	D	d	L	L1			
RD051-D122-S12-100	12	12	100	22	2	RDEW0501	288
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	RDEW0702	
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		
RD072-D213-S20-200			200				
RD072-D254-S25-150	25	25	150	40	4		
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 品名	Dimensions(mm) 規格				Teeth 刃數	Available Insert 適用刀片	Page 頁碼
	D	d	L	L1			
RD072-D355-S32-150	35	32	150	30	5	RDEW0702	288
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	RDEW1003	
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		
RD103-D263-S25-200			200				
RD103-D263-S25-250			250				
RD103-D303-S25-150	30	25	150	25	3		
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

Unit/單位: mm

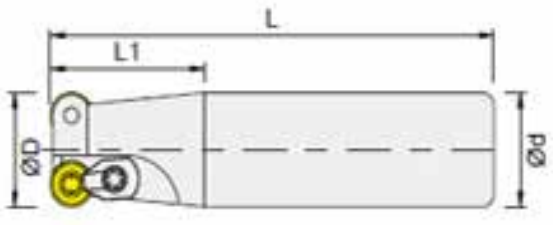
Radius End Mill Holder

■ RD 捨棄式整體刀柄

EASY-CUT SHANK TYPE 直柄快削式







Item code 品名	Dimensions(mm) 規格				Teeth 刃數	Available Insert 適用刀片	Page 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	20	20	150	40	2		
C20-4R20-200			200				
C20-4R21-150	21	20	150	25	2		
C20-4R21-200			200				
C25-5R25-150	25	25	150	45	2	RDEX10T3	
C25-5R25-200			200				
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

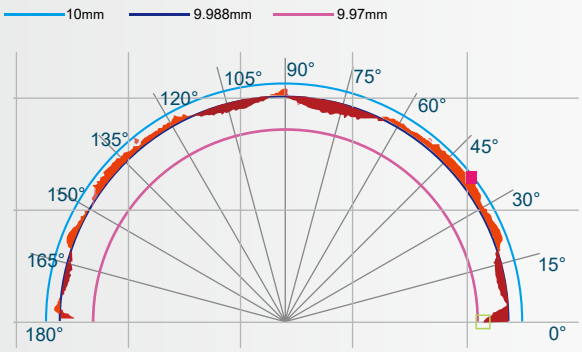
Ball-nose Insert

■ 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



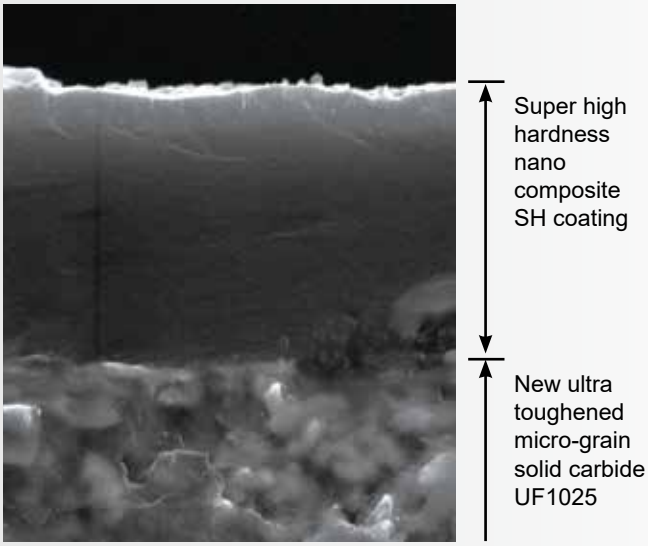
S-Shaped design for lowering cutting resistance
S 球頭低切削阻力設計

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。



Ball-nose Insert

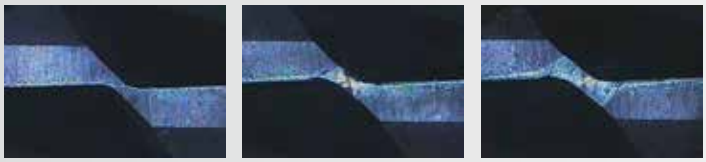
■ 高效捨棄式球刀片

■ Cutting Performance 切削效能

WRHS0162-Hardened steel milling
預硬鋼切削 SKD61-HRC55°

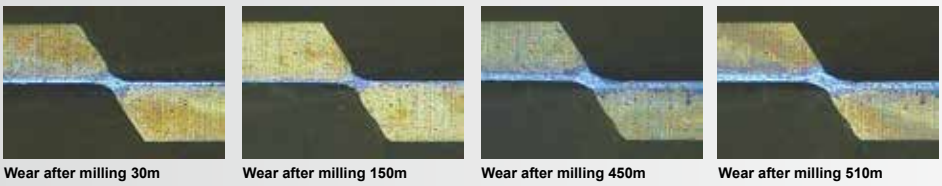
Excellent wear resistance when machining high hardness materials, and the tool life is prolonged by 20% than the conventional.

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





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

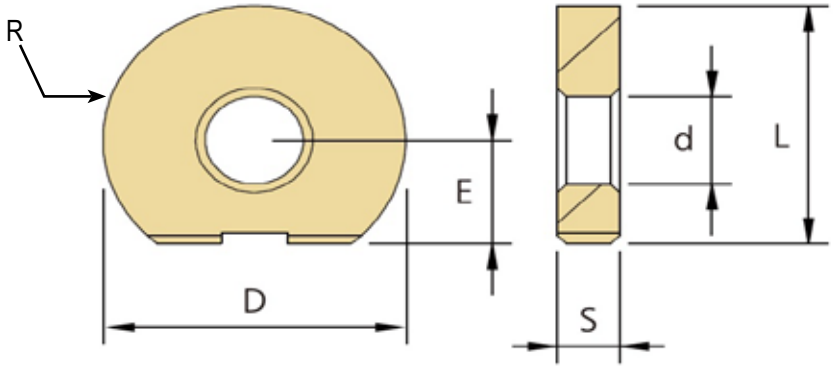
切削條件表 P464
Cutting Condition

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 外觀	Order No. 品號	Item code 規格碼	Dimensions(mm)規格						Holder 刀架	Coating 塗層	Shank Type 直柄式 Page	Shrink Fit Type 燒結式 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：

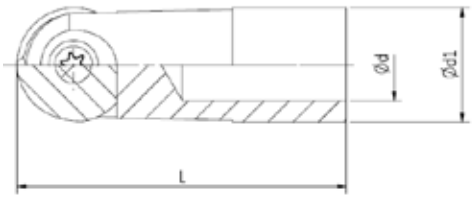
◎ Recommend 最適合 ○ Suitable 適 合 X Not Recommend 不建議

Carbon steel, Alloy steel 炭素鋼 , 合金鋼	Pre-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不銹鋼	Copper alloy 銅合金 , 銅	Aluminum alloy 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



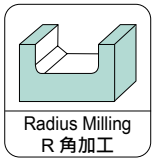
Unit/單位: mm

Ball-nose Insert Holder

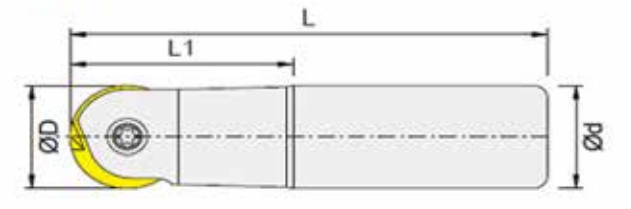
■ WR 捨棄式整體刀柄

WGR SHANK TYPE 直柄式









Item code 品名	Dimensions(mm) 規格				Teeth 刃數	Insert 刀片	Page 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

Unit/單位: mm

SPEED TIGER



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℃
  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

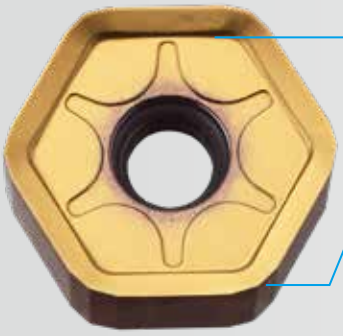
video 切削影片

HN Indexable Insert

■ 雙面六角銑刀片

■ Feature 特色

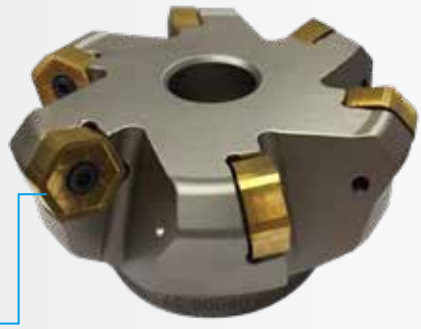
Design 外型設計



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℃ , which is suitable for milling cast iron, carbon steel, stainless steel, and alloy steel.
nACro 具有高達 1100℃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

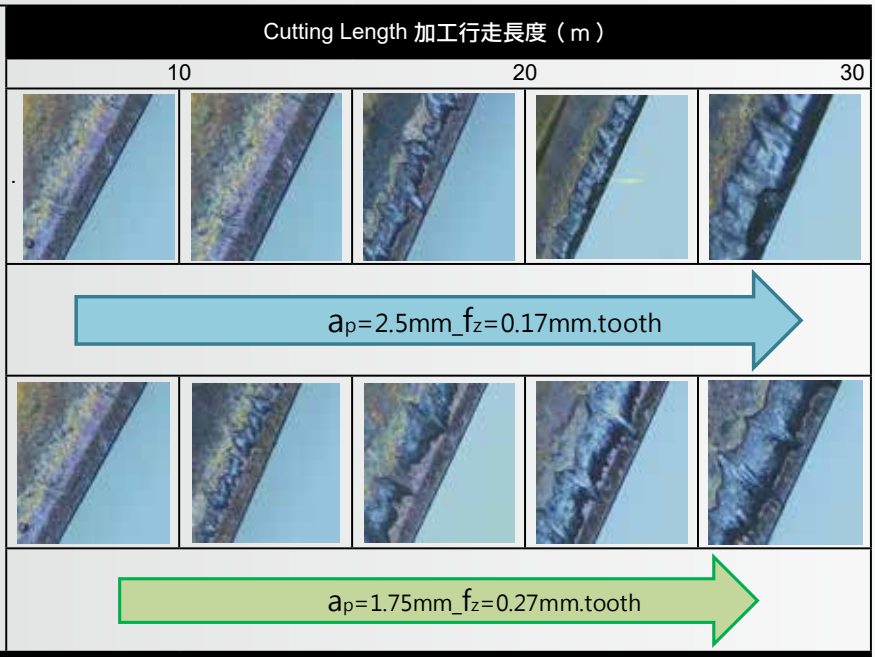
Tool Material 材料型號	ISO Standard Code ISO 標準代號	Cutting Material 材料種類	Applications 應用範圍	P 鋼 Steel	M 不鏽鋼 Stainless	K 鑄鐵 Cast Iron	N 非鐵金屬 Non-ferrous	S 耐熱鈾鋼 Heat resistant	H 硬質材料 Hard Alloy
3225	P	Cemented Carbide 超硬質合金		●					▲
	M				▲				
	K					●			
4225	P	Super Hard Alloy 超硬質合金		●					▲
	M				▲				
	K					●			
3220	P	Super Hard Alloy 超硬質合金		●					
	M				●			▲	
	K					▲			
4220	P	Super Hard Alloy 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 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

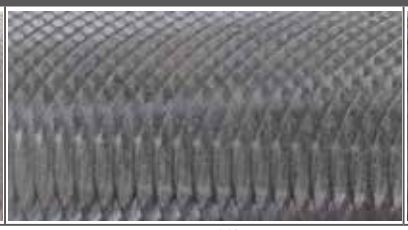
Formula 公式　Vc = πDN/1000　F = fz ・ T ・ N

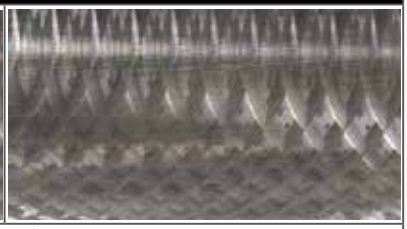
Surface Performance

■ 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=1.22μm	Ra=1.66μm	Ra=1.82μm

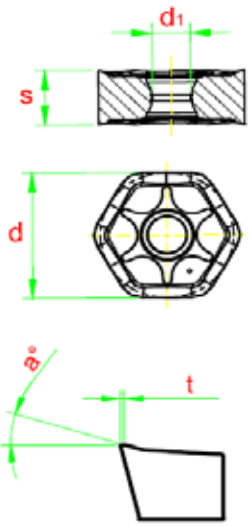
Stainless Steel 不鏽鋼 - SUS304		
		
Holder 刀具 - PHN06-5006(Ø50mm x 145mm x 6T)		
Insert 刀片 - HNGX0604-R-3225		
Vc=120m/min		
N=764rpm		
Fz=0.1mm/tooth	Fz=0.3mm/tooth	Fz=0.5mm/tooth
Ra=1.19μm	Ra=1.51μm	Ra=1.85μm

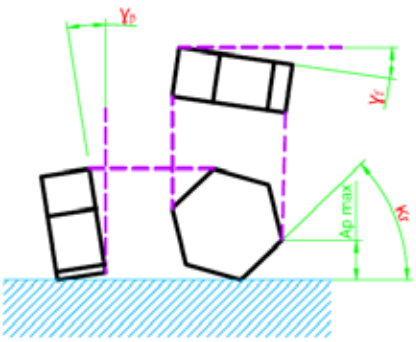
Nodular Cast Iron/Ductile Iron 球墨鑄鐵		
		
Holder 刀具 -PHN06-5006(Ø50mm x 145mm x 6T)		
Insert 刀片 - HNGX0604-R-3225		
Vc=200m/min		
N=1270rpm		
Fz=0.1mm/tooth	Fz=0.3mm/tooth	Fz=0.5mm/tooth
Ra=1.38μm	Ra=1.90μm	Ra=2.85μm

切削條件表 P465
Cutting Condition

HN Indexable Insert

■ HN 雙面六角銑刀







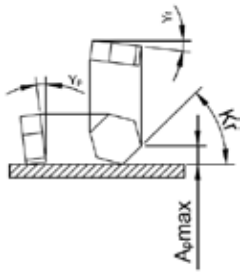
Shape 外觀	Item Code 規格碼	Dimensions (mm) 規格					Coating 塗層		Radius R 值	Milling 銑削	P	M	K
		d	d1	s	a	t	nACro	SH					
	HNGX0604-R-3225	10.5	3.64	5.26	15	0.08		✓	R0.6	Roughing 粗銑	●	▲	●
										Medium 中	●	▲	●
										Finishing 精銑	●	▲	●
	HNGX0604-R-4225	10.5	3.64	5.26	15	0.08	✓			Roughing 粗銑	●	●	▲
										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

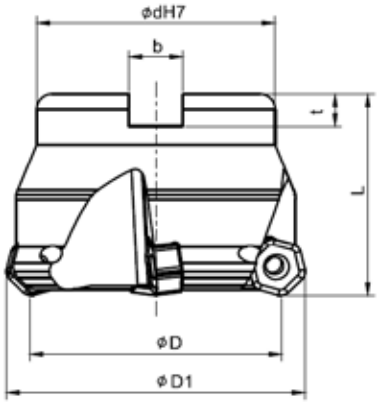
Unit/單位: mm

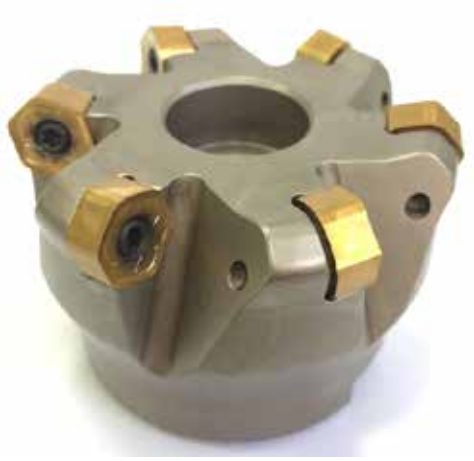
HN06 Holder

■ HN06 捨棄式整體刀柄



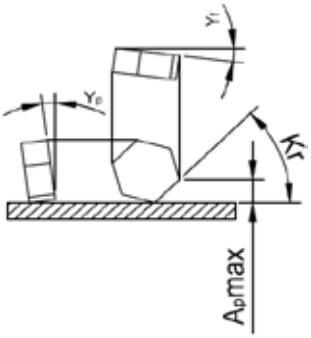
Apmax	3mm
γp	7°
γf	7°
Kr	45°

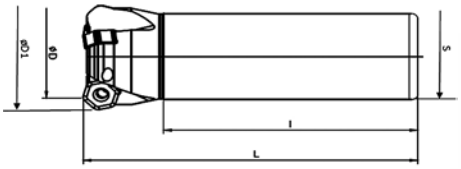




Shell Type Milling Cutter 殼型面銑刀

Item Code 規格碼	Dimensions (mm) 規格							Available Tools 適用工具		
	D	dh7	L	D1	b	t	齒數T*	Insert 刀片	Screw 星形螺絲	Screwdriver 旗形板手
PHN06-4005-C16	40	16	40	47.3	8.4	5.6	5	HNGX0604-R	M3x7.9x4.4xT10 (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			





Apmax	3mm
γp	7°
γf	7°
Kr	45°



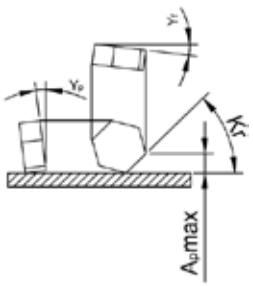
Holder 刀桿式六角銑刀

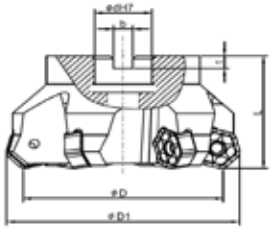
Item Code 規格碼	Dimensions (mm) 規格						Available Tools 適用工具		
	D	D1	L	l	S	齒數T*	Insert 刀片	Screw 星形螺絲	Screwdriver 旗形板手
HHN06-2502-S25-150	25	32.2	150	100	25	2	HNGX0604-R	M3x7.9x4.4xT10 (D07160100119)	T10
HHN06-2503-S25-150	25	32.2	150	100	25	3			
HHN06-3203-S32-150	32	39.3	150	100	32	3			
HHN06-3204-S32-150	32	39.3	150	100	32	4			

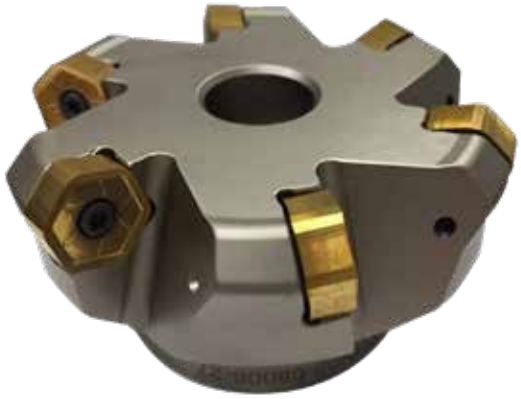
Unit/單位: mm

HN09 Holder

■ HN09 捨棄式整體刀柄







Apmax	5mm
γp	7°
γf	7°
Kr	45°

Shell Type Milling Cutter 殼型面銑刀

Item Code 規格碼	Dimensions (mm) 規格							Available Tools 適用工具		
	dh7	D	D1	L	b	t	齒數T*	Insert 刀片	Screw 星形螺絲	Screwdriver 旗形板手
PHN09-5004-C22	22	50	61.7	40	10.4	6.3	4	HNGX 0906-R	M4.x11.2x5.7xT15 (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			

Unit/單位: mm

SPEED TIGER

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℃
  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

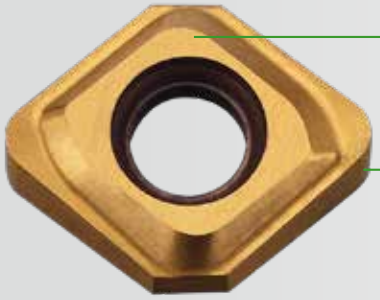
video 切削影片

CN Indexable Insert

■ CN 雙面銑刀片

■ Feature 特色

Design 外型設計

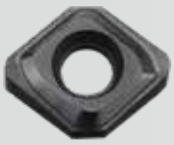


High accuracy insert which is suitable for middle finishing and finishing.
高精度刀片適用於中、精銑。

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℃ , which is suitable for milling cast iron, carbon steel, stainless steel, and alloy steel.
nACro 具有高達 1100℃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 材料型號	ISO Standard Code ISO 標準代號	Cutting Material 材料種類	Applications 應用範圍	P 鋼 Steel	M 不鏽鋼 Stainless	K 鑄鐵 Cast Iron	N 非鐵金屬 Non-ferrous	S 耐熱合金鋼 Heat resistant	H 硬質材料 Hard Alloy
3225	P	Super Hard Alloy 超硬質合金		●					▲
	M				▲				
	K					●			
4225	P	Super Hard Alloy 超硬質合金		●					▲
	M				▲				
	K					●			
3220	P	Super Hard Alloy 超硬質合金		●					
	M				●			▲	
	K					▲			
4220	P	Super Hard Alloy 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	Fz=0.2mm/tooth	Fz=0.3mm/tooth
Ra=0.45 μ m	Ra=1.01 μ m	Ra=2.06 μ m

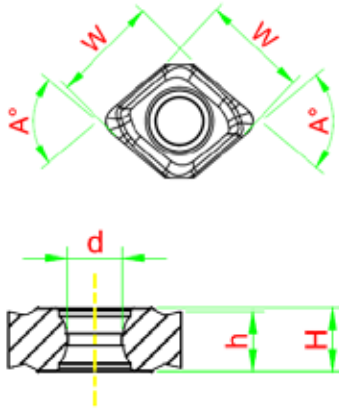
Stainless Steel 不鏽鋼 - SUS304		
		
Holder 刀具 : HCN07-D1602-S16-150		
Insert 刀片 : CNGX07-3225		
Vc=100m/min		
N=1990rpm		
Fz=0.05mm/tooth	Fz=0.2mm/tooth	Fz=0.3mm/tooth
Ra=0.38 μ m	Ra=0.52 μ m	Ra=1.38 μ m

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	Fz=0.2mm/tooth	Fz=0.3mm/tooth
Ra=0.81 μ m	Ra=1.09 μ m	Ra=1.30 μ m

切削條件表 P466
Cutting Condition

CN Indexable Insert

■ CN 雙面菱形銑刀





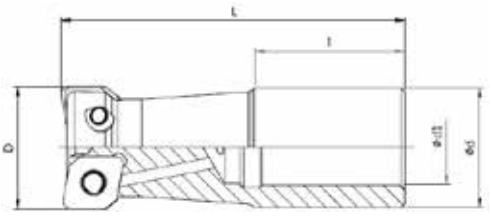
Shape 外觀	Item Code 規格碼	Dimensions (mm) 規格							Coating 塗層		Radius R 值	Milling 銑削	P	M	K
		W	d	h	H	A	a	t	nACro	SH					
	CNGX07-3225	7	3.1	3.41	3.6	80	15	0.02 ~0.03		✓	R1	Roughing 粗銑			
												Medium 中	●	▲	●
												Finishing 精銑	●	▲	●
	CNGX07-4225	7	3.1	3.41	3.6	80	15	0.02 ~0.03	✓			Roughing 粗銑			
												Medium 中	●	●	●
												Finishing 精銑	●	●	●
	CNGX07-3220	7	3.1	3.41	3.6	80	15	0.02 ~0.03		✓		Roughing 粗銑			
												Medium 中	●	▲	▲
												Finishing 精銑	●	▲	●
	CNGX07-4220	7	3.1	3.41	3.6	80	15	0.02 ~0.03	✓			Roughing 粗銑			
												Medium 中	●	●	▲
												Finishing 精銑	●	●	●

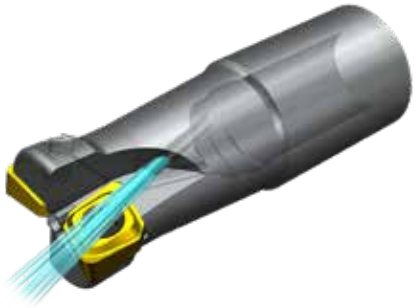
●: Main Application 主要應用　▲: Secondary Application 次要應用

Unit/單位: mm

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

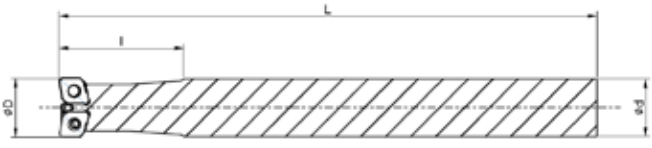
Item Code 規格碼	Dimensions (mm) 規格						Available Tools 適用工具		
	D	d	d1	L	l	齒數T*	Insert 刀片	Screw 星形螺絲	Screwdriver 旗形板手
SCN07-D1602	16	16	10	45	35.0	2	CN___07	M2.5x6.0x3.6xT8 (D07160100112)	T8
SCN07-D1603	16	16	10	45	35.0	3			
SCN07-D1702	17	16	10	45	35.0	2			
SCN07-D1703	17	16	10	45	35.0	3			
SCN07-D2003	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







Holder 整體刀柄

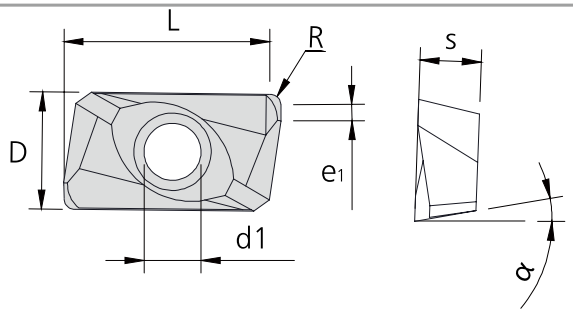
Item Code 規格碼	Dimensions (mm) 規格					Available Tools 適用工具		
	D	d	L	l	齒數T*	Insert 刀片	Screw 星形螺絲	Screwdriver 旗形板手
HCN07-D1602-S16-150	16	16	150	35	2	CN___07	M2.5x6.0x3.6xT8 (D07160100112)	T8
HCN07-D1702-S16-150	17	16	150	35	2			
HCN07-D2003-S20-150	20	20	150	40	3			
HCN07-D2103-S20-150	21	20	150	40	3			

Unit/單位: mm

Radius End Mill

■ 捨棄式圓鼻銑刀

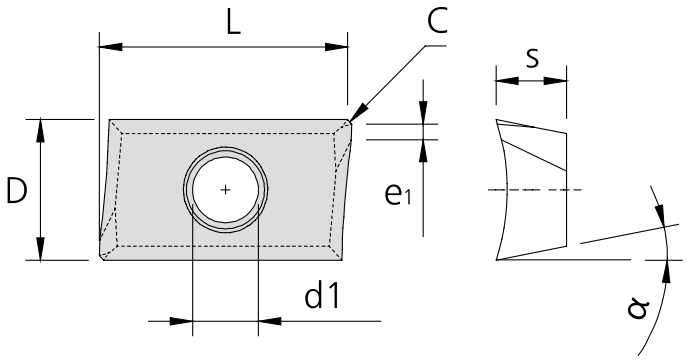
INSERTS 刀片



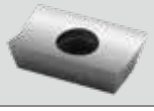
Shape 外觀	Order No. 品號	Item code 規格碼	Dimensions(mm) 規格							Coating 塗層	Available Tools 適用刀架	P	M	K
			D	L	R	e1	d1	S	α		Shrink Fit Type 燒結式 Page			
	JFAP3001	APKT1003PDER	6.7	10	0.5	1	2.8	3.5	11°	AlTiN	311	●	●	●
	JFAP3002	APKT1604PDER	9.5	15.5	0.8	1.4	4.4	5.2	11°	AlTiN				
	JFAP2001	APMT1135PDER	6.16	10.83	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

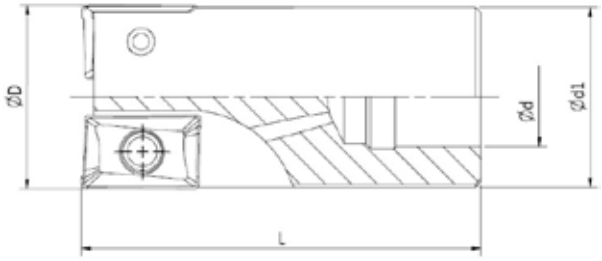
Shape 外觀	Order No. 品號	Item code 規格碼	Dimensions(mm) 規格							Coating 塗層	Available Tools 適用刀架	N
			D	L	R	e1	d1	S	α		Shrink Fit Type 燒結式 Page	
	JFAP1001	APEX1604PDFR	9.5	16.5	0.2	1.2	4.4	4.76	11°	NO	311	●
	JFAP1001-al	APEX1604PDFR	9.5	16.5	0.2	1.2	4.4	4.76	11°	TB (DLC)		

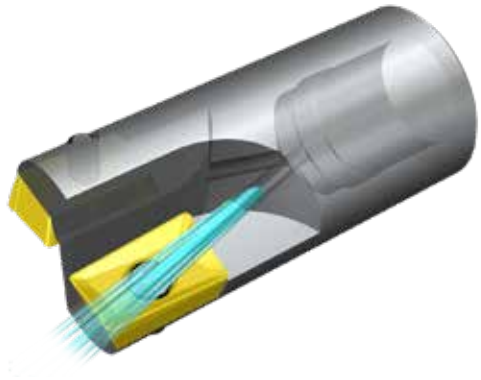
●: Main Application 主要應用　▲: Secondary Application 次要應用

Unit/單位: mm

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



Unit/單位: mm

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

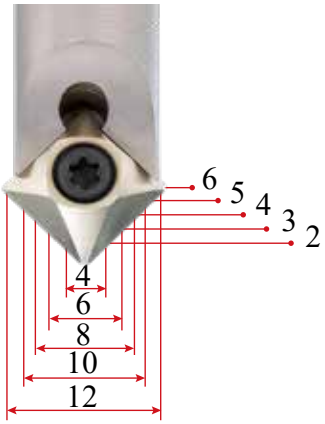
Spot Drill / Chamfer Mill + Inserts SET

■ 定點鑽/倒角刀 刀具組

MODE 型號	Holder 刀桿	D	L	α	d	e	r	Standard Accessories included 標準配件
Spot Drill(W+Cr)/ Chamfer Mill(45˚) SET	HSE1245-S16-120	16	120	45˚	16.9	40	0.8	1.Insert 刀片 (SE12T4)*5pcs 2. Wrench 扳手 (T15)*1pc 3. Screw 螺絲 (TS4006)*1pc
Spot Drill(W+Cr)/ Chamfer Mill(30˚) SET	HSE1230-S16-120	16	120	30˚	20.8	40	0.8	

● Recommend Cutting Condition: 建議加工條件 :





※ WARNING 注意 :

1.Please use high rigidity machine and tool holder.
請使用較具剛性之機械設備及夾頭。

2.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鋼性不足、出現震動時，請以相同比例按右表降低迴轉數及進給速度。

3.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 被切削材	Vc (m/min) 切削速度	fn	Diameter 直徑	Speed 轉速	Feed Rate 進給
General steel 一般鋼	100	0.06	4	8000	480
		0.04	6	5300	210
	80	0.03	8	3200	95
		0.03	10	2500	75
		0.02	12	2100	40
Carbon steel 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 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 被切削材	Vc (m/min) 切削速度	Ap 使用深度範圍	Chamfer 倒 C 角	Speed 轉速	Feed Rate 進給	fn
General steel 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
		4 ~ 6	0.5C	3200	800	0.25
			1.C		700	0.22
			2.C		550	0.17
			3.C		385	0.12
Carbon steel 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
		4 ~ 6	0.5C	1100	65	0.06
			1.C		55	0.05
			2.C		45	0.04
			3.C		35	0.03
Non-ferrous alloy 非鐵合金	150	2 ↓	0.5C	12000	3000	0.25
			1.C		2750	0.23
		2 ~ 4	0.5C	6000	1500	0.25
			1.C		1400	0.23
			2.C		1250	0.21
		4 ~ 6	0.5C	4000	1000	0.25
			1.C		920	0.23
			2.C		850	0.21
			3.C		600	0.15

mm

Unit/單位: mm

切 削 條件表 P467
Cutting Condition

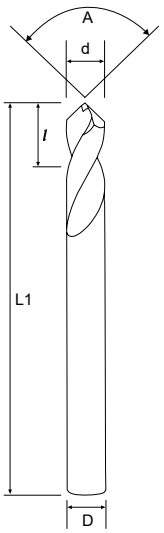
Position Drill
■ 定位鑽

600 Nano　HRC ▶45

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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, 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 ally 鈦合金	Nickel/Inconel ally 鎳基合金	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 P467
Cutting Condition

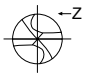
Position Drill
■ 定位鑽

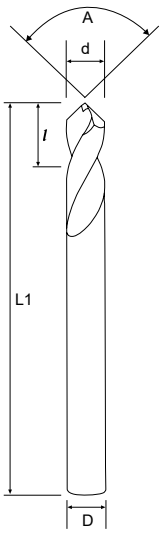
600 Nano | HRC ▶50 | ZrN-A

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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°





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-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不鏽鋼	Titanium ally 鈦合金	Nickel/Inconel ally 鎳基合金	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 P467
Cutting Condition

Position Drill - Long Shank

■ 長柄定位鑽

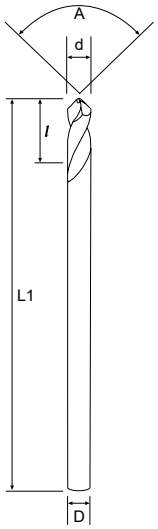
600 Nano HRC ▶45

- Micro Grain Carbide
- WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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°





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-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不鏽鋼	Titanium ally 鈦合金	Nickel/Inconel ally 鎳基合金	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 P467
Cutting Condition

Position Drill - Long Shank

■ 長柄定位鑽

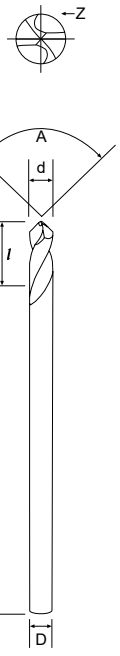
600 Nano | HRC ▶50 | ZrN-A

● Micro Grain Carbide

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



MODE 型號	Diameter d 刃徑	Flute Length l 刃長	Full Length L 全長	Shank Diameter D 柄徑	Tip Angle 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°



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-harden steel 預硬鋼	High-hardened 高硬度鋼				Stainless steel 不鏽鋼	Titanium ally 鈦合金	Nickel/Inconel ally 鎳基合金	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 P468
Cutting Condition

Reamer series

■ 鎢鋼鉸刀

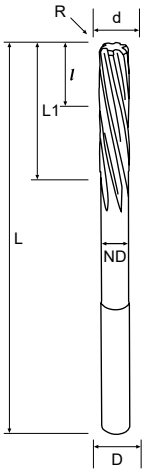
600 Nano　HRC ▶ 65

● Micro Grain Carbide

● WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 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	20	40	4
RE016	1.6	9	1.4	20	43	
RE017	1.7	9	1.5	18	43	
RE018	1.8	10	1.6	18	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	

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-harden 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 P468
Cutting Condition

Carbide Edge Reamer

■ 刃部鎢鋼頭鉸刀

● Micro Grain Carbide

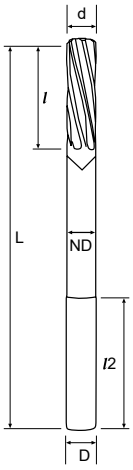
● WC=90 Co=10 HV30=1571 Rupture=3750N/mm^2 Grain Size=0.6μm



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 prefect 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, 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	Copper alloy 銅合金,銅	Aluminum alloy 鋁合金
	~45HRC	~50HRC	~55HRC	~60HRC	~65HRC			
○	○	○	○	○	○	○	○	○

Unit/單位: mm

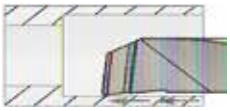
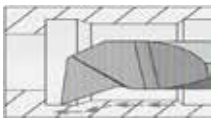
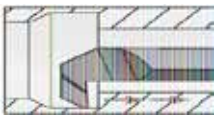
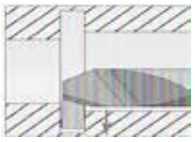
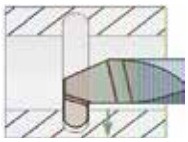
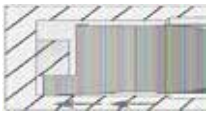
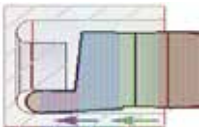
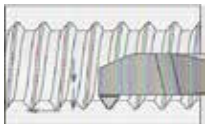
MINI SPEED

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 型號	Type 類型	Item 品名	Min. boring hole diameter 最小加工孔徑	Coating 塗層	Spec. 規格表
BR		Boring 搪孔	Ø0.5mm~Ø8.0mm	TiSiN	322
PF22		Profiling & Boring 仿形 & 搪孔	Ø1.0mm~Ø8.0mm	TiSiN	323
PF47		Profiling & Boring 仿形 & 搪孔	Ø1.0mm~Ø8.0mm	TiSiN	324
BT		Back Turning 背車削	Ø4.0mm~Ø8.0mm	TiSiN	325
IG		Internal Grooving 內徑溝槽	Ø4.0mm~Ø8.0mm	TiSiN	326
IGR		Internal Grooving Radius 內徑圓溝槽	Ø4.0mm~Ø8.0mm	TiSiN	327
FG		Face Grooving 端面溝槽	Ø4.0mm~Ø8.0mm	TiSiN	328
FGR		Face Grooving Radius 端面圓溝槽	Ø4.0mm~Ø6.0mm	TiSiN	328
CP		Chamfering & Profiling 倒角 & 仿形	Ø1.0mm	TiSiN	329
TA		Threading 螺紋車削	Ø2.3mm~Ø6.0mm	TiSiN	329

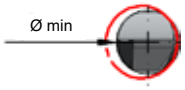
Unit/單位: mm

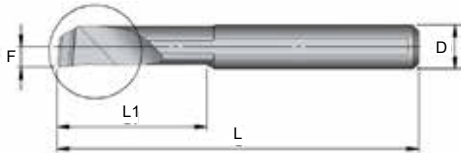
Boring
■ 搪孔

切削條件表 P330 Cutting Condition

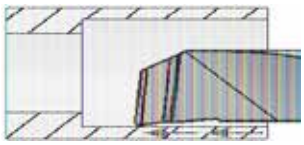
TiSiN











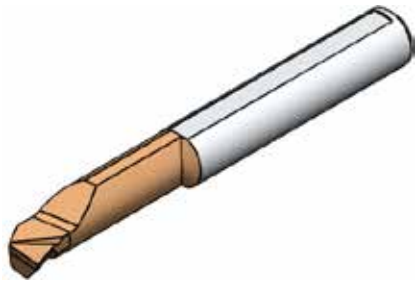
MODE 型號	D	Ø min	F	L	L1	R
BR07-05.003-015 R/L	4	0.5	0.2	50	1.5	0.03
BR07-05.003-025 R/L	4	0.5	0.2	50	2.5	0.03
BR07-10.005-03 R/L	4	1	0.4	50	3.0	0.05
BR07-10.005-05 R/L	4	1	0.4	50	5.0	0.05
BR07-20.005-06 R/L	4	2	0.8	50	6.0	0.05
BR07-20.005-10 R/L	4	2	0.8	50	10.0	0.05
BR07-20.005-14 R/L	4	2	0.8	50	14.0	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

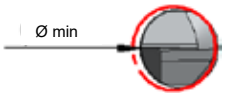
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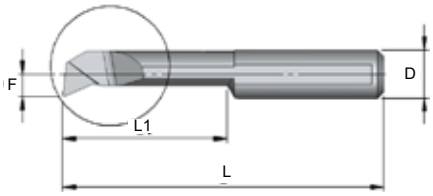
Profiling & Boring
■ 仿形&搪孔

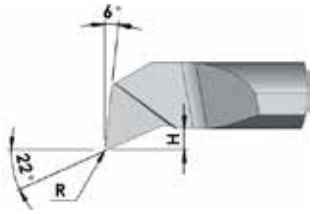
切削條件表 P330 Cutting Condition

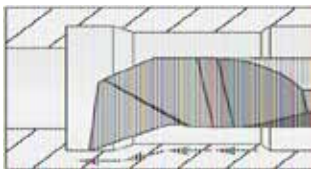
TiSiN











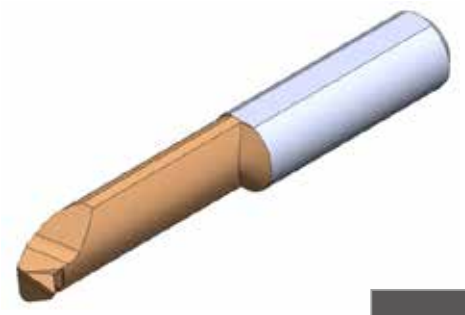
MODE 型號	D	Ø min	F	L	L1	R	H
PF22-10.005-03 R/L	4	1	0.4	50	3	0.05	0.2
PF22-10.005-05 R/L	4	1	0.4	50	5	0.05	0.2
PF22-20.005-06 R/L	4	2	0.8	50	6	0.05	0.4
PF22-20.005-10 R/L	4	2	0.8	50	10	0.05	0.4
PF22-20.005-14 R/L	4	2	0.8	50	14	0.05	0.4
PF22-30.010-09 R/L	4	3	1.3	50	9	0.1	0.6
PF22-30.010-15 R/L	4	3	1.3	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

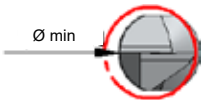
Unit/單位: mm

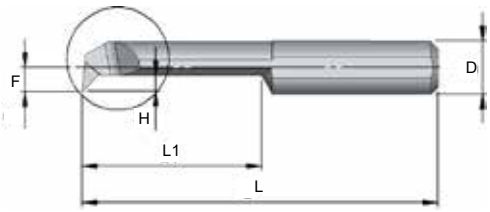
Profiling & Boring
■ 仿形&搪孔

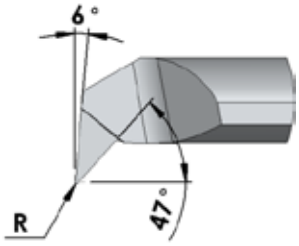
切削條件表 P330 Cutting Condition

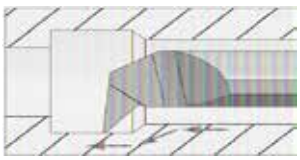
TiSiN









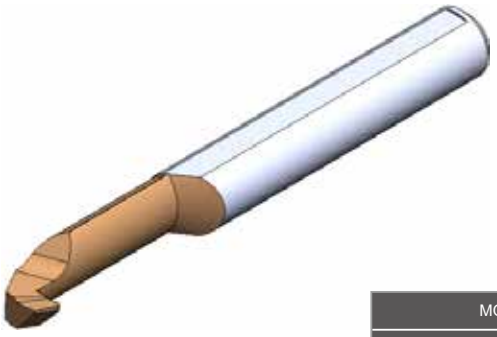


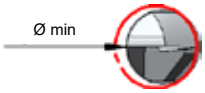
MODE 型號	D	Ø min	F	L	L1	R	H
PF47-10.005-03 R/L	4	1	0.4	50	3	0.05	0.2
PF47-10.005-05 R/L	4	1	0.4	50	5	0.05	0.2
PF47-20.005-06 R/L	4	2	0.8	50	6	0.05	0.4
PF47-20.005-10 R/L	4	2	0.8	50	10	0.05	0.4
PF47-20.005-14 R/L	4	2	0.8	50	14	0.05	0.4
PF47-30.010-09 R/L	4	3	1.3	50	9	0.1	0.6
PF47-30.010-15 R/L	4	3	1.3	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

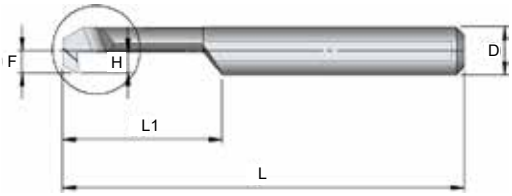
Unit/單位: mm

Back Turning
■ 背車削

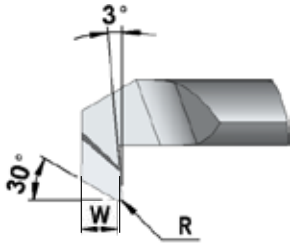
切削條件表 P330 Cutting Condition
TiSiN

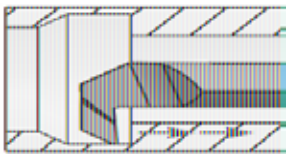






MODE 型號	D	Ø min	F	L	L1	R	H	W
BT30-40.010-12 R/L	4	4	1.8	50	12	0.1	1	1.5
BT30-40.010-20 R/L	4	4	1.8	50	20	0.1	1	1.5
BT30-60.020-18 R/L	6	6	2.8	50	18	0.2	1.5	2
BT30-60.020-30 R/L	6	6	2.8	60	30	0.2	1.5	2.5
BT30-80.020-24 R/L	8	8	3.8	60	24	0.2	2	2.5
BT30-80.020-40 R/L	8	8	3.8	75	40	0.2	2	2.5





Unit/單位: mm

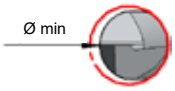
Internal Grooving

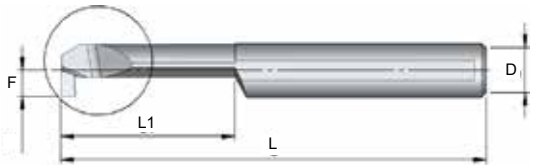
■ 內徑溝槽

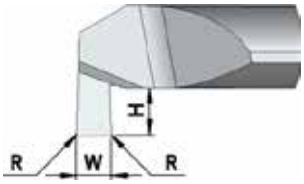
切削條件表 P330 Cutting Condition

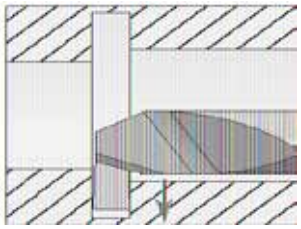
TiSiN











MODE 型號	D	Ø min	F	L	L1	W	R	H
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

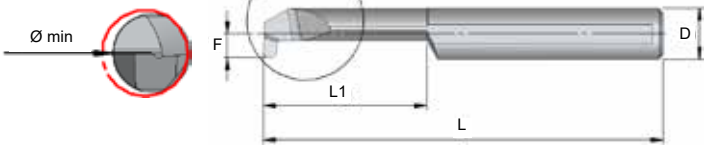
Unit/單位: mm

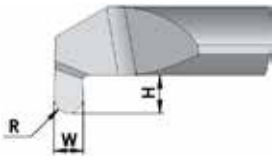
Internal Grooving Radius
■ 內徑圓溝槽

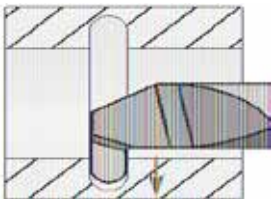
切削條件表 P330 Cutting Condition

TiSiN









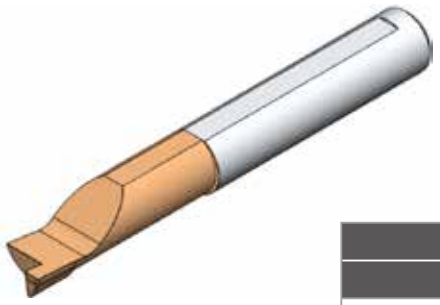
MODE 型號	D	Ø min	F	L	L1	W	R	H
IGR10-40.050-12 R/L	4	4	1.8	50	12	1.0	0.50	1.0
IGR15-40.075-12R/L	4	4	1.8	50	12	1.5	0.75	1.0
IGR20-40.100-12 R/L	4	4	1.8	50	12	2.0	1.00	1.3
IGR10-60.050-18 R/L	6	6	2.8	50	18	1.0	0.50	1.6
IGR15-60.075-18 R/L	6	6	2.8	50	18	1.5	0.75	1.6
IGR20-60.100-18 R/L	6	6	2.8	50	18	2.0	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

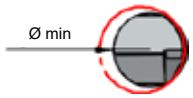
Unit/單位: mm

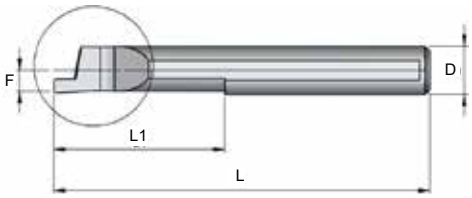
Face Grooving
■ 端面溝槽

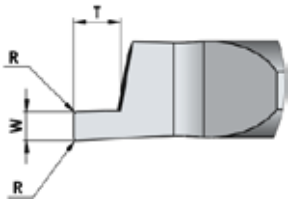
切削條件表 P330 Cutting Condition

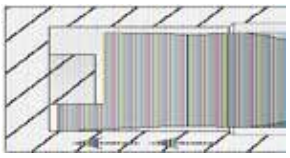
TiSiN









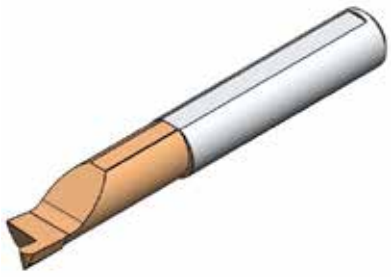


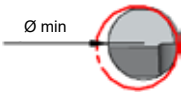
MODE 型號	D	Ø min	F	L	L1	W	R	T
FG075-40.010-15 R/L	4	4	1.8	50	15	0.75	0.1	1.2
FG100-40.010-15 R/L	4	4	1.8	50	15	1.00	0.1	1.5
FG150-40.010-15 R/L	4	4	1.8	50	15	1.50	0.1	2.6
FG075-50.010-22 R/L	6	5	2.3	50	22	0.75	0.1	1.2
FG100-50.010-22 R/L	6	5	2.3	50	22	1.00	0.1	1.5
FG150-50.010-22 R/L	6	5	2.3	50	22	1.50	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

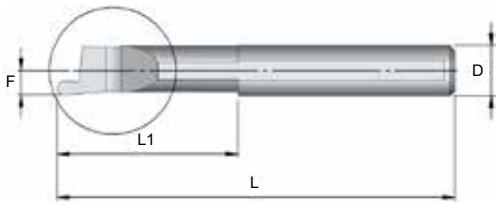
Face Grooving Radius
■ 端面圓溝槽

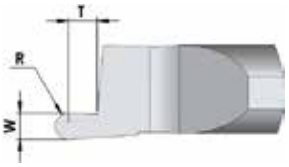
切削條件表 P330 Cutting Condition

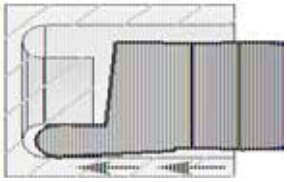
TiSiN











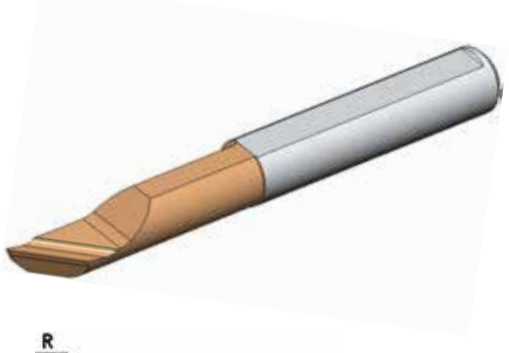
MODE 型號	D	Ø min	F	L	L1	W	R	T
FGR100-40.050-15 R/L	4	4	1.8	50	15	1.0	0.50	1.2
FGR150-40.075-15 R/L	4	4	1.8	50	15	1.5	0.75	1.5
FGR100-50.050-22 R/L	6	5	2.3	50	22	1.0	0.50	1.2
FGR150-50.075-22 R/L	6	5	2.3	50	22	1.5	0.75	1.5
FGR200-50.100-22 R/L	6	5	2.3	50	22	2.0	1.00	2.5
FGR100-60.050-22 R/L	6	6	2.3	50	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

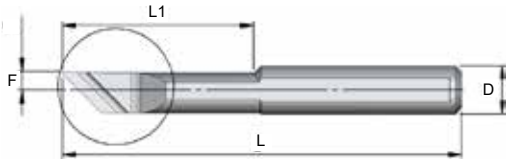
Unit/單位: mm

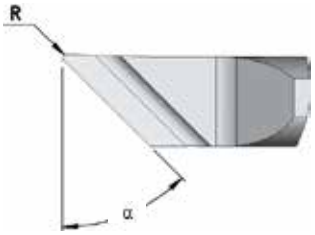
Chamfering & Profiling
■ 倒角&仿形

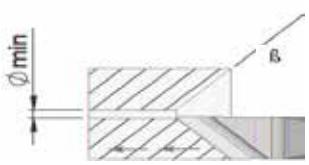
切削條件表 P330 Cutting Condition

TiSiN







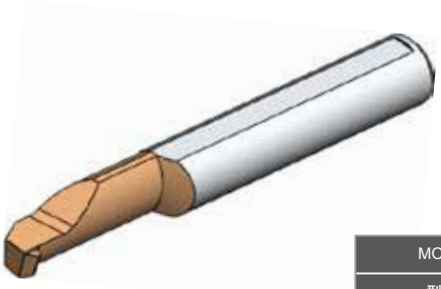


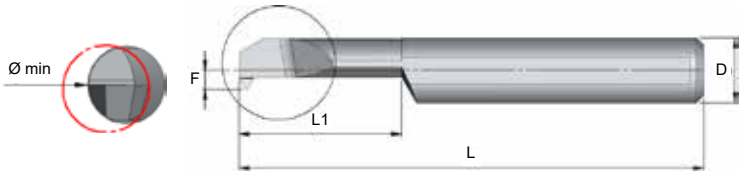
MODE 型號	D	Ø min	F	L	L1	α	β	R
CP30-10.020-18	6.0	1	2.3	50	18	30	60	0.2
CP45-10.020-18	6.0	1	2.3	50	18	45	45	0.2
CP60-10.020-18	6.0	1	2.3	50	18	60	30	0.2

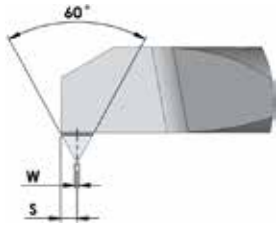
Threading
■ 螺紋車削

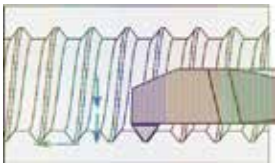
切削條件表 P331 Cutting Condition

TiSiN









MODE 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

Unit/單位: mm

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 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給	Work Materials 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給
低碳鋼，易削鋼 S10C，SUM22等...	50-140	0.01-0.12	碳鋼，合金鋼 S45C，SCM415等...	30-120	0.01-0.1
不鏽鋼 SUS303，SUS430等…	20-100	0.01-0.1	灰鑄鐵，球墨鑄鐵 FC200，FCD400等…	30-100	0.01-0.08
鋁合金 A5052，A6061，A7025等…	50-140	0.01-0.12	鈦合金，耐熱合金 Ti-6Al-4V(TC4)等…	20-80	0.01-0.08
黃銅 C2801，C3604等…	50-150	0.01-0.12			

• Internal Cutting 內徑槽切削

Work Materials 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給	Work Materials 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給
低碳鋼，易削鋼 S10C，SUM22等...	50-140	0.01-0.04	碳鋼，合金鋼 S45C，SCM415等...	30-120	0.01-0.04
不鏽鋼 SUS303，SUS430等...	20-100	0.01-0.04	灰鑄鐵，球墨鑄鐵 FC200，FCD400等...	30-100	0.01-0.04
鋁合金 A5052，A6061，A7025等...	50-140	0.01-0.04	鈦合金，耐熱合金 Ti-6Al-4V(TC4)等...	20-80	0.01-0.04
黃銅 C2801，C3604等...	50-150	0.01-0.04			

• Face Cutting 端面槽切削

Work Materials 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給	Work Materials 被切削材料	Vc(m/min) 切削速度	F(mm/rev) 進給
低碳鋼，易削鋼 S10C，SUM22等...	50-140	0.01-0.06	碳鋼，合金鋼 S45C，SCM415等...	30-120	0.01-0.06
不鏽鋼 SUS303，SUS430等...	20-100	0.01-0.06	灰鑄鐵，球墨鑄鐵 FC200，FCD400等...	30-100	0.01-0.06
鋁合金 A5052，A6061，A7025等...	50-140	0.01-0.06	鈦合金，耐熱合金 Ti-6Al-4V(TC4)等...	20-80	0.01-0.06
黃銅 C2801，C3604等...	50-150	0.01-0.06			

Unit/單位: mm

TA

產品規格表 P329
Specification page

• Internal Threading 內徑螺紋切削

Work Materials 被切削材料	Vc(m/min) 切削速度	P-0.5mm Number of Passes 進刀次數	P-0.75mm Number of Passes 進刀次數	P-1.0mm Number of Passes 進刀次數	P-1.25mm Number of Passes 進刀次數	P-1.5mm Number of Passes 進刀次數
低碳鋼・易削鋼 S10C・SUM22等...	50-150	5~7	7~9	9~11	11~14	14~17
碳鋼・合金鋼 S45C・SCM415等...	30-120	6~8	8~10	10~12	12~15	15~18
不鏽鋼 SUS303・SUS430等...	20-100	8~10	10~12	12~14	15~17	18~20
灰鑄鐵・球墨鑄鐵 FC200・FCD400等...	30-100	7~9	9~11	11~13	14~16	17~19
鋁合金 A5052・A6061・A7025等...	50-150	6~8	8~10	10~12	12~14	15~17
黃銅 C2801・C3604等...	50-150	6~8	8~10	10~12	12~14	15~17

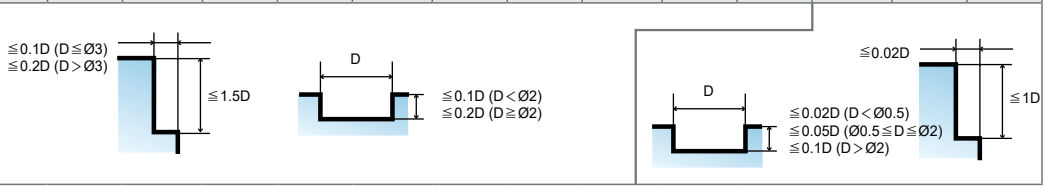
Unit/單位: mm

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 被削材	Copper 銅			Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼，合金鋼 ~HRC30			HRC30~45 Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened steels, AISI H13 合金鋼，工具鋼			Austenitic stainless steels SUS304,SUS316等 AISI 304,AISI 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11, NAK,STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	80~150m/min			50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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 isespecially 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回轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之 1/3 以下。

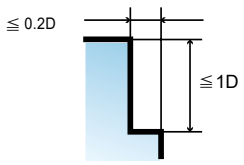
Unit/單位: mm

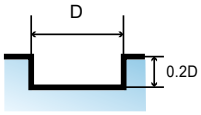
產品規格表 P37-38
Specification page

• P-SSE/P-MSE/P-SE 2 Flutes Slotting 溝銑切削

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度





Unit/單位: mm

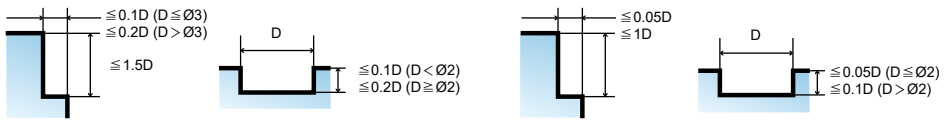
P-SSE/P-MSE/P-SE
產品規格表 P39-40
Specification page

P-MPE/P-PE(45˚)
產品規格表 P43-44
Specification page

• P-SSE/P-MSE/P-SE/P-MPE/P-PE(45˚) 4T Side Milling 側銑切削

WORK MATERIAL 被切削材	MILD STEELS, CARBON STEELS, CAST IRON SS400、S55C、FC250(~750N/mm²) 一般構造用鋼、碳素鋼、鑄鐵		ALLOY STEELS, TOOL STEELS SCM、SKT、SKS、SKD ~HRC30合金鋼、工具鋼		HARDENED STEELS, PREHARDENED STEELS SKT、SKD、NAK55、HPM1 HRC30~38 調質鋼、預硬鋼		STAINLESS STEELS, HARDENED STEELS SUS304、SKD HRC38~45不鏽鋼、調質鋼		HARDENED STEELS, TITANIUM ALLOY STEELS HRC45~55 調質鋼、鈦合金		HEAT RESISTANT ALLOY STEELS INCONEL 耐熱合金鋼、高鎳合金	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速
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

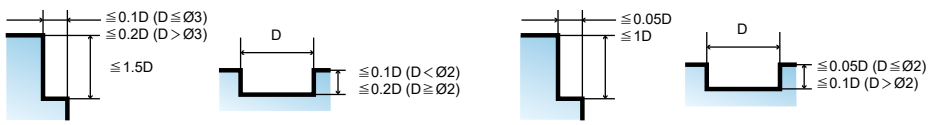
DEPTH OF CUT 加工深度



• P-SSE/P-MSE/P-SE/P-MPE/P-PE(45˚) 4T Slotting 溝銑切削

WORK MATERIAL 被切削材	MILD STEELS, CARBON STEELS, CAST IRON SS400、S55C、FC250(~750N/mm²) 一般構造用鋼、碳素鋼、鑄鐵		ALLOY STEELS, TOOL STEELS SCM、SKT、SKS、SKD ~HRC30合金鋼、工具鋼		HARDENED STEELS, PREHARDENED STEELS SKT、SKD、NAK55、HPM1 HRC30~38 調質鋼、預硬鋼		STAINLESS STEELS, HARDENED STEELS SUS304、SKD HRC38~45不鏽鋼、調質鋼		HARDENED STEELS, TITANIUM ALLOY STEELS HRC45~55 調質鋼、鈦合金		HEAT RESISTANT ALLOY STEELS INCONEL 耐熱合金鋼、高鎳合金	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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
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



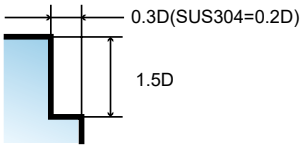
Unit/單位: mm

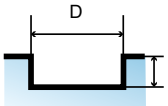
產品規格表 P41-42
Specification page

• P-MPE/P-PE (45°) 3 Flutes Slotting Milling 溝銑切削

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
直徑 MILL DIA. (mm)	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度





Ø1~2.5=0.5D
Ø3~12=1D
(SKD, SCM=0.5D)

Unit/單位: mm

P-SLE/P-MLE 產品規格表 P46 Specification page

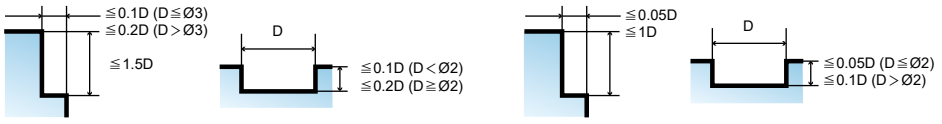
SUPE 產品規格表 P198 Specification page

SUS 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 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼，合金鋼~HRC30			Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened Steels, AISI H13 合金鋼，工具鋼HRC30~45			Austenitic stainless Steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened Steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	50~100m/min			50~70m/min			30~60m/min			30~50m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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回轉數及進給速度。
4. 縱向進給時，進給速度請設定為上表之 1/3 以下。

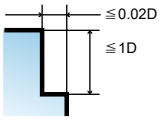
Unit/單位: mm

P-SLE/P-MLE
產 品 規格表 **P46**
Specification page

SUPE
產 品 規格表 **P198**
Specification page

SUS
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 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼・合金鋼 ~HRC30		Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened steels, AISI H13 合金鋼・工具鋼HRC30~45		Hardened steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50	
Cutting Speed 切削速度	300m/min		200m/min		100m/min	
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 (D:直徑Dia) 切削量基準						

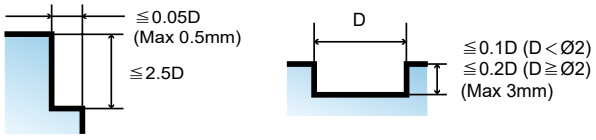
Unit/單位: mm

產品規格表 P47
Specification page

● P-LET 2 Flutes Side MILING　P-LET 2刃 側銑

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度



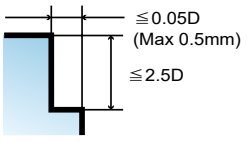
Unit/單位: mm

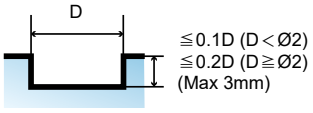
產品規格表 P48
Specification page

• P-LET 4 Flutes Side Milling P-LET 4刃 側銑

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼		
			~32HRC		HRC33~41		HRC42~50
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 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 加工深度





Unit/單位: mm

產品規格表 P49-51
Specification page

● P-LNT 2 Flutes Slotting　P-LNT 2刃 溝銑切削

WORK MATERIAL 被切削材		COPPER, ALUMINUM ALLOY 銅、鋁合金			MILD STEELS, CARBON STEELS,SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼			HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELSSKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼					
					~32HRC			HRC33~41			HRC42~50		
MILL DIA. (mm) 直徑	Efficient Length 有效長	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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
	16	18,000	288	0.010	15,000	240	0.008	15,000	240	0.007	12,000	160	0.006
1.2	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
	12	20,500	576	0.048	17,000	480	0.040	16,000	400	0.030	14,000	320	0.030
1.4	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
	20	14,500	400	0.024	12,000	336	0.020	11,000	304	0.015	10,000	240	0.010
1.6	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
	18	15,500	576	0.048	13,000	480	0.040	13,000	400	0.030	9,000	240	0.030
1.8	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
2.0	6	18,000	1,040	0.372	15,000	880	0.310	14,000	800	0.260	11,000	560	0.210
	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

Unit/單位: mm

產品規格表 P49-51
Specification page

● P-LNT 2 Flutes Slotting　P-LNT 2刃 溝銑切削

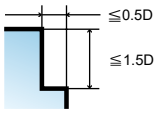
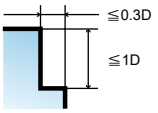
WORK MATERIAL 被切削材		COPPER, ALUMINUM ALLOY 銅、鋁合金			MILD STEELS, CARBON STEELS,SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼			HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELSSKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼					
					~32HRC			HRC33~41			HRC42~50		
MILL DIA. (mm) 直徑	Efficient Length 有效長	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	Ap	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度													

Unit/單位: mm

P-NTA 產品規格表 P52 Specification page

SUNTA 產品規格表 P204 Specification page

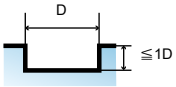
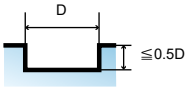
• P-NTA,SUNTA 3 Flutes Side Cutting 側面切削

Work Material 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 切削深度										

P-NTA 產品規格表 P52 Specification page

SUNTA 產品規格表 P204 Specification page

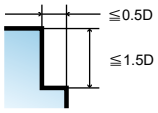
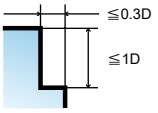
• P-NTA,SUNTA 3 Flutes Slot Cutting 溝加工

Work Material 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 切削深度										

Unit/單位: mm

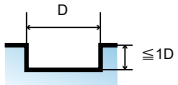
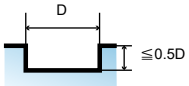
P-NTA 產品規格表 P53 Specification page
SUNTA 產品規格表 P205 Specification page

• 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 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 andnoise 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.

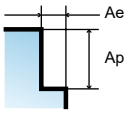
1. 切削沃斯田鐵系列不鏽鋼時，使用水溶性切削油效果較好，切削耐熱合金時，使用非水溶性切削油效果較好。
2. 若切削深度很淺，可提高轉速和進給速度。
3. 若機床設備或工件材料的安裝剛性很低，或出現震顫和噪音，請相應地同比例降低轉速和進給速度，或者請減少切削深度。
4. 建議在側面加工時使用順銑。

Unit/單位: mm

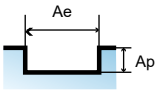
P-XTA
產品規格表 P54
Specification page

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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 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	Ap 1.5D, Ae 0.4D						Ap 1.5D, Ae 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	進給速度 Feed Rate (mm/min)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 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	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.

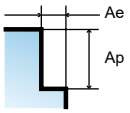
1. 請採用吹氣冷卻方式或使用不易產生油煙的切削液。
2. 在產生異常震動時，請降低轉速和進給速度。
3. 請使用精度高剛性好的設備和夾具。

Unit/單位: mm

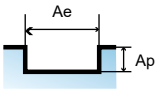
P-XTA
產 品 規格表 **P55**
Specification page

SUXTA
產 品 規格表 **P207**
Specification page

• P-XTA,SUXTA 4 Flutes Side Cutting 側面切削

Work Material 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 切削深度	Ap 1.5D / Ae 0.4D						Ap 1.5D / Ae 0.3D			

• P-XTA,SUXTA 4 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^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	進給速度 Feed Rate (mm/min)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 切削深度	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。

Unit/單位: mm

產品規格表 P56-59
Specification page

• P-TTA 2 Flutes Standard Cutting Conditons 標準切削

WORK MATERIAL 被切削材	Copper 銅			Carbon Steels,Alloy Steels,S50C,SCM, 鑄鐵FC250等 AISI 1049,Cast iron 碳素鋼・合金鋼~HRC30			HRC30~45 Alloy Steels,Tool Steels, 調質鋼,SKD61,NAK等 Prehardened steels,AISI H13 合金鋼,工具鋼			Austenitic stainless steels SUS0304,SUS316等 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11,NAK,STAVAX 等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	80~150m/min			50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Shank 柄徑(mm)	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	
		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削
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 加工深度	≦0.1D (D≦Ø3) ≦0.2D (D＞Ø3) ≦1.5D D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) ≦0.02D D ≦0.02D (D＜Ø0.5) ≦0.05D (Ø0.5≦D≦Ø2) ≦0.1D (D＞Ø2) ≦1D														

產品規格表 P60-61
Specification page

• P-LTTA 2 Flutes Standard Cutting Conditons 標準切削

WORK MATERIAL 被切削材	Carbon Steels,Alloy Steels,S50C,SCM, 鑄鐵FC250等 AISI 1049,Cast iron 碳素鋼・合金鋼~HRC30			HRC30~45 Alloy Steels,Tool Steels,調質鋼,SKD61,NAK等 Prehardened steels,AISI H13 合金鋼,工具鋼			Austenitic stainless steels SUS0304,SUS316等 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11,NAK,STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	30~50m/min			30~40m/min			20~30m/min			15~25m/min		
Shank 柄徑(mm)	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度		SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	
		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削		Side Milling 側銑	Slotting 溝銑切削
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 加工深度	≦0.05D (Max 0.5mm) ≦2.5D D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) (Max 3mm) ≦0.02D (Max 0.3mm) ≦2D D ≦0.05D (Max 0.5mm)											

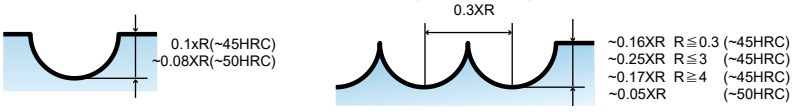
Unit/單位: mm

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 被削材	Carbon Steels S50C 碳素鋼		Alloy Steels Prehardened Steels SCM SKD SUS HPM NAK 合金鋼，調質鋼		Hardened Steels SKD61~HRC50 調質鋼		Aluminum 鋁		Copper 銅	
Cutting Speed 切削速度	150m/min		120~150m/min		80~100m/min		150~m/min		100~150m/min	
R	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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



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. Use Oil-mist coolant or Air blow.
4. Adjust both spindle speed and feed according to Milling conditions and machine rigidity.

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. 主軸回轉速及床台進給速度，請以相同比例作適度調整。

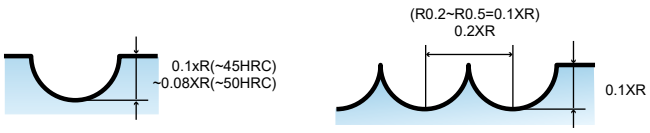
Unit/單位: mm

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 HIGH - SPEED Milling Conditions 高速標準切削

Work Material 被削材	Carbon Steels S50C 碳素鋼		Alloy Steels SCM, SKD, SUS 合金鋼		Prehardened Steels HPM, NAK 調質鋼		Hardened Steels SKD61~HRC50 調質鋼	
Cutting Speed 切削速度	250m/min		200m/min		180m/min		100m/min	
R	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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)



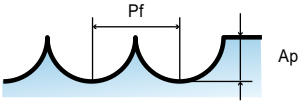
1.When Slotting, reduce the feed by 60% from above values.
2.Length of overhang is 4 times dia. as standard. When it is longer then 4 times dia., follow figures of above table.
3. Recommend Oil-mist coolant or Air blow.
4.If the rigidity of the machine or the work material installation is very low, or 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回轉數及進給速度。
5. 請使用較具剛性之機械設備及夾頭。

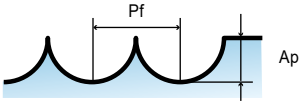
Unit/單位: mm

產品規格表 P63
Specification page

• P-SSB/P-MSB/P-SB 2 Flutes Regular Milling 標準切削

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金				MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼				HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼							
					~32HRC				HRC33~41				HRC42~50			
R	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min)進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度	
			Ap	Pf			Ap	Pf			Ap	Pf			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	0.080	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 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金				MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼				HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼							
					~32HRC				HRC33~41				HRC42~50			
R	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度	
			Ap	Pf			Ap	Pf			Ap	Pf			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																

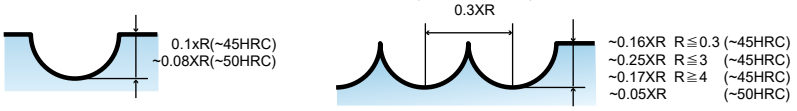
Unit/單位: mm

產品規格表 P64
Specification page

• P-SSB/P-MSB/P-SB 4 Flutes Regular Milling 標準切削

WORK MATERIAL 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
R	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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

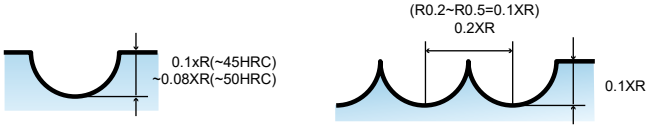
DEPTH OF CUT 加工深度



• 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 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
R	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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

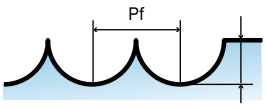
DEPTH OF CUT 加工深度



Unit/單位: mm

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 被切削材		COPPER, ALUMINUM ALLOY 銅、鋁合金				MILD STEELS, CARBON STEELS,SS400 、S55C、FC250、NAK55 一般構造用鋼、碳素鋼				HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼							
						~32HRC				HRC33~41				HRC42~50			
R	(Efficient Length) 有效長	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 加工深度		SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	DEPTH OF CUT 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
	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
0.80	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
	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
0.90	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																	

Unit/單位: mm

產品規格表 P68
Specification page

• P-PBTA 2 Flutes Standard Cutting Conditons 標準切削

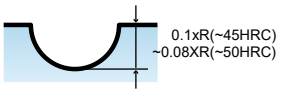
Working material hardness 被切削材硬度	HRC45~52		HRC52~ 55	
Mode	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min mm/分
PBTA0101T	8800	260	7920	234
PBTA0151T	6900	190	4950	171
PBTA0201T	5600	420	5040	378
PBTA0205T	5600	420	4320	378
PBTA0301T	7200	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

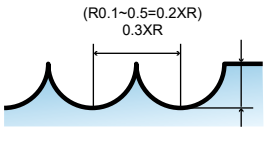
產品規格表 P69-70
Specification page

• P-TBTA 2 Flutes Standard Cutting Conditons 標準切削

WORK MATERIAL 被切削材	Carbon Steels S50C 碳素鋼		Alloy Steels Prehardened Steels SCM SKD HPM NAK 合金鋼、調質鋼		Hardened Steels SKD61~HRC50 調質鋼		Aluminum 鋁		Copper 銅	
Cutting Speed 切削速度	150m/min		120~150m/min		80~100m/min		150~m/min		100~150m/min	
Shank 柄徑(mm)	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 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 加工深度





~0.16XR R≦0.3 (~45HRC)
~0.25XR R≦3 (~45HRC)
~0.17XR R≧4 (~45HRC)
~0.05XR (~50HRC)

Unit/單位: mm

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 被切削材	COPPER, ALUMINUM ALLOY 銅、鋁合金		MILD STEELS, CARBON STEELS, SS400、S55C、FC250、NAK55 一般構造用鋼、碳素鋼		HARDENED STEELS, PREHARDENED STEELS, STAINLESS STEELS SKT、SKD61、NAK80、HPM1、DH 調質鋼、預硬鋼、不鏽鋼			
			~32HRC		HRC33~41		HRC42~50	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度	≦0.02D ≦1D				D 0.02D			

Unit/單位: mm

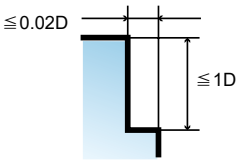
P-RTA
產品規格表 P73-74
Specification page

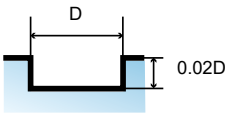
P-LRTA
產品規格表 P76
Specification page

• P-RTA/P-LRTA 4 Flutes Slotting
P-RTA/P-LRTA 4刃 溝銑切削

WORK MATERIAL 被切削材	MILD STEELS, CARBON STEELS, CAST IRON SS400、S55C、FC250 (~750N/mm²) 一般構造用鋼、碳素鋼、鑄鐵		ALLOY STEELS, TOOL STEELS SCM、SKT、SKS、SKD ~HRC30合金鋼、工具鋼		HARDENED STEELS, PREHARDENED STEELS SKT、SKD、NAK55、HPM1 HRC30~38 調質鋼、預硬鋼		STAINLESS STEELS, HARDENED STEELS SUS304、SKD HRC38~45 不鏽鋼、調質鋼		HARDENED STEELS, TITANIUM ALLOY STEELS HRC45~55 調質鋼、鈦合金		HEAT RESISTANT ALLOY STEELS INCONEL 耐熱合金鋼、高鎳合金	
MILL DIA. (mm) 直徑	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 進給速	SPEED (min^{-1}) 迴轉速	FEED (mm/min) 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 加工深度





Unit/單位: mm

產品規格表 P82-83
Specification page

• P-UMIE 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter D	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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	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%。

Unit/單位: mm

產品規格表 P84
Specification page

• P-UET 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Diameter D	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P85
Specification page

• P-UET 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Diameter D 值	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

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 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼，合金鋼 ~HRC30			Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened steels, AISI H13 合金鋼，工具鋼HRC30~45			Austenitic stainless steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11, NAK,STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	30~50m/min			30~40m/min			20~30m/min			15~25m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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	≦0.05D (Max 0.5mm) ≦2.5D; D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) (Max 3mm)						≦0.02D (Max 0.3mm) ≦2D; D ≦0.05D (Max 0.5mm)					

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回轉數及進給速度。
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

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 被削材	Carbon Steels, Alloy SteelsS50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼，合金鋼~HRC30			HRC30~45 Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened Steels, AISI H13 合金鋼，工具鋼			Austenitic stainless Steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened Steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50			Non is essential please don't attempt Hardened Steels SKD11等 AISI D2 [非必要請勿嘗試] 熱處理鋼(HRC50~60)		
Cutting Speed 切削速度	35~50m/min			30~40m/min			20~30m/min			15~25m/min			15~20m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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	≦0.05D (Max 0.5mm) ≦2.5D; D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) (Max 3mm)									≦0.02D (Max 0.3mm) ≦2D; D ≦0.05D (Max 0.5mm)					

1. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
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. When drilling, please set the feed rate at 1/3 or below of the above value.

1. 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。
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回轉數及進給速度。
3. 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 P88
Specification page

• P-UVT Multi Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 55°	
Diameter D 值	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	HRC30~ 50		HRC50~ 55°	
Diameter D 值	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

P-ULNT
產品規格表 P90
Specification page

P-SFULNT
產品規格表 P126
Specification page

• P-ULNT,P-SFULNT 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter-efficiency length 刃徑-有效	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P90-91
Specification page

• P-ULNT 3 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter-efficiency length 刃徑-有效	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	HRC30~ 50		HRC50~ 55	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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%。

Unit/單位: mm

產品規格表 P94
Specification page

• P-UBT 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC52		~HRC60	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	~HRC30		HRC52		~HRC60	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P96
Specification page

• P-UBTSX 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	~HRC30		~HRC52		~HRC60	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

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 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter-efficiency length 刃徑-有效	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

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 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter-efficiency length 刃徑-有效	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分
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

Unit/單位: mm

產品規格表 P100
Specification page

• P-UPBT 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC45~ 52		HRC52~ 62	
Mode	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	HRC30~ 50		HRC50~ 55°	
MODE 型號	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P102-103
Specification page

• P-URTA 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分
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

Unit/單位: mm

產品規格表 P104
Specification page

• P-URTA 4 Flutes Cutting Condition 標準切削

Arial Unicode MS	~HRC30		~HRC50		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. 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

Unit/單位: mm

產品規格表 P105-106
Specification page

• P-UCRS 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/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

Unit/單位: mm

產品規格表 P107-108
Specification page

• P-UCRS 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. mm/分	Rotational speed 轉速 RPM 轉/分	Feeding speed 進給 mm/min. 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

Unit/單位: mm

產品規格表 P109
Specification page

● P-UCR 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC50		~HRC60	
MODE 型號	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分
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%。

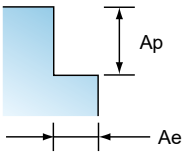
Unit/單位: mm

PVE 產品規格表 P110 Specification page
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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 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦275			≦375			≦375			>375 ≦475			>475 ≦655		
HRC	≦28.5			≦39.8			≦39.8			>39.8 ≦49.1			>50 ≦65		
Vc (SFM)	155	(150-163)		90	(86-93)		36	(35-38)		60	(58-62)		25	(24-26)	
Ae/Ap	Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D 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

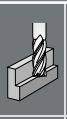
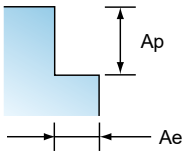
Depth of cut



Unit/單位: mm

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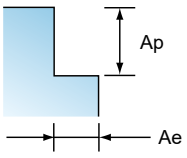
● PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Side Milling
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列側銑

Side Milling 	CAST IRONS (LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 303, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦220			>220 ≦260			≦275			≦275			≦325		
HRC	≦18.8			>18.8 ≦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 Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D 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															

Unit/單位: mm

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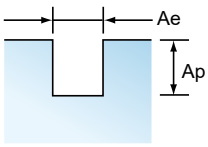
• PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Side Milling
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列側銑

Side Milling 	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦300			>300			≦350			>350 ≦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 Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D 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												

Unit/單位: mm

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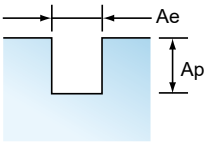
• PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Slotting
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列溝銑切削

Slot Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦275			≦375			≦375			>375 ≦475			>475 ≦655		
HRC	≦28.5			≦39.8			≦39.8			>39.8 ≦49.1			>50 ≦65		
Vc (SFM)	125	(120-130)		57	(55-60)		29	(28-30)		48	(46-50)		20	(19-21)	
Ae/Ap	Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D 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	RPM	Fz	Feed 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															

Unit/單位: mm

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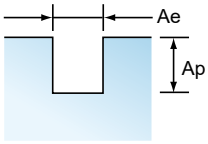
• PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR Series Slotting
PVE/PVES/PVEM/PVEL/PVEC/PVB/PVBSX/PVR 系列溝銑切削

Slot Milling 	CAST IRONS (LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 304, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦220			>220 ≦260			≦275			≦275			≦325		
HRC	≦18.8			>18.8 ≦26.6			≦28.5			≦28.5			≦34.4		
Vc (SFM)	64	(62-67)		61	(59-64)		88	(84-92)		61	(59-64)		56	(54-59)	
Ae/Ap	Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D 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	RPM	Fz	Feed 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															

Unit/單位: mm

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• 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 (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦300			＞300			≦350			＞350 ≦440		
HRC	≦32.1			≦32.1								
Vc (SFM)	14	(13-15)		11	(10-12)		40	(38-42)		14	(13-15)	
Ae/Ap	Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D 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												

Unit/單位: mm

產品規格表 P118-119
Specification page

• P-SFUMIE 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 60	
Diameter D	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P120-121
Specification page

● P-SFUET 2,4 Flutes 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		HRC30~35		HRC35~40		HRC40~45		HRC45~65	
Diameter D 值	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

Unit/單位: mm

產品規格表 P130-131
Specification page

● P-SFUBT 2,4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		HRC30~45		HRC45~65	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P122
Specification page

• P-SFULET 2 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼・合金鋼 ~HRC30			Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened steels, AISI H13 合金鋼・工具鋼HRC30~45			Austenitic stainless steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11, NAK,STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	30~50m/min			30~40m/min			20~30m/min			15~25m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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	≦0.05D (Max 0.5mm) ≦2.5D; D; ≦0.1D (D<Ø2) ≦0.2D (D≧Ø2) (Max 3mm); ≦0.02D (Max 0.3mm) ≦2D; D; ≦0.05D (Max 0.5mm)											

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回轉數及進給速度。
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 P123
Specification page

• P-SFULET 4 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材	Carbon Steels, Alloy SteelsS50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼・合金鋼~HRC30			HRC30~45 Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened Steels, AISI H13 合金鋼・工具鋼			Austenitic stainless Steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened Steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50			Non is essential please don't attempt Hardened Steels SKD11等 AISI D2 [非必要請勿嘗試] 熱處理鋼(HRC50~60)		
Cutting Speed 切削速度	35~50m/min			30~40m/min			20~30m/min			15~25m/min			15~20m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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	≦0.05D (Max 0.5mm) ≦2.5D; D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) (Max 3mm)									≦0.02D (Max 0.3mm) ≦2D; D ≦0.05D (Max 0.5mm)					

1. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
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. When drilling, please set the feed rate at 1/3 or below of the above value.

1. 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。
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回轉數及進給速度。
3. 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 被切削材硬度	HRC45~ 52		HRC52~ 62	
Diameter D 值	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	HRC45~ 52		HRC52~ 62	
Diameter D 值	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P126-127
Specification page

• P-SFULNT 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	HRC30~ 50		HRC50~ 55	
Diameter-efficiency length 刃徑-有效	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	HRC30~ 50		HRC50~ 60	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P130-131
Specification page

• P-SFUBT 2,4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		HRC30~45		HRC45~65	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P132
Specification page

• P-SFUBTSX 2 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		HRC30~45		HRC45~65	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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 被切削材硬度	Below ~HRC30		HRC30~45		HRC45~65	
Radius of Ball Nose R 徑	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. 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

Unit/單位: mm

產品規格表 P136
Specification page

● P-SFURTA 4 Flutes 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter × Radius D × R	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min	RPM	mm/min
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 被切削材硬度	~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/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

Unit/單位: mm

產品規格表 P138
Specification page

• P-SFUCRM 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/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 被切削材硬度	~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/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

Unit/單位: mm

產品規格表 P141-142
Specification page

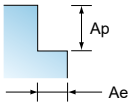
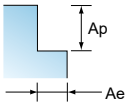
• P-SFUCRS 4 Flutes Cutting Condition 標準切削

Working material hardness 被切削材硬度	~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter × Radius D × R	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給	Rotational speed 轉速	Feeding speed 進給
	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/分	RPM 轉/分	mm/min. mm/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 x1R	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 x1R	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 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 調質鋼HRC30~35		SUS304.SKD 調質鋼HRC38~45		SKD61等 焠火鋼HRC45~50	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)
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 切削基準量 (D=直徑Dia)	*Side milling（側銑） Ae: 0.1 D Ap: 1.5 D						*Side milling（側銑） Ae:0.05 D Ap: 1.0 D	

Unit/單位: mm

產品規格表 P150
Specification page

● DAB Series Cutting Condition 標準切削

Working material hardness 被切削材硬度	Below HRC30		HRC30~45		HRC45~65	
Radius of Ball Nose	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給
	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min 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

Unit/單位: mm

產品規格表 P151
Specification page

• DAC Series Cutting Condition 標準切削

Working material hardness 被切削材硬度	Below ~HRC30		~HRC40		~HRC50		~HRC55		~HRC60	
Diameter X Radius D X R	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給	Rotational Speed 轉速	Feeding Speed 進給
	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min mm/分	RPM 轉/分	mm/min 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	2252	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	965	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	855	1242	392	897	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	761	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

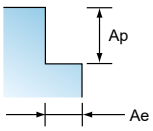
Working material 被切削材	ACRYLIC 壓克力				ALUMINIUM-IS<8% 鋁合金			
Diameter 直徑 (mm)	Rotational Speed 轉速	Feeding Speed 進給	Vc 切速	Fz 每刃進給	Rotational Speed 轉速	Feeding Speed 進給	Vc 切速	Fz 每刃進給
2	32000	2200	200	0.069	23000	1500	145	0.065
3	25000	2400	235	0.096	18000	1700	170	0.094
4	20000	2400	250	0.12	15000	1800	190	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 切削基準量 (D=直徑Dia)	Ae=1D Ap=1.5D							

Unit/單位: mm

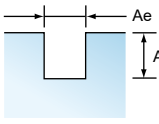
AE5
產 品 規格表 P156-157
Specification page

AET
產 品 規格表 P160-161
Specification page

• AE5,AET 2T Series Side Milling 側銑切削

Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	140m/min		380m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑） Ap=2.0D Ae=0.5D			
	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

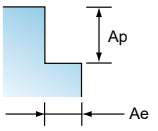
Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	90m/min		310m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)
3	9,740	700	32,910	2630
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 切削基準量 (D=直徑Dia)	*Slotting（溝銑） Ap=2.0D Ae=1.0D			
	V線速度	90	V線速度	310
	Z刃數	2	Z刃數	2
	Fz	0.04	Fz	0.04

Unit/單位: mm

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 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	70m/min		190m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ap=4.5D Ae=0.05D			
	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.

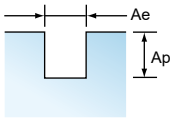
1. 溝加工時之進給速度，請設定為上述值之 60%。
2. 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
3. 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
4. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低回轉數及進給速度。
5. 請使用較具剛性之機械設備及夾頭。

Unit/單位: mm

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 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	50m/min		160m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Slotting（溝銑） Ap=2.0D Ae=1.0D			
	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.

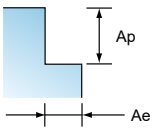
1. 溝加工時之進給速度，請設定為上述值之 60%。
2. 刀具夾持突出量以 4D 為基準，超出上述場合時，請將切削條件作適度之調整。
3. 請使用油霧 (Oil-mist) 冷卻或吹氣方式 (Air blow) 進行切削。
4. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低回轉數及進給速度。
5. 請使用較具剛性之機械設備及夾頭。

Unit/單位: mm

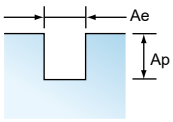
AE5
產 品 規格表 P158-159
Specification page

AET
產 品 規格表 P162-163
Specification page

• AE5,AET 3T Series Side Milling 側銑切削

Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	140m/min		380m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ap=2.0D Ae=0.5D			
	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

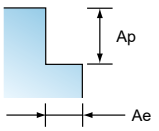
Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	90m/min		310m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)
3	9,740	1,040	32,910	3950
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 切削基準量 (D=直徑Dia)	*Slotting（溝銑）  Ap=2.0D Ae=1.0D			
	V線速度	90	V線速度	310
	Z刃數	3	Z刃數	3
	Fz	0.04	Fz	0.04

Unit/單位: mm

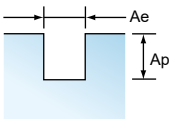
AEL5
產品規格表 P158-159
Specification page

ALET
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Specification page

• AEL5,ALET 3T Series Side Milling 側銑切削

Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	70m/min		190m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑） Ap=4.5D Ae=0.05D			
	V線速度	70	V線速度	190
	Z刃數	3	Z刃數	3
	Fz	0.04	Fz	0.05

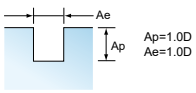
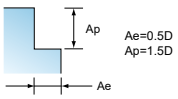
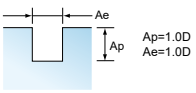
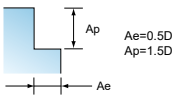
• AEL5,ALET 3T Series Slotting 溝銑切削

Work Material 被削材	COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)	50m/min		160m/min	
Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Slotting（溝銑） Ap=2.0D Ae=1.0D			
	V線速度	50	V線速度	160
	Z刃數	3	Z刃數	3
	Fz	0.02	Fz	0.02

Unit/單位: mm

產 品 規格表 P166-167
Specification page

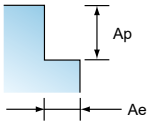
• ANT 3 Flutes 標準切削

Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金	
Velocity	250-400 mm/min		150-250 mm/min	
Type No. 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 加工深度	*Slotting（溝銑）  Ap=1.0D Ae=1.0D	*Side milling（側銑）  Ae=0.5D Ap=1.5D	*Slotting（溝銑）  Ap=1.0D Ae=1.0D	*Side milling（側銑）  Ae=0.5D Ap=1.5D

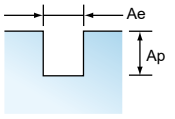
Unit/單位: mm

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Specification page

• CE 2T Series Side Milling 側銑切削

Work Material 被削材		COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)		140m/min		380m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)		*Side milling（側銑）  Ap=2.0D Ae=0.5D			
		V線速度	140	V線速度	380
		Z刃數	2	Z刃數	2
		Fz	0.04	Fz	0.04

• CE 2T Series Slotting 溝銑切削

Work Material 被削材		COPPER,COPPER ALLOY 銅，銅合金		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金	
Max Cutting Speed(V) 最大切削速度(V)		90m/min		310m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)		*Slotting（溝銑）  Ap=2.0D Ae=1.0D			
		V線速度	90	V線速度	310
		Z刃數	2	Z刃數	2
		Fz	0.02	Fz	0.02

Unit/單位: mm

CEL
產 品 規格表 P170
Specification page

SULNT
產 品 規格表 P202-203
Specification page

• CEL,SULNT 2 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材		Carbon Steels, Alloy Steels Prehardened Steels S50C, SCM, SKD, SUS, HPM, NAK 碳素鋼，合金鋼，調質鋼		Aluminum 鋁		Copper 銅		Plastics 塑膠	
Cutting Speed 切削速度		30~80m/min		100~200m/min		50~150m/min		50~80m/min	
Diameter (mm) 直徑	Ad Depth of cut (mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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，來調整切削量及回轉數，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。

Unit/單位: mm

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 被削材		Carbon Steels S50C(~225HB) 碳素鋼		Alloy Steels SCM, SK, SUS (225~325HB) 合金鋼		Prehardened Steels Hardened steels NAK.SKD HRC30~45 調質鋼		Hardened steels SKD11.61.SKT HRC40~50 調質鋼	
Cutting Speed 切削速度		50~65m/min		40~55m/min		30~50m/min		30~40m/min	
R	Ad Depth of cut (mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 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 (R:球頭半徑) 切削量基準		≦0.1R (R≦1) ≦0.2R (R>1) 							

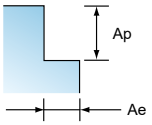
1. Use a rigid machine and holder.
2. If the rigidity of the machine or the work material installation is very low, or chattering is generated, please reduce the revolution and the feed rate proportionately.
3. Use cutting fluid with retardant.

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回轉數及進給速度。
3. 請使用不容易冒煙之切削油劑。

Unit/單位: mm

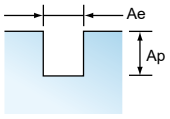
AUE 產品規格表 P174 Specification page
AUR 產品規格表 P176 Specification page
S-AUE 產品規格表 P178 Specification page

• AUE,AUR,S-AUE Series 3 Flutes Side Milling 側銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed(V) 最大切削速度(V)		240m/min		87m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)		Ap=2.0D Ae=0.5D *Side milling（側銑） 			
		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

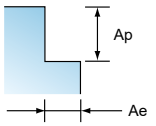
• AUE,AUR,S-AUE Series 3 Flutes Slotting 溝銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed(V) 最大切削速度(V)		250m/min		90m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉數 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉數 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)		Ap=1.5D Ae=1.0D *Slotting（溝銑） 			
		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

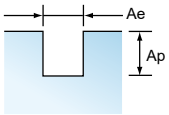
Unit/單位: mm

產品規格表 P174
Specification page

• AUEL Series 3 Flutes Side Milling 側銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed (V) 最大切削速度(V)		240m/min		87m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)		Ap=4.5D Ae=0.05D		*Side milling（側銑） 	
		V線速度	120	V線速度	43.96
		Z刃數	3	Z刃數	3
		Fz	0.066	Fz	0.06

• AUEL Series 3 Flutes Slotting Milling 溝銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed (V) 最大切削速度(V)		240m/min		87m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)		Ap=1.0D Ae=1.0D		*Slotting（溝銑） 	
		V線速度	125.6	V線速度	46.472
		Z刃數	3	Z刃數	3
		Fz	0.060	Fz	0.084

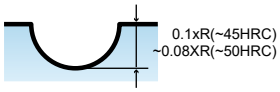
Unit/單位: mm

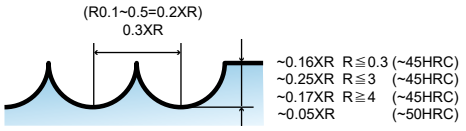
產品規格表 P175
Specification page

• AUB Series 標準切削

Work Material 被削材	Aluminum 鋁		Copper 銅	
Cutting Speed 切削速度	150m/min		150m/min	
Radius	Speed 迴轉數 (min^{-1})	Feed Rate (mm/min) 進給速度	Speed 迴轉數 (min^{-1})	Feed Rate (mm/min) 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
切削基準量
(R=球頭半徑)

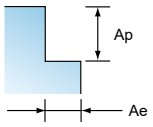




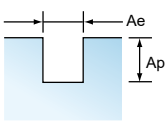
Unit/單位: mm

產品規格表 P179
Specification page

• AAS,AA 3 Flutes Side Milling 側銑切削

Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金		Copper alloy C1100 銅	
Cutting Speed 切削速度	200m/min		200m/min		75m/min	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 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 加工深度	*Side milling（側銑）  Ae=0.1D Ap=1.5D					

• AAS,AA 3 Flutes Slotting 溝銑切削

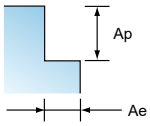
Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金		Copper alloy C1100 銅	
Cutting Speed 切削速度	200m/min		200m/min		75m/min	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度
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 加工深度	*Slotting（溝銑）  Ap=1.0D Ae=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.

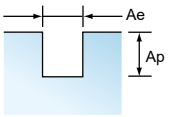
Unit/單位: mm

產品規格表 P180
Specification page

• AAL Series 3 Flutes Side Milling 側銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed (V) 最大切削速度(V)		240m/min		87m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)		*Side milling（側銑）  Ap=4.5D Ae=0.05D			
		V線速度	100	V線速度	40
		Z刃數	3	Z刃數	3
		Fz	0.05	Fz	0.045

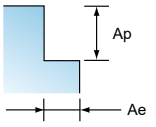
• AAL Series 3 Flutes Slotting Milling 溝銑切削

Work Material 被削材		Aluminum alloy expanding material A7075 Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Max Cutting Speed (V) 最大切削速度(V)		240m/min		87m/min	
TYPE NO.	Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)		*Slotting（溝銑）  Ap=2.0D Ae=1.0D			
		V線速度	100	V線速度	45
		Z刃數	3	Z刃數	3
		Fz	0.035	Fz	0.043

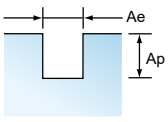
Unit/單位: mm

產品規格表 P181
Specification page

• CMF Series Side Milling 側銑切削

Work Material 被削材	Aluminum alloy expanding material A7075 Aluminum alloy casting< Sil 13% 鋁合金		Copper 銅	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ap=2.0D Ae=0.05D			
Vc 線速度	235.5		87.92	
Z 刃數	3		3	
Fz	0.11		0.1	

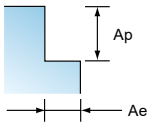
• CMF Series Slotting 溝銑切削

Work Material 被削材	Aluminum alloy expanding material A7075 Aluminum alloy casting< Sil 13% 鋁合金		Copper 銅	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Slotting（溝銑）  Ap=1.5D Ae=1D			
Vc 線速度	251.2		92.944	
Z 刃數	3		3	
Fz	0.1		0.14	

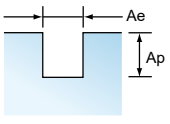
Unit/單位: mm

產品規格表 P182
Specification page

• CA-AA 3 Flutes Side Milling 側銑切削

Work Material 被削材	Aluminum alloy expanding material A7075		Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ap=1.5D Ae=0.1D					

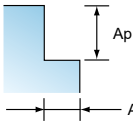
• CA-AA 3 Flutes Slotting Milling 溝銑切削

Work Material 被削材	Aluminum alloy expanding material A7075		Aluminum alloy casting<Sil 13% 鋁合金		Copper 銅	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Slotting（溝銑）  Ap=1.5D Ae=1.0D					

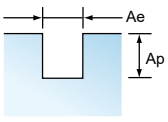
Unit/單位: mm

產品規格表 P183-184
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• CR-AA 3 Flutes Side Milling 側銑切削

Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金		Copper alloy C1100 銅	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 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

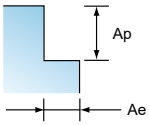
Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金		Copper alloy C1100 銅	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度
CRAA 03--	21000	670	21000	670	7950	325
CRAA 04--	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.

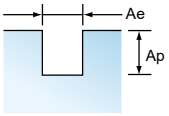
Unit/單位: mm

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 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金		Copper alloy C1100 銅	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 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 加工深度	*Side milling（側銑）  Ae=0.1D Ap=1D					

• CR-AA 3 Flutes High Speed Slotting 高速溝銑切削

Work Material 被削材	Aluminum alloy expanding material A7075 鋁合金		Aluminum alloy casting<Sil 13% 鋁合金	
Type No. 型號	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (mm^{-1}) 迴轉速度	Feed (mm/min) 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 加工深度	*Slotting（溝銑）  Ae=1.0D Ap=0.25D			

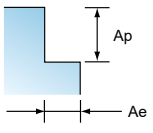
Unit/單位: mm

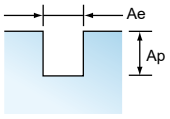
產 品 規格表 P188
Specification page

PVE1T/PLVE1T Cutting Condition

Type	PVE1T		
Side Milling 	TITANIUM ALLOYS(DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	60		
Ae/Ap	Ae=0.4D 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) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	50		
Ae/Ap	Ae=1D 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) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	60		
Ae/Ap	Ae=0.2D 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
Depth of cut			

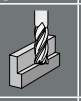
Type	PLVE1T		
Slot Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	50		
Ae/Ap	Ae=1D Ap=1.5D		
MILL DIA (Metric)	RPM	Fz	Feed 4 Flutes
4	3980	0.0079	126.4
5	3184	0.0143	181.9
6	2653	0.0212	224.6
8	1990	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
Depth of cut			

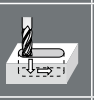
Unit/單位: mm

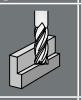
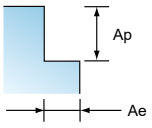
PNVE1T/PVE1TF
產品規格表 P189-190
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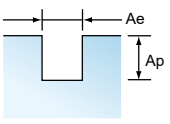
PVR1T
產品規格表 P191
Specification page

PNVE1T/PVE1TF/PVR1T Cutting Condition

Type	PNVE1T, PVE1TF					
Side Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3					
Hardness BRINELL	≦300					
HRC	≦31					
Vc	60			50		
Ae/Ap	Ae=0.65D Ap=1D			Ae=0.4D 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) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3					
Hardness BRINELL	≦300					
HRC	≦31					
Vc	50			40		
Ae/Ap	Ae=1D Ap=0.9D			Ae=1D 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) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	18		
Ae/Ap	Ae=0.4D 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
Depth of cut			

Type	PVR1T		
Slot Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦300		
HRC	≦31		
Vc	18		
Ae/Ap	Ae=1D 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
Depth of cut			

Unit/單位: mm

產品規格表 P196-197
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● SUPE 3 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材	Carbon Steels S50C 碳素鋼				Alloy Tool Steels, SCM, SKD 合金工具鋼				Stainless Steels, Titanium Alloys SUS304, SUS316等 不鏽鋼, 鈦合金				Prehardened Steels, HPM, NAK 調質鋼~HRC40			
Cutting Speed 切削速度	~100m/min				~50m/min				~35m/min				~56m/min			
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		
		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 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，請降低回轉速及進給速度。
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。

Unit/單位: mm

產品規格表 P199
Specification page

• SULPE 4 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼・合金鋼 ~HRC30			HRC30~45 Alloy Steels,Tool Steels 調質鋼, SKD61, NAK等 Prehardened Steels, AISI H13 合金鋼・工具鋼			Austenitic stainless Steels SUS304, SUS316等 AISI 304, AISI 316 沃斯田鐵系列不鏽鋼			Hardened Steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50			Non is essential please don't attempt Hardened Steels SKD11等 AISI D2 [非必要請勿嘗試] 熱處理鋼(50~60HRC)		
Cutting Speed 切削速度	35~50m/min			30~40m/min			20~30m/min			15~25m/min			15~20m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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	≦0.05D (Max 0.5mm) ≦2.5D; D ≦0.1D (D＜Ø2) ≦0.2D (D≧Ø2) (Max 3mm)									≦0.02D (Max 0.3mm) ≦2D; D ≦0.05D (Max 0.5mm)					

1. In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
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. When drilling, please set the feed rate at 1/3 or below of the above value.

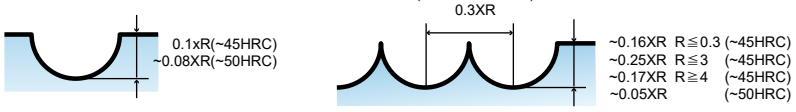
1. 切削沃斯田鐵系列不鏽鋼以及耐熱合金時，請使用非水溶性切削油效果較好。
2. 機械設備或工件的夾持剛性不足、出現震動時，請以相同比例按上表降低回轉數及進給速度。
3. 縱向進給時，進給速度請設定為上表之 1/3 以下。

Unit/單位: mm

● SUBT 4 Flutes Standard Cutting Conditons 標準切削

WORK MATERIAL 被切削材	Carbon Steels S50C 碳素鋼		Alloy Steels Prehardened Steels SCM SKD HPM NAK 合金鋼、調質鋼		Hardened Steels SKD61~HRC50 調質鋼		Aluminum 鋁		Copper 銅	
Cutting Speed 切削速度	150m/min		120~150m/min		80~100m/min		150~m/min		100~150m/min	
R	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 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

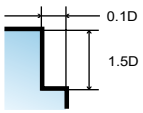
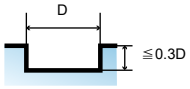
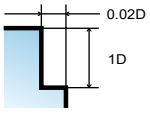
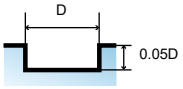
DEPTH OF CUT 加工深度



Unit/單位: mm

產品規格表 P214-215
Specification page

• SURTA 3 Flutes Standard Cutting Conditions 標準切削

Work Material 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 碳素鋼，合金鋼~HRC30			Alloy Steels, Tool Steels 調質鋼, SKD61, NAK等 Prehardened Steels, AISI H13 合金鋼，工具鋼HRC30~45			Austenitic stainless Steels SUS304, SUS316等 AISI 304, AISI 31G 沃斯田鐵系列不鏽鋼			Hardened Steels SKD61, SKD11, NAK, STAVAX等 AISI H13 熱處理鋼HRC45~50		
Cutting Speed 切削速度	50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate(mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate(mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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 Depth of cut (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回轉數及進給速度。
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

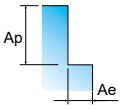
FHPS 產品規格表 P218-220 Specification page

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 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 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) 直徑	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度	 Ap 1.5D, Ae 0.2D						Ap 1.5D, Ae 0.1D				Ap 1D, Ae 0.05D	

• FHPS,FHP,FHPM/FHPL,CRFHP 4 Flutes Slotting 溝標準切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 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) 直徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度	 Ap=0.5D								Ap=0.05D			

Unit/單位: mm

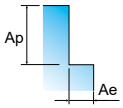
FHPS 產品規格表 P218-220 Specification page

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 SpeedSide Milling 高速側面切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 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) 直徑	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Spee d(mm/min) 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 加工深度												

	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 SpeedSlotting 高速溝標準切削

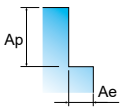
Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		Alloy steels, Tool steels, SCM, SKT,SKS,SKD~HRC30 合金鋼、工具鋼		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1 調質鋼 HRC30~38		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45	
Cutting Speed 切削速度	100 m/min		78 m/min		66 m/min		62 m/min	
Mill DIA.(mm) 直徑	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 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 加工深度	 Ap=0.2D ApMax=3mm							

Unit/單位: mm

FHPC/FHPMC/FHPLC
產品規格表 P226
Specification page

CRFHPC
產品規格表 P227
Specification page

• FHPC,FHPMC,FHPLC,CRFHPC 4 Flutes Side Milling 側面切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 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) 直 徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度												

Ap	Ae
1.5D	0.2D

Ap	Ae
1.5D	0.1D

Ap	Ae
1D	0.05D

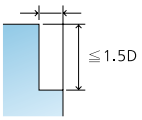
• FHPC,FHPMC,FHPLC,CRFHPC 4 Flutes4 Flutes Slotting 溝標準切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 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) 直 徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度	 Ap=0.5D								Ap=0.05D			

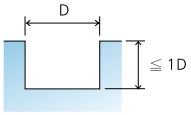
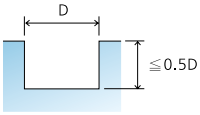
Unit/單位: mm

產品規格表 P231
Specification page

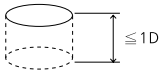
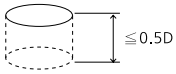
• HPSS 3 Flutes Side Milling 側面切削

Working material 被切削材	Carbon steels,Alloy steels ~HRC30 S50C,SCM,SS碳素鋼、合金剛		Mold steels HRC30~45 SKD61模具鋼		Stainless steels SUS304,SUS316 不鏽鋼	
(mm) 外 徑	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度
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			≦0.2D(D＞ø3) ≦0.1D(D≦ø3)  ≦1.5D			

• HPSS 3 Flutes Slot Milling 溝標準切削

Working material 被切削材	Carbon steels,Alloy steels ~HRC30 S50C,SCM,SS碳素鋼、合金剛		Mold steels HRC30~45 SKD61模具鋼		Stainless steels SUS304,SUS316 不鏽鋼	
(mm) 外 徑	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度
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			 ≦1D		 ≦0.5D	

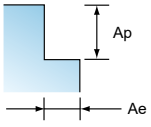
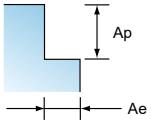
• HPSS 3 Flutes Plung Milling 垂直標準切削

Working material 被切削材	Carbon steels,Alloy steels ~HRC30 S50C,SCM,SS碳素鋼、合金剛		Mold steels HRC30~45 SKD61模具鋼		Stainless steels SUS304,SUS316 不鏽鋼	
(mm) 外 徑	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	rpm(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度
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			 ≦1D		 ≦0.5D	

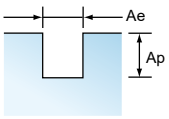
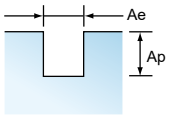
Unit/單位: mm

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等焠火鋼HRC45~50		Inconnel 耐熱合金高鎳等	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	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）  Ap=1.5D Ae=0.3D				*Side milling（側銑）  Ap=1.0D Ae=0.15D			

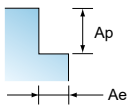
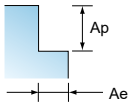
• KKH Slotting 溝標準切削

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等焠火鋼HRC45~50		Inconnel 耐熱合金高鎳等	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	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）  Ap=1.0D Ae=1D						*Slotting（溝銑）  Ap=0.5D Ae=1D	

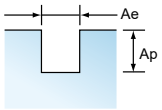
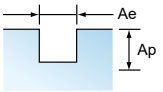
Unit/單位: mm

產品規格表 P235
Specification page

• KKM Side Milling 側面切削

Work Material 被削材	Mild seteels Carbon steels, Cast iron SS400.S55c.FC250 (-750N/mm2) 一般構造鋼.碳素鋼.鑄鐵		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		Hardened steels. Titaniun alloys. Heat resistant alloys steels. 調質鋼HRC45~55		Hardened steels. 調質鋼HRC55~60	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ae: ≦0.3 D Ap: 1.5 D						*Side milling（側銑）  Ae: ≦0.15 D Ap: 1.0 D			

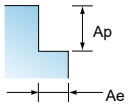
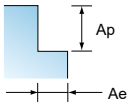
• KKM Slotting 溝標準切削

Work Material 被削材	Mild seteels Carbon steels, Cast iron SS400.S55c.FC250 (-750N/mm2) 一般構造鋼.碳素鋼.鑄鐵		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		Hardened steels. Titaniun alloys. Heat resistant alloys steels. 調質鋼HRC45~55		Hardened steels. 調質鋼HRC55~60	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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 切削基準量 (D=直徑Dia)	*Slotting（溝銑） Ap: ≦1D  						*Slotting（溝銑） Ap: ≦0.5 D  			

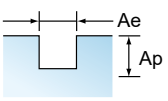
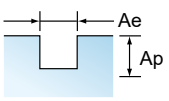
Unit/單位: mm

產品規格表 P236
Specification page

• KKF Side Milling 側面切削

Work Material 被削材	Mild steels Carbon steels, Cast iron SS400.S55c.FC250 (-750N/mm2) 一般構造鋼.碳素鋼.鑄鐵		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		Hardened steels. Titaniun alloys. Heat resistant alloys steels. 調質鋼HRC45~55		Hardened steels. 調質鋼HRC55~60	
Max Cutting Speed (V) 最大切削速度 (V)	100m/min		78m/min		66m/min		60m/min		30m/min	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)	*Side milling（側銑）  Ap=1.5D Ae≦0.3D						*Side milling（側銑）  Ap=1.0D Ae=0.15D			

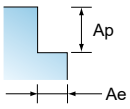
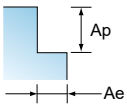
• KKF Slotting 溝標準切削

Work Material 被削材	Mild steels Carbon steels, Cast iron SS400.S55c.FC250 (-750N/mm2) 一般構造鋼.碳素鋼. 鑄鐵		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		Hardened steels. Titaniun alloys. Heat resistant alloys steels. 調質鋼HRC45~55		Hardened steels. 調質鋼HRC55~60	
Max Cutting Speed (V) 最大切削速度 (V)	100m/min		78m/min		66m/min		60m/min		30m/min	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 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 切削基準量 (D=直徑Dia)	Ap=1D Ae=1.0D *Slotting（溝銑）  						Ap=0.5D Ae=1.0D *Slotting（溝銑）  			

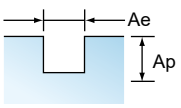
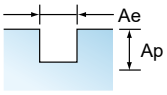
Unit/單位: mm

產品規格表 P237
Specification page

• KKR 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 調質鋼HRC30~35		SKD61等 焠火鋼HRC45~50		Inconnel 耐熱合金英高鎳等	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	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）  Ae: ≦0.3 D Ap: 1.5 D				*Side milling（側銑）  Ae: ≦0.15 D Ap: 1.0 D			

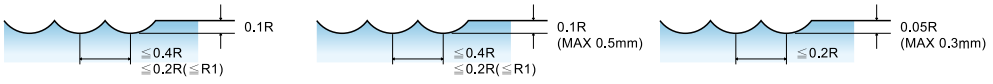
• KKR Slotting 溝標準切削

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 調質鋼HRC30~35		SKD61等 焠火鋼HRC45~50		Inconnel 耐熱合金英高鎳等	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	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)	Ap: 1.0D *Slotting（溝銑）  						*Slotting（溝銑）  Ap: 0.5 D	

Unit/單位: mm

產品規格表 P240
Specification page

• KTG 2 Flutes Standard Cutting Conditions 標準標準切削

Working material 被切削材	Alloy steels, Tool steels, SCM,SKD61,SKD11,NAK,AISI H13,AISI D2 ect 合金鋼、工具鋼、預硬鋼					Hardened steels, SKD61,SKD11,STAVAX,AISI H13 ect 調質鋼 HRC45~55				Hardened steels, SKD11,SKH,SKS,ASP23,AISI H13 ect 調質鋼 HRC55~60			
R(mm) 球頭半徑	Inclination of Machining Surface 加工面傾斜角	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad Milling Amount	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad Milling Amount	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad Milling Amount
D0.5R	α≦15°	40000	3120	≦0.2R	≦0.1R	35000	2340	≦0.2R	≦0.1R	21000	1300	≦0.2R	≦0.05R
	α＞15°	35000	2080	≦0.2R	≦0.1R	30000	1430	≦0.2R	≦0.1R	15000	740	≦0.2R	≦0.05R
D0.75R	α≦15°	40000	3900	≦0.2R	≦0.1R	30000	2470	≦0.2R	≦0.1R	14000	1160	≦0.2R	≦0.05R
	α＞15°	30000	2210	≦0.4R	≦0.1R	25000	1560	≦0.4R	≦0.1R	10000	610	≦0.2R	≦0.05R
D1R	α≦15°	35000	3900	≦0.4R	≦0.1R	25000	2340	≦0.4R	≦0.1R	11000	1040	≦0.2R	≦0.05R
	α＞15°	25000	2210	≦0.4R	≦0.1R	20000	1430	≦0.4R	≦0.1R	8000	560	≦0.2R	≦0.05R
D1.25R	α≦15°	33000	3900	≦0.4R	≦0.1R	22000	2210	≦0.4R	≦0.1R	9300	920	≦0.2R	≦0.05R
	α＞15°	24000	2210	≦0.4R	≦0.1R	17000	1300	≦0.4R	≦0.1R	6500	480	≦0.2R	≦0.05R
D1.5R	α≦15°	30000	3900	≦0.4R	≦0.1R	20000	2210	≦0.4R	≦0.1R	8000	870	≦0.2R	≦0.05R
	α＞15°	23000	2210	≦0.4R	≦0.1R	15000	1300	≦0.4R	≦0.1R	5600	450	≦0.2R	≦0.05R
D2R	α≦15°	25000	3900	≦0.4R	≦0.1R	17000	2210	≦0.4R	≦0.1R	6400	830	≦0.2R	≦0.05R
	α＞15°	20000	2210	≦0.4R	≦0.1R	13000	1300	≦0.4R	≦0.1R	4500	440	≦0.2R	≦0.05R
D2.5R	α≦15°	23000	3900	≦0.4R	≦0.1R	15000	2210	≦0.4R	≦0.1R	5000	710	≦0.2R	≦0.05R
	α＞15°	17000	2210	≦0.4R	≦0.1R	11000	1300	≦0.4R	≦0.1R	3500	380	≦0.2R	≦0.05R
D3R	α≦15°	20000	3900	≦0.4R	≦0.1R	13000	2210	≦0.4R	≦0.1R	4200	690	≦0.2R	≦0.05R
	α＞15°	15000	2210	≦0.4R	≦0.1R	10000	1300	≦0.4R	≦0.1R	2900	350	≦0.2R	≦0.05R
D4R	α≦15°	15000	3900	≦0.4R	≦0.1R	10000	2210	≦0.4R	≦0.1R	3200	700	≦0.2R	≦0.05R
	α＞15°	11000	2210	≦0.4R	≦0.1R	7500	1300	≦0.4R	≦0.1R	2200	360	≦0.2R	≦0.05R
D5R	α≦15°	12000	3770	≦0.4R	≦0.1R	8000	2080	≦0.4R	≦0.1R	2500	660	≦0.2R	≦0.05R
	α＞15°	9000	2080	≦0.4R	≦0.1R	6000	1170	≦0.4R	≦0.1R	1800	350	≦0.2R	≦0.05R
D6R	α≦15°	10000	3250	≦0.4R	≦0.1R	6600	1820	≦0.4R	≦0.1R	2100	570	≦0.2R	≦0.05R
	α＞15°	7500	1820	≦0.4R	≦0.1R	5000	1040	≦0.4R	≦0.1R	1500	300	≦0.2R	≦0.05R
Depth of cut 加工深度													

• KTG 2 Flutes High Speed Milling Conditions 高速標準切削

Working material 被切削材	Alloy steels, Tool steels, SCM,SKD61,SKD11,NAK,AISI H13,AISI D2 ect 合金鋼、工具鋼、預硬鋼					Hardened steels, SKD61,SKD11,STAVAX,AISI H13 ect 調質鋼 HRC45~55				Hardened steels, SKD11,SKH,SKS,ASP23,AISI H13 ect 調質鋼 HRC55~60			
R(mm) 球頭半徑	Milling Conditioning	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad Milling Amount	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad Milling Amount	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	切削量 (mm) Pf Pick feed	切削量 (mm) Ad 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													

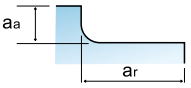
Unit/單位: mm

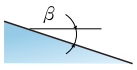
產品規格表 P241
Specification page

• KCR 4 Flutes High Speed Milling 高速標準切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Mill DIA.(mm) 直 徑	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度
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





a_a	a_r
0.1 x R	0.3D

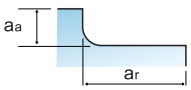
	a_a	a_r
R≦2	0.1 x R	0.3D
2＜R	0.2mm	0.3D

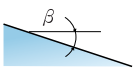
	a_a	a_r
R≦2	0.05 x R	0.3D
2＜R	0.1mm	0.3D

• KCR 4 Flutes Regular Milling (Low-speed,high-feed Milling) 標準標準切削

Working material 被切削材	Mild steels Carbon steels, Cast iron SS400,S55c,FC250 (-750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Mill DIA.(mm) 直 徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度
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





	a_a	a_r
R≦2	0.2 x R	0.5D
2＜R	0.5mm	0.5D

	a_a	a_r
R≦2	0.2 x R	0.5D
2＜R	0.4mm	0.5D

	a_a	a_r
R≦2	0.1 x R	0.5D
2＜R	0.2mm	0.5D

Unit/單位: mm

產品規格表 P245
Specification page

• BFR Series STANDARD Cutting ConditionS 標準切削

Working material 被切削材	Carbon steels, Cast iron S55c,FC250 碳素鋼、鑄鐵		Alloy steels, Mold steels, SCM,SKD 合金鋼、模具鋼		Prehardened steels HRC30~38 調質鋼		Tempered steels, Stainless steels HRC38~45 調質鋼、不鏽鋼		Hardened steels HRC45~55 高硬度鋼		Hardened steels HRC55~60 高硬度鋼	
(mm) 外徑xA半徑	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度
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 切削深度(mm)	0.1D										0.05D	
Conventional Condition 泛用切削條件	Adjust Milling condition when unusual vibration,different sound occur by cutting. 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 被切削材	Carbon steels, Cast iron S55c,FC250 碳素鋼、鑄鐵		Alloy steels, Mold steels, SCM,SKD 合金鋼、模具鋼		Prehardened steels HRC30~38 調質鋼		Tempered steels, Stainless steels HRC38~45 調質鋼、不鏽鋼		Hardened steels HRC45~55 高硬度鋼		Hardened steels HRC55~60 高硬度鋼	
(mm) 外徑xA半徑	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度	Speed(mm^{-1}) 迴轉速度	Feed(mm/min) 進給速度
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 切削深度(mm)	0.05D										0.02D	
High Speed Cutting Condition 高速切削條件	(1)When using low speed machines,use the maximum speed asn adjust the feed rate. 當使用低轉速機器，請使用最高轉速並修正進給速度。 (2)Adjust Milling condition when unusual vibration,different sound occur by cutting. 切削過程發生不正常聲音或不正常震動，請修正切削條件。											

Unit/單位: mm

產品規格表 P248
Specification page

• CDM Centering 定點切削

Work Material 被削材	Mild steels, Carbon steels, Cast iron SS400, S55C, FC250 (-750N/mm2) 一般構造鋼.碳素鋼.鑄鐵		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、預硬鋼HRC30~38		鑄鐵 FC250等 一般構造鋼.碳素鋼. ~HRC30		Aluminum alloy expanding material	
Diameter 直徑 (mm)	Rotational Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)
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 被削材	Mild steels, Carbon steels, Cast iron SS400, S55C, FC250 (-750N/mm2) 一般構造鋼.碳素鋼.鑄鐵		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、預硬鋼HRC30~38		鑄鐵 FC250等 一般構造鋼.碳素鋼. ~HRC30		Aluminum alloy expanding material	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)
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

Unit/單位: mm

ISE
產品規格表 P250-251
Specification page

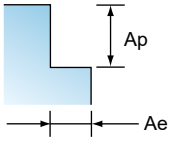
ISB
產品規格表 P252
Specification page

ISE/ISB Series Side CUTTING 側面切削

FRACTIONAL 英制

Side Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536					ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100					TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2					TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2				
Hardness BRINELL	≦175					≦275					≦375					>375 ≦475				
HRC	≦6.4					≦28					≦39.8					>39.8 ≦49.1				
Vc (SFM)	437	(350-525)				318	(255-382)				320	(256-384)				166	(133-199)			
Ae/Ap	Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D				
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 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

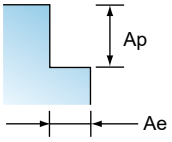
Unit/單位: mm

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ISE/ISB Series Side CUTTING 側面切削

FRACTIONAL 英制

Side Milling	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2					CAST IRONS Gray, Malleable, Ductile					STAINLESS STEELS (Free MachiNIng) 303, 416, 420F, 430F 440F					STAINLESS STEELS (Difficult) 304, 304L,316, 316L				
Hardness BRINELL	>475 ≦655					≦220					≦275					≦275				
HRC	>50 ≦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 Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D					Ae(2)=0.05D Ae(3)=0.25D Ae(4)=0.25D Ap(2)=1.5D Ap(3)=1.5D Ap(4)=1.5D				
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 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

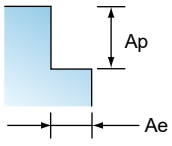
Unit/單位: mm

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ISB
產品規格表 P252
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ISE/ISB Series Side CUTTING 側面切削

FRACTIONAL 英制

Side Milling	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,718,Incoly 800,Monel 400,Rene,Waspalloy					TITANIUM ALLOYS Ti6Al4V,Ti6Al2Sn4Zr2Mo,Ti4Al4Mo2Sn0.5Si,Ti10Al2Fe3Al,Ti5Al53Mo3Cr,Ti7Al4Mo,Ti3Al8V6Cr4Zr4Mo,Ti6Al6V6Sn,Ti52 Cr3Sn3Al					GRAPHITE				
Hardness BRINELL	≦ 300					≦ 350								
HRC	≦ 32					≦ 37.9								
Vc (SFM)	62	(49-74)				170	(137-205)				627	(502-752)		
Ae/Ap	Ae(2)=0.05D Ap(2)=1.5D	Ae(3)=0.25D Ap(3)=1.5D	Ae(4)=0.25D Ap(4)=1.5D			Ae(2)=0.05D Ap(2)=1.5D	Ae(3)=0.25D Ap(3)=1.5D	Ae(4)=0.25D Ap(4)=1.5D			Ae(2)=0.05D Ap(2)=1.5D	Ae(3)=0.25D Ap(3)=1.5D	Ae(4)=0.25D Ap(4)=1.5D	
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 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

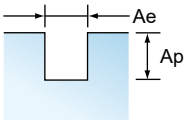
Unit/單位: mm

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ISB
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ISE/ISB Series SLOT CUTTING 溝加工

FRACTIONAL 英制

Slot Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536					ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100					TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2					TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2				
Hardness BRINELL	≦ 175					≦ 275					≦ 375					> 375 ≦ 475				
HRC	≦ 6.4					≦ 28					≦ 39.8					> 39.8 ≦ 49.1				
Vc (SFM)	350	(278-418)				255	(203-306)				256	(205-307)				133	(106-159)			
Ae/Ap	Ae(2)=1D Ae(4)=1D Ap(3)=0.5D			Ae(3)=1D Ap(2)=1D Ap(4)=0.4D		Ae(2)=1D Ae(4)=1D Ap(3)=0.5D			Ae(3)=1D Ap(2)=1D Ap(4)=0.4D		Ae(2)=1D Ae(4)=1D Ap(3)=0.5D			Ae(3)=1D Ap(2)=1D Ap(4)=0.4D		Ae(2)=1D Ae(4)=1D Ap(3)=0.5D			Ae(3)=1D Ap(2)=1D Ap(4)=0.4D	
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes
1/64	85,470	0.00003	5.1	7.7	10.3	62,245	0.00002	2.49	3.73	4.98	62393	0.00003	3.7	5.6	7.5	32479	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	31197	0.00006	3.7	5.6	7.5	16239	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	20798	0.00010	4.2	6.2	8.3	10826	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	15598	0.00013	4.1	6.1	8.1	8120	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	12479	0.00018	4.5	6.7	9.0	6496	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	10399	0.00023	4.8	7.2	9.6	5413	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	8913	0.00027	4.8	7.2	9.6	4640	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	7799	0.00030	4.7	7.0	9.4	4060	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	6933	0.00036	5.0	7.5	10.1	3609	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	6239	0.00043	5.3	8.0	10.6	3248	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	5672	0.00049	5.5	8.3	11.1	2953	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	5199	0.00055	5.7	8.6	11.4	2707	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	4799	0.00061	5.9	8.8	11.8	2498	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	4457	0.00068	6.0	9.0	12.0	2320	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	4160	0.00074	6.1	9.2	12.3	2165	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	3900	0.00080	6.2	9.4	12.5	2030	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	3670	0.00089	6.5	9.8	13.0	1911	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	3466	0.00098	6.8	10.1	13.5	1804	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	3284	0.00106	7.0	10.5	14.0	1709	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	3120	0.00115	7.2	10.8	14.4	1624	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	2971	0.00124	7.4	11.0	14.7	1547	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	2836	0.00133	7.5	11.3	15.0	1476	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	2713	0.00141	7.7	11.5	15.3	1412	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	2600	0.00150	7.8	11.7	15.6	1353	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	2496	0.00156	7.8	11.7	15.6	1299	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	2400	0.00163	7.8	11.7	15.6	1249	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	2311	0.00169	7.8	11.7	15.6	1203	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	2228	0.00175	7.8	11.7	15.6	1160	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	2151	0.00181	7.8	11.7	15.6	1120	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	2080	0.00188	7.8	11.7	15.6	1083	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	2013	0.00194	7.8	11.7	15.6	1048	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	1950	0.00200	7.8	11.7	15.6	1015	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	1733	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	1560	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	1418	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	1300	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	1114	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

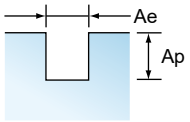
Unit/單位: mm

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ISE/ISB Series SLOT CUTTING 溝加工

FRACTIONAL 英制

Slot Milling	TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2					CAST IRONS Gray, Malleable, Ductile					STAINLESS STEELS (Free MachiNIng) 303, 416, 420F, 430F 440F					STAINLESS STEELS (Difficult) 304, 304L,316, 316L				
Hardness BRINELL	> 475 ≦ 655					≦ 220					≦ 275					≦ 275				
HRC	> 50 ≦ 65					≦ 18.8					≦ 28					≦ 28				
Vc (SFM)	57	(46-68)				255	(204-306)				281	(225-337)				194	(154-231)			
Ae/Ap	Ae(2)=1D Ae(4)=1D Ap(3)=0.5D		Ae(3)=1D Ap(2)=1D Ap(4)=0.4D			Ae(2)=1D Ae(4)=1D Ap(3)=0.5D		Ae(3)=1D Ap(2)=1D Ap(4)=0.4D			Ae(2)=1D Ae(4)=1D Ap(3)=0.5D		Ae(3)=1D Ap(2)=1D Ap(4)=0.4D			Ae(2)=1D Ae(4)=1D Ap(3)=0.5D		Ae(3)=1D Ap(2)=1D Ap(4)=0.4D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	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

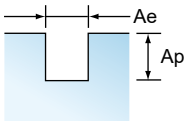
Unit/單位: mm

ISE
產品規格表 P250-251
Specification page

ISB
產品規格表 P252
Specification page

ISE/ISB Series SLOT CUTTING 溝加工

FRACTIONAL 英制

Slot Milling	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,718,Incoly 800,Monel 400,Rene,Waspalloy					TITANIUM ALLOYS Ti6Al4V,Ti6Al2Sn4Zr2Mo,Ti4Al4Mo2Sn0.5Si,Ti10Al2Fe3Al,Ti5Al53Mo3Cr,Ti7Al4Mo,Ti3Al8V6Cr4Zr4Mo,Ti6Al6V6Sn,Ti52 Cr3Sn3Al					GRAPHITE				
Hardness BRINELL	≦ 300					≦ 350								
HRC	≦ 32					≦ 37.9								
Vc (SFM)	50	(37-56)				137	(108-162)				500	(399-599)		
Ae/Ap	Ae(2)=1D Ap(2)=1D	Ae(3)=1D Ap(3)=0.5D		Ae(4)=1D Ap(4)=0.4D		Ae(2)=1D Ap(2)=1D	Ae(3)=1D Ap(3)=0.5D		Ae(4)=1D Ap(4)=0.4D		Ae(2)=1D Ap(2)=1D	Ae(3)=1D Ap(3)=0.5D		Ae(4)=1D Ap(4)=0.4D
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 2 Flutes	3 Flutes	4 Flutes	RPM	Fz	Feed (IPM) 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

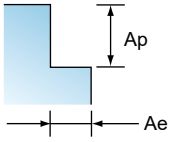
Unit/單位: mm

IAE5
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IAUE
產品規格表 P254
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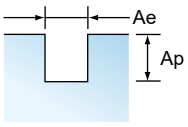
IAE5 / IAUESeries Cutting Condition 標準切削

FRACTIONAL 英制

Side Milling 	ALUMINUM ALLOYS 2017,2024,356,6061,7075				COPPER ALLOYS 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×3.82/D1
Feed(IPM)=RPM x Fz x T(Flute)

FRACTIONAL 英制

Slot Milling 	ALUMINUM ALLOYS 2017,2024,356,6061,7075				COPPER ALLOYS 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×3.82/D1
Feed(IPM)=RPM x Fz x T(Flute)

Unit/單位: mm

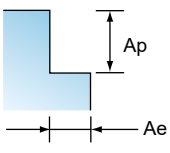
產 品 規格表 P255
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IPVE Series Side CUTTING 側面切削

FRACTIONAL 英制

Side Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦ 275			≦ 375			≦ 375			> 375 ≦ 475			> 475 ≦ 655		
HRC	≦ 28.5			≦ 39.8			≦ 39.8			> 39.8 ≦ 49.1			> 50 ≦ 65		
Vc (SFM)	555	(442-662)		315	(253-378)		405	(324-486)		210	(168-252)		90	(72-108)	
Ae/Ap	Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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	0.00010	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	0.00179	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	0.00231	29.4	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



Unit/單位: mm

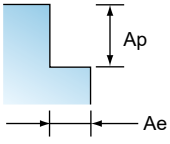
產 品 規格表 P255
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IPVE Series Side CUTTING 側面切削

FRACTIONAL 英制

SideMilling 	CAST IRONS LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 304, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦ 220			> 220 ≦ 260			≦ 275			≦ 275			≦ 325		
HRC	≦ 18.8			> 18.8 ≦ 26.6			≦ 28.5			≦ 28.5			≦ 34.4		
Vc (SFM)	355	(284-426)		340	(272-408)		490	(392-588)		340	(272-408)		310	(248-372)	
Ae/Ap	Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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	0.00013	1.5	2,610	0.00013	1.3
15/32	2,883	0.00225	25.9	2,748	0.00170	18.70	3,964	0.00170	27.0	2,748	0.00133	14.6	2,523	0.00133	13.4
31/64	2,790	0.00233	25.9	2,659	0.00175	18.60	3,837	0.00175	26.9	2,659	0.00136	14.5	2,441	0.00136	13.3
1/2	2,703	0.00240	25.9	2,576	0.00180	18.50	3,717	0.00180	26.8	2,576	0.00140	14.4	2,365	0.00140	13.2
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

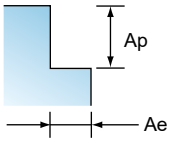


Unit/單位: mm

產 品 規格表 P255
Specification page

IPVE Series Side CUTTING 側面切削

FRACTIONAL 英制

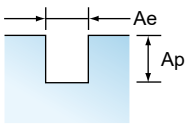
SideMilling 	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦ 300			> 300			≦ 350			> 350 ≦ 440		
HRC	≦ 32.1			≦ 32.1								
Vc (SFM)	80	(64-96)		62	(50-74)		215	(172-258)		75	(60-90)	
Ae/Ap	Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D			Ae=0.5D Ap=1.5D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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												

Unit/單位: mm

產 品 規格表 P255
Specification page

IPVE Series SLOT CUTTING 溝加工

FRACTIONAL 英制

Slot Milling	CARBON STEELS 1018, 1040, 1080, 1090, 10L50, 1140, 1212, 12L15, 1525, 1536			ALLOY STEELS 4140, 4150, 4320, 5120, 5150, 8630, 86L20, 50100			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2			TOOL STEELS A2, D2, H13, L2, M2, P20, S7, T15, W2		
Hardness BRINELL	≦ 275			≦ 375			≦ 375			> 375 ≦ 475			> 475 ≦ 655		
HRC	≦ 28.5			≦ 39.8			≦ 39.8			> 39.8 ≦ 49.1			> 50 ≦ 65		
Vc (SFM)	440	(352-528)		252	(201-303)		320	(256-384)		170	(136-204)		70	(56-84)	
Ae/Ap	Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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	0.00010	1.0	1,081	0.00005	0.2
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	0.00179	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	0.00231	23.6	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															

Unit/單位: mm

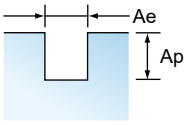
產 品 規格表 P255
Specification page

IPVE Series SLOT CUTTING 溝加工

FRACTIONAL 英制

Slot Milling	CAST IRONS (LOW&MEDIUM ALLOY) Gray, Malleable, Ductile			CAST IRONS (HIGH ALLOY) Gray, Malleable, Ductile			STAINLESS STEELS (FREE MACHINING) 304, 416,420F,430F,440F			STAINLESS STEELS (DIFFICULT) 304, 304L,316,316L			STAINLESS STEELS(PH) 13-8 PH,15-5PH,17-4PH, Custom 450		
Hardness BRINELL	≦ 220			> 220 ≦ 260			≦ 275			≦ 275			≦ 325		
HRC	≦ 18.8			> 18.8 ≦ 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 Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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	0.00013	0.9	1,670	0.00013	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

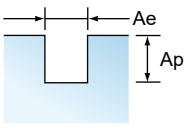


Unit/單位: mm

產 品 規格表 P255
Specification page

IPVE Series SLOT CUTTING 溝加工

FRACTIONAL 英制

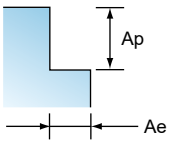
Slot Milling 	SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 601,617,625,Incoly 800,Monel 400			SUPER ALLOYS (NICKEL,COBALT,IRON,BASE) Inconel 718,750X,Incoly 925,Waspalloy,Hastelloy,Rene			TITANIUM ALLOYS Pure Ttanium, Ti6Al4V, Ti6Al2Sn4Zr2Mo, Ti4Al4Mo2Sn0.5Si			TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3 Cr3Sn3Al		
Hardness BRINELL	≦ 300			> 300			≦ 350			> 350 ≦ 440		
HRC	≦ 32.1			≦ 32.1								
Vc (SFM)	65	(52-78)		50	(40-60)		170	(136-204)		60	(48-72)	
Ae/Ap	Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D			Ae=1D Ap=1D		
MILL DIA. (inch)	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 4 Flutes	RPM	Fz	Feed (IPM) 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												

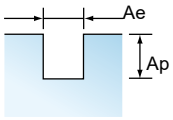
Unit/單位: mm

產品規格表 P256
Specification page

IPVR1T Series Cutting Conditions 標準切削

FRACTIONAL 英制

type	IPVR1T		
Side Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦ 300		
HRC	≦ 31		
Vc (SFM)	60		
Ae/Ap	Ae=0.4D 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 切削量基準			

type	IPVR1T		
Slot Milling 	TITANIUM ALLOYS (DIFFICULT) Ti10Al2Fe3Al, Ti5Al5V5Mo3Cr, Ti7Al4Mo, Ti3Al8V6Cr4Zr4Mo, Ti6Al6V6Sn, Ti15V3		
Hardness BRINELL	≦ 300		
HRC	≦ 31		
Vc (SFM)	60		
Ae/Ap	Ae=1D 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 切削量基準			

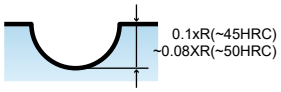
Unit/單位: mm

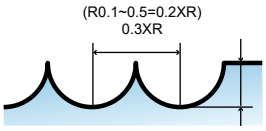
產品規格表 P269
Specification page

● SBS 4 Flutes Standard Cutting Conditons 標準切削

WORK MATERIAL 被切削材	Carbon Steels S50C 碳素鋼		Alloy Steels Prehardened Steels SCM SKD HPM NAK 合金鋼、調質鋼		Hardened Steels SKD61~HRC50 調質鋼		Aluminum 鋁		Copper 銅	
Cutting Speed 切削速度	150m/min		120~150m/min		80~100m/min		150~m/min		100~150m/min	
R	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 進給速度	SPEED (min^{-1}) 迴轉速	Feed Rate (mm/min) 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 加工深度

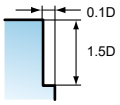
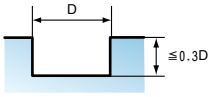
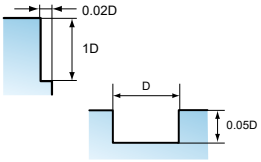




Unit/單位: mm

產 品 規格表 P270
Specification page

• RTAS 2 Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Carbon Steels, Alloy Steels S50C,SCM,鑄鐵FC250等 AiSi 1049, Cast iron 炭素鋼，合金鋼~HRC30			Alloy Steels, Tool Steels 調質鋼SKD61, NAK等 Prehardened steels, AiSi H13 合金鋼、工具鋼、預硬鋼 HRC30~45			Austenitic stainless steels SUS304, SUS316等 AiSi 304, AiSi 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61, SKD11, NAK, STAVAX等 AiSi H13 熱處理鋼 (HRC45~50)		
Cutting Speed 切削速度	50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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 (D:直徑Dia) 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 被削材	Carbon Steels, Alloy Steels S50C,SCM,鑄鐵FC250等 AiSi 1049, Castiron 炭素鋼，合金鋼~HRC30		Alloy Steels, Tool Steels 調質鋼SKD61, NAK等 Prehardened steels, AiSi H13 合金鋼、工具鋼、預硬鋼 HRC30~45		Hardened steels SKD61, SKD11, NAK, STAVAX等 AiSi H13 熱處理鋼 HRC45~55	
Cutting Speed 切削速度	250m/min		150m/min		100m/min	
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度
8	9900	1290	6000	750	4000	220
10	7900	1100	4800	650	3200	200
12	6600	1000	4000	560	2600	200
(mm) Ap Milling Amount 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.

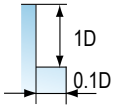
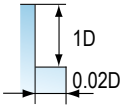
▲ 注意事項

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。

Unit/單位: mm

產品規格表 P270
Specification page

● RTAS 4 Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Carbon Steels, Alloy Steels S50C,SCM,鑄鐵FC250等 AiSi 1049, Cast iron 炭素鋼，合金鋼~HRC30			HRC30~45 Alloy Steels, Tool Steels 調質鋼SKD61, NAK等 Prehardened steels, AiSi H13 合金鋼、工具鋼、預硬鋼			Austenitic stainless steels SUS304, SUS316等 AiSi 304, AiSi 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61, SKD11, NAK, STAVAX等 AiSi H13 熱處理鋼 (HRC45~50)			Hardened steels SKD11, 等 AiSi D2 熱處理鋼 HRC55~60		
Cutting Speed 切削速度	50~100m/min			50~70m/min			30~60m/min			20~40m/min			15~30m/min		
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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 (D:直徑Dia) 切削量基準	側面Side Milling 									側面Side Milling 					

產品規格表 P270
Specification page

● RTAS 4 Flutes High-Speed Milling Conditions 高速標準切削

Work material 被削材	Carbon Steels, Alloy Steels S50C,SCM,鑄鐵 FC250等 AiSi 1049, Castiron 炭素鋼，合金鋼~HRC30		Alloy Steel, Tool Steel 預硬鋼, SKD61, NAK等 Pre-hardnad steel AiSi H13 合金鋼，工具鋼 HRC30~45		Hardened steels SKD61, SKD11, NAK, STAVAX等 AiSi H13 熱處理鋼 HRC45~55		Hardened steels SKD11等AiSi D2 熱處理鋼 HRC55~60	
Cutting Speed 切削速度	300m/min		200m/min		150m/min		50m/min	
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度
8	11900	2325	7900	1485	5900	470	2000	175
10	9500	2000	6300	1290	4700	410	1600	160
12	7900	1800	5300	1125	3900	360	1300	135
(mm) Ap Milling Amount 軸方向 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。

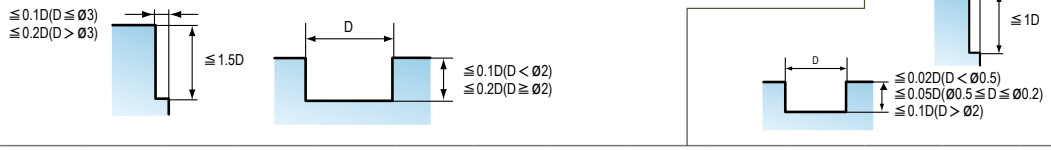
Unit/單位: mm

產品規格表 P271
Specification page

● SES 2Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Copper 銅			Carbon Steel, Alloy Steel S50C,SCM,鑄鐵FC250等 AISI 1049,Cast iron 炭素鋼，合金鋼~HRC30			HRC30~45 Alloy Steels, Tool Steels 調質鋼SKD61,NAK等 Prehardened steels, AISI H13 合金鋼、工具鋼、預硬鋼			Austenitic stainless steels SUS304, SUS316等 AISI 304,AISI 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61,SKD11,NAK,STAVAX 等AISI H13 熱處理鋼 (HRC45~50)		
Cutting Speed 切削速度	80~150m/min			50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Diameter 直徑(mm)	Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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

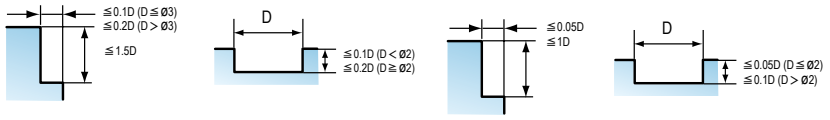


產品規格表 P271
Specification page

● SES 4Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Carbon Steels, Alloy Steels S50C, SCM, 鑄鐵FC250等 AISI 1049, Cast iron 炭素鋼，合金鋼~HRC30			HRC30~45 Alloy Steels, Tool Steels 調質鋼SKD61, NAK等 Prehardened steels, AiSi H13 合金鋼、工具鋼、預硬鋼			Austenitic stainless steels SUS304, SUS316等 AISI 304, AiSi 316 沃斯田鐵系列不鏽鋼			Hardened steels SKD61, SKD11, NAK, STAVAX等 AiSi H13 熱處理鋼 (HRC45~50)		
Cutting Speed 切削速度	50~100m/min			50~70m/min			30~60m/min			20~40m/min		
Diameter 直徑(mm)	Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度		Speed (min⁻¹) 迴轉數	Feed Rate (mm/min) 進給速度	
		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 溝		Side Milling 側面	Slotting 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

1.In cutting Austenitic stainless steels, the use of non-water-soluble cutting fluid is especially effective.
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.When drilling, please set the feed rate at 1/3 or below of the above value.

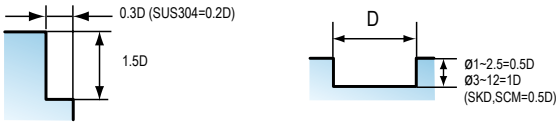
▲ 注意事項

1.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。
2.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。
3.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 P272
Specification page

● PES 3Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Carbon Steels S50C 炭素鋼				Alloy Tool Steels, SCM, SKD 合金工具鋼				Stainless Steels, Titanium Alloys SUS304, SUS316等 不鏽鋼,鈦合金				Prehardened Steels, HPM, NAK 調質鋼~HRC40			
Cutting Speed 切削速度	~100m/min				~50m/min				~35m/min				~56m/min			
Diameter 直徑(mm)	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度			Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度		
		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 縱向		Side Milling 側面	Slotting 溝	Drilling 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 (D:直徑Dia) 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.

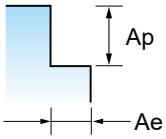
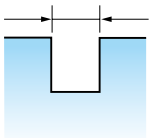
▲ 注意事項

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，請降低回轉速及進給速度。
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。

Unit/單位: mm

產品規格表 P273
Specification page

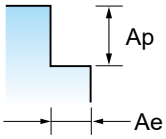
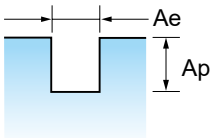
• AES5 2 Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Aluminum 1070 鋁				Aluminum Alloy 2017.5052.7075 鋁合金				Aluminum Alloy Cast AC8C 鍛造鋁			
Cutting Speed 切削速度	300m/min		220m/min		330m/min		240m/min		250m/min		160m/min	
Diameter 直徑(mm)	Side Milling 側面		Slotting 溝		Side Milling 側面		Slotting 溝		Side Milling 側面		Slotting 溝	
	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 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 (D:直徑Dia) 切削量基準	 Ap ≦ 0.5D Ae ≦ 0.2D				 Ap ≦ 0.5D							

Unit/單位: mm

產品規格表 P273
Specification page

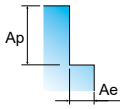
• AES5 3 Flutes Standard Cutting Conditions 標準切削

Work material 被削材	Aluminum 1070 鋁				Aluminum Alloy 2017.5052.7075 鋁合金				Aluminum Alloy Cast AC8C 鍛造鋁			
Cutting Speed 切削速度	300m/min		220m/min		330m/min		240m/min		250m/min		160m/min	
Diameter 直徑(mm)	Side Milling 側面		Slotting 溝		Side Milling 側面		Slotting 溝		Side Milling 側面		Slotting 溝	
	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/min) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 進給速度	Speed (min^{-1}) 迴轉數	Feed Rate (mm/in) 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 (D:直徑Dia) 切削量基準	 Ap ≦ 0.5D Ae ≦ 0.2D				 Ap ≦ 0.5D							

Unit/單位: mm

產品規格表 P274
Specification page

• FHPCS 4 Flutes Side Milling 側面切削

Work material 被削材	Mild steels Carbon steels, Cast iron SS400, S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels,Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 切削速度	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
Mill DIA.(mm) 直徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed(mm/min) 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 加工深度												

Ap	Ae
1.5D	0.2D

Ap	Ae
1.5D	0.1D

Ap	Ae
1D	0.05D

產品規格表 P274
Specification page

• FHPCS 4 Flutes Slotting 溝切削

Work material 被削材	Mild steels Carbon steels, Cast iron SS400, S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels,Stainless steels SUS304, SKD 調質鋼 HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼 HRC45~55		Hardened steels, 調質鋼 HRC55~60	
Cutting Speed 切削速度	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
Mill DIA.(mm) 直徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度	 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

Unit/單位: mm

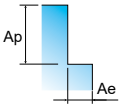
產 品 規格表 P274
Specification page

• 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 被削材	Mild steels Carbon steels, Cast iron SS400, S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		合金鋼、工具鋼 Alloy steels, Tool steels, SCM, SKT,SKS,SKD ~HRC30		調質鋼 HRC30~38 Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1		調質鋼 HRC38~45 Hardened steels,Stainless steels SUS304, SKD		調質鋼 HRC45~55 Hardened steels, Titanium alloys, Heat resistant alloys steels,		調質鋼 HRC55~60 Hardened steels,	
Cutting Speed 切削速度	100m/min		78m/min		66m/min		62m/min		60m/min		30m/min	
Mill DIA.(mm) 直徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度



	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

▲ 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失。

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 被削材	Mild steels Carbon steels, Cast iron SS400,S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels,Stainless steels SUS304, SKD 調質鋼 HRC38~45	
Cutting Speed 切削速度	100m/min		78m/min		66m/min		62m/min	
Mill DIA.(mm) 直徑	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 送速度	Speed(mm^{-1}) 迴轉速度	Speed (mm/min) 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 加工深度



Ap=0.2D
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.

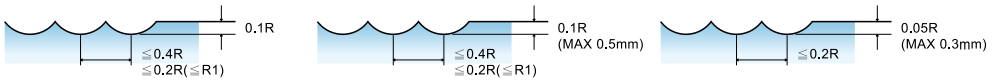
▲ 注意事項

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

Unit/單位: mm

產品規格表 P275
Specification page

• KTGS 2 Flutes Standard Cutting Conditions 標準標準切削

Work material 被削材	Alloy steels, Tool steels, Prehardened steels, SCM, SKD61, SKD11, NAK, AISI H3 ,AISI D2 ect. 合金鋼、工具鋼、預硬鋼 ~HRC45					Hardened steels, SKD61, SKD11, STAVAX, AISI H13 ect. 調質鋼 HRC45~55				Hardened steels, SKD11, SKH, SKS, ASP23, AISI H13 ect. 調質鋼 HRC55~62			
R (mm) 球頭半徑	Inclination of Machining Surface 加工面傾斜角	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	切削量 (mm)		Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	切削量 (mm)		Speed (min^{-1}) 迴轉速度	Feed (mm/min) 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	α ≦15°	40000	3120	≦0.2R	≦0.1R	35000	2340	≦0.2R	≦0.1R	21000	1300	≦0.2R	≦0.05R
	α >15°	35000	2080	≦0.2R	≦0.1R	30000	1430	≦0.2R	≦0.1R	15000	740	≦0.2R	≦0.05R
D0.75R	α ≦15°	40000	3900	≦0.2R	≦0.1R	30000	2470	≦0.2R	≦0.1R	14000	1160	≦0.2R	≦0.05R
	α >15°	30000	2210	≦0.4R	≦0.1R	25000	1560	≦0.4R	≦0.1R	10000	610	≦0.2R	≦0.05R
D1R	α ≦15°	35000	3900	≦0.4R	≦0.1R	25000	2340	≦0.4R	≦0.1R	11000	1040	≦0.2R	≦0.05R
	α >15°	25000	2210	≦0.4R	≦0.1R	20000	1430	≦0.4R	≦0.1R	8000	560	≦0.2R	≦0.05R
D1.25R	α ≦15°	33000	3900	≦0.4R	≦0.1R	22000	2210	≦0.4R	≦0.1R	9300	920	≦0.2R	≦0.05R
	α >15°	24000	2210	≦0.4R	≦0.1R	17000	1300	≦0.4R	≦0.1R	6500	480	≦0.2R	≦0.05R
D1.5R	α ≦15°	30000	3900	≦0.4R	≦0.1R	20000	2210	≦0.4R	≦0.1R	8000	870	≦0.2R	≦0.05R
	α >15°	23000	2210	≦0.4R	≦0.1R	15000	1300	≦0.4R	≦0.1R	5600	450	≦0.2R	≦0.05R
D2R	α ≦15°	25000	3900	≦0.4R	≦0.1R	17000	2210	≦0.4R	≦0.1R	6400	830	≦0.2R	≦0.05R
	α >15°	20000	2210	≦0.4R	≦0.1R	13000	1300	≦0.4R	≦0.1R	4500	440	≦0.2R	≦0.05R
D2.5R	α ≦15°	23000	3900	≦0.4R	≦0.1R	15000	2210	≦0.4R	≦0.1R	5000	710	≦0.2R	≦0.05R
	α >15°	17000	2210	≦0.4R	≦0.1R	11000	1300	≦0.4R	≦0.1R	3500	380	≦0.2R	≦0.05R
D3R	α ≦15°	20000	3900	≦0.4R	≦0.1R	13000	2210	≦0.4R	≦0.1R	4200	690	≦0.2R	≦0.05R
	α >15°	15000	2210	≦0.4R	≦0.1R	10000	1300	≦0.4R	≦0.1R	2900	350	≦0.2R	≦0.05R
D4R	α ≦15°	15000	3900	≦0.4R	≦0.1R	10000	2210	≦0.4R	≦0.1R	3200	700	≦0.2R	≦0.05R
	α >15°	11000	2210	≦0.4R	≦0.1R	7500	1300	≦0.4R	≦0.1R	2200	360	≦0.2R	≦0.05R
D5R	α ≦15°	12000	3770	≦0.4R	≦0.1R	8000	2080	≦0.4R	≦0.1R	2500	660	≦0.2R	≦0.05R
	α >15°	9000	2080	≦0.4R	≦0.1R	6000	1170	≦0.4R	≦0.1R	1800	350	≦0.2R	≦0.05R
D6R	α ≦15°	10000	3250	≦0.4R	≦0.1R	6600	1820	≦0.4R	≦0.1R	2100	570	≦0.2R	≦0.05R
	α >15°	7500	1820	≦0.4R	≦0.1R	5000	1040	≦0.4R	≦0.1R	1500	300	≦0.2R	≦0.05R
Depth of cut 加工深度													

▲ Caution

1. α 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 revolutin and the feed rate propotionately.
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 incerased.

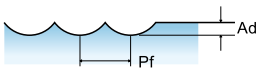
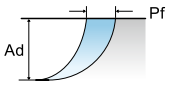
▲ 注意事項

1. α 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。

Unit/單位: mm

產品規格表 P275
Specification page

• KTGS 2 Flutes High Speed Milling Conditions 高速標準切削

Work material 被削材	Alloy steels, Tool steels, Prehardened steels, SCM, SKD61, SKD11, NAK, AISI H3 ,AISI D2 ect. 合金鋼、工具鋼、預硬鋼 ~HRC45					Hardened steels, SKD61, SKD11, STAVAX, AISI H13 ect. 調質鋼 HRC45~55				Hardened steels, SKD11, SKH, SKS, ASP23, AISI H13 ect. 調質鋼 HRC55~62			
R (mm) 球頭半徑	Cutting Way 加工方式	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	切削量 (mm)		Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	切削量 (mm)		Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	切削量 (mm)	
				Pf Pick feed	Ad Milling Amount			Pf Pick feed	Ad Milling Amount			Pf Pick feed	Ad 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 加工深度													

▲ Caution

1. α 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 revolutin and the feed rate propotionately.
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 incerased.

▲ 注意事項

1. α 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。

Unit/單位: mm

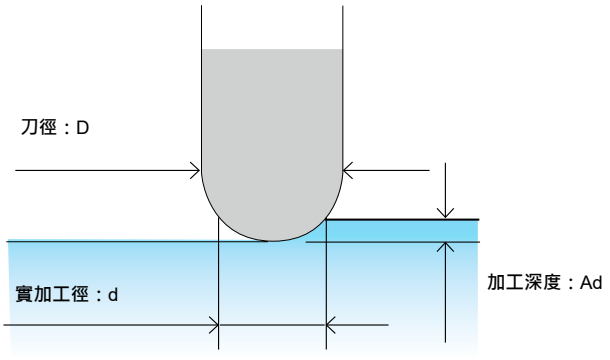
產品規格表 P275
Specification page

• KTGS 2 Flutes Ball End Milling Actual Diameter 球型銑刀實際加工直徑速查表

R R半徑	D 刀徑	Depth of cut (mm) 加工深度														
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

Caculation of Actual Dia

$$d=2\sqrt{Ad\,(D-Ad)}$$



Unit/單位: mm

產品規格表 P276
Specification page

• KCRS 4 Flutes High Speed Milling Conditions 高速標準切削

Work material 被削材	Mild steels arbom steels, Cast iron SS400, S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		Alloy steels, Tool steels, SCM, KT,SKS,SKD ~HRC30 合金鋼、工具鋼		Hardened steels, Prehardened steels, (Free-cutting) SKT, SKD, NAK55, HPM1 調質鋼HRC30~38		Hardened steels, Stainless steels US304, SKD 調質鋼HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼HRC45~55		Hardened steels, 調質鋼HRC55~60	
Mill DIA. (mm) 直徑	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度
D10×R2	6030	13300	6030	12060	6030	12060	4510	9070	4510	8170	3040	3610
D11×R2	5510	12060	5510	11020	5510	11020	4130	8260	4130	7410	2750	3320
D12×R3	5030	13300	5030	12060	5030	12060	3800	9070	3800	8170	2520	3610
D13×R3	4650	12250	4650	11210	4650	11210	3460	8360	3460	7550	2330	3370

加工深度 Depth of cut



a_a	a_r
0.1 x R	0.3D

	a_a	a_r
R≦2	0.1 x R	0.3D
2＜R	0.2mm	0.3D

	a_a	a_r
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（β）≦2°.
6.These Milling conditions are for a tool extension length：less than 4×D. 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（β）≦2° 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4×D。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吵雜聲。

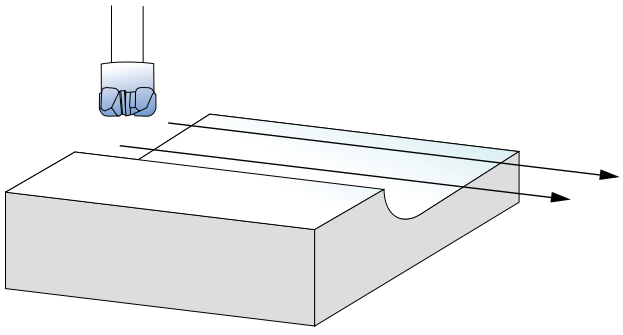
Tool extension coefficients 工具突出量係數

Overshank Length 工具突出量	Milling Speed 切削速度	a_a 軸方向切削	Feed Speed 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。



Unit/單位: mm

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 被削材	Mild steels Carbon steels, Cast iron SS400, S55c, FC250 (~750N/mm2) 一般構造用鋼、碳素鋼、鑄鐵		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		Hardened steels, Stainless steels SUS304, SKD 調質鋼HRC38~45		Hardened steels, Titanium alloys, Heat resistant alloys steels, 調質鋼HRC45~55		Hardened steels, 調質鋼HRC55~60	
Mill DIA. (mm) 直徑	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度	Speed (min^{-1}) 迴轉速度	Feed (mm/min) 進給速度
D8×R2	3800	6650	3800	6030	3040	4840	2660	4230	1900	2710	1140	1090
D9×R2	3370	5890	3370	5370	2710	4320	2370	3750	1660	2420	1000	950
D10×R2	3040	6650	3040	6030	2420	4840	2140	4230	1520	2710	910	1090
D11×R2	2750	6030	2750	5510	2180	4420	1950	3840	1380	2470	830	1000
D12×R3	2520	6650	2520	6030	2000	4840	1760	4230	1280	2710	750	1090
D13×R3	2330	6130	2330	5600	1850	4460	1610	3900	1140	2520	700	1000

加工深度 Depth of cut



	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.

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 (β) ≦2° .
6.These Milling conditions are for a tool extension length：less than 4×D. For a longer tool extension, reduce the speed, feed rate, and the cutting depth in accordance with therespective coefficients, to prevent chattering.

▲ 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.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（β）≦2° 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4×D。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吵雜聲。

Tool extension coefficients 工具突出量係數

Overshank Length 工具突出量	Milling Speed 切削速度	aa 軸方向切削	Feed Speed 進給速度
L/D≦4	100	100	100
L/D≦5	80~100	70~90	80~90
L/D≦6	60~80	50~70	60~80

Unit/單位: mm

產品規格表 P288
Specification page

• RD Cutting Condition 切削條件表

Work Material 加工材質	Hardness 硬度	Cutting Speed 切削速度	Feed 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 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 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 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 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 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 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 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.

Unit/單位: mm

產品規格表 P295
Specification page

• WRH Cutting Condition
切削條件表

Work Material 加工材質	Hardness 硬度	Cutting Speed 切削速度	Feed per Tooth 進給 fz(mm /tooth)						
			Diameter 直徑 ØD (mm)						
		(m/min)	10	12	16	20	25	30	32
Carbon Steel 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 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 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 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 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 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 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 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 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 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 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

$$N = \frac{V \times 1000}{\pi \times De} \ (min)^{-1}$$

$$De = 2 \times \sqrt{Ap \times (D - Ap)} \ (mm)$$

進給
Feed rate

$$F = N \times f_z \ (mm/min)$$

$$f_z = h_{max.} \times \frac{D}{\sqrt{Ap \times (D - Ap)}} \ (mm/rev)$$

N = 轉速 $(min)^{-1}$
Rotation speed

V = 切削速度 (mm/min)
Cutting speed

De = 有效刀具直徑 (mm)
Cutting length of diameter

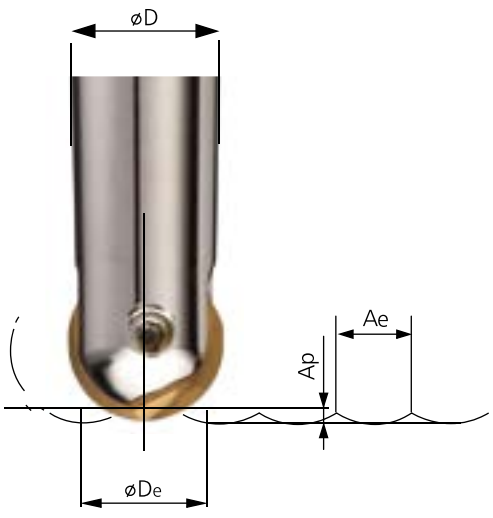
Ap = 軸向切深 (mm)
Depth of cut (ap)

Ae = 步距/徑向切深 (mm)
Depth of cut (ae)

F = 進給速度 (mm/min)
Feed rate

f_z = 每轉進給 (mm/rev)
Feed rate of rotation speed

h_{max} = 有效刀具直徑 (mm/min)
Cutting length of diameter



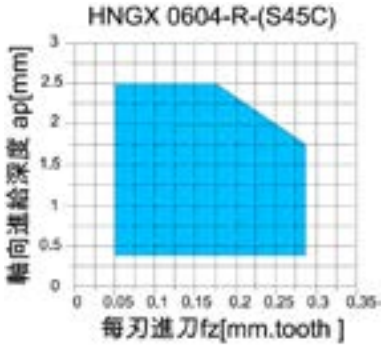
Unit/單位: mm

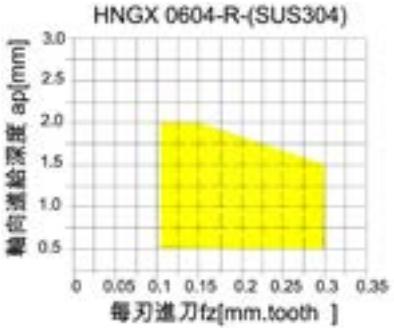
產品規格表 P302
Specification page

• HN Cutting Condition
切削條件表

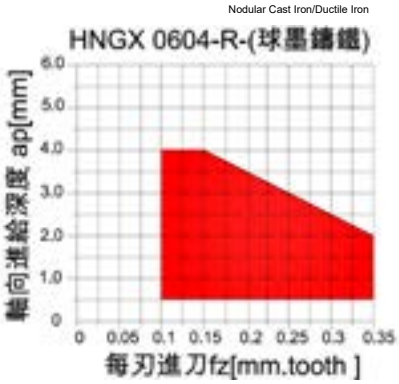
HNGX

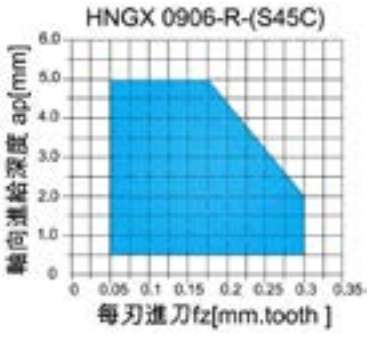
Item Code 規格碼	Cutting Condition 切削條件參數		ISO Standard for Carbide Tools (Application Range) ISO碳化物切削刀具標準(適用切削材料範圍)		
			P	M	K
HNGX0604-R-4225	每刃進給(Fz)	[mm/tooth]	0.05 ~ 0.27	0.1 ~ 0.3	0.1~0.35
	軸向進刀量(Ap)	[mm]	0.5~2.5	0.5~ 2.0	0.5 ~ 4
	切削速度(Vc)	[m/min]	200 ~250	60 ~ 100	135 ~ 182
HNGX0906-R-4225	每刃進給(Fz)	[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

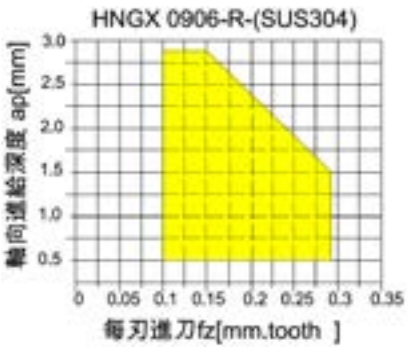




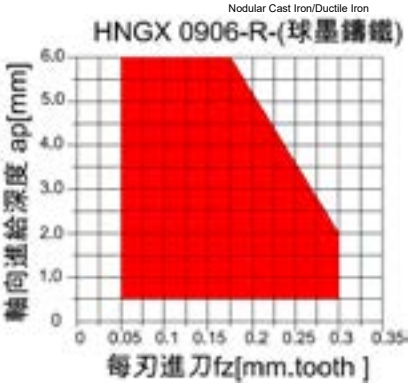
Nodular Cast Iron/Ductile Iron







Nodular Cast Iron/Ductile Iron



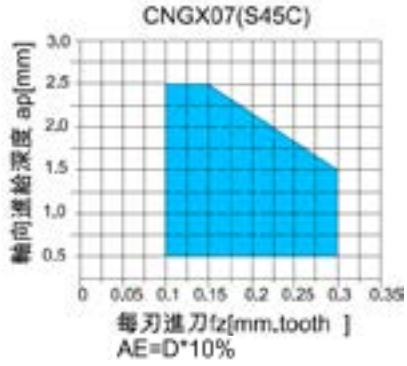
Unit/單位: mm

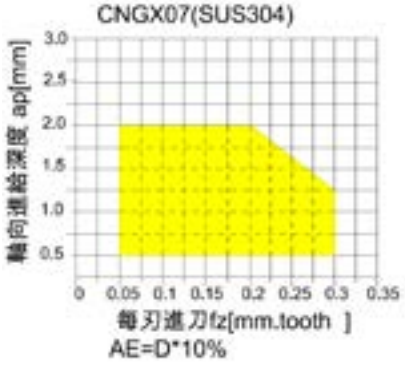
產品規格表 P308
Specification page

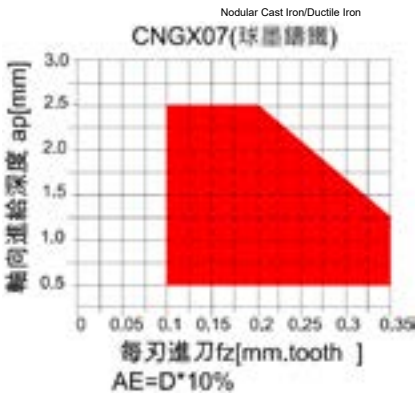
• CN Cutting Condition
切削條件表

CNGX

Item Code 規格碼	Cutting Condition 切削條件參數		ISO Standard for Carbide Tools (Application Range) 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







Unit/單位: mm

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 被削材	Mild steels, Carbon steels, cast iron		Alloy steels, Tool steels, SCM, SKT, SKS, SKD ~HRC30		鑄鐵 FC250等 一般構造鋼, 碳素鋼		Aluminum alloy, expanding material	
Diameter 直徑 (mm)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (mm/min)	Speed 迴轉速 (min^{-1})	Feed Rate 進給速度 (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

Unit/單位: mm

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 Work Material	一般構造用鋼 Structural Steels SS400	炭素鋼 Carbon Steels S45C, S50C	鑄鐵、合金鋼 Cast Iron, Alloy Steels FC, FCD, SCM, SKD	調質鋼 Hardened Steels		不鏽鋼 Stainless Steels SUS304
				HRC30~40	~HRC50	
切削速度 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 Dia. (mm)	Removal Amount (mm/Dia.)	Feed (mm/rev)	Feed (mm/rev)	Feed (mm/rev)	Feed (mm/rev)	Feed (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

Unit/單位: mm

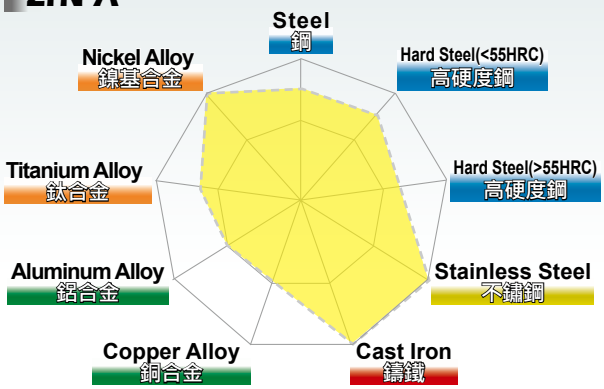
Note

■ Coating Classifying and advantage 立銑刀的塗層種類及特點 end mill expert

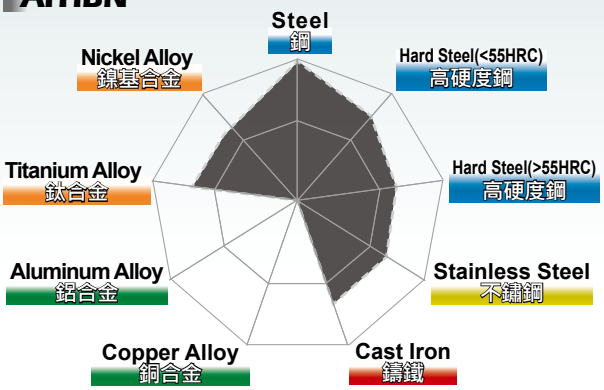
項目 Item	塗層種類 Coating type	ALTIBN	TiSiN	ZrN-A	ZrN-S	nACo	TiSiN+	P-nACo	nACro	SH (AlTiSiN)	SS (AlTiCrN)	RS (CrsSiN)	TB
特性 Characteristic	表面硬度 (HV) Hardness(HV)	~3400	~3600	~3400	~3600	45(Gpa)	~3600	47(Gpa)	42(Gpa)	3600	3300	~2800	>6000
	塗層厚度 (μm) Thickness(μm)	2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4	2~4	<1
	耐氧化溫度 (℃) Oxidation Temp.(℃)	900	1100	900	1100	1200	1100	1200	1100	1200	900	1000	500
	摩擦係數 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 Color	黑 Black	棕 Copper	金 Golden	金 Golden	藍 Blue	棕 Copper	藍 Blue	銀灰 Gray	金 Golden	銀 Sliver	銀 Sliver	金屬黑 Black
適用材質 Application	碳鋼 Carbon Steel	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	X
	工具高速鋼 High Speed Steel	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	◎	X
	不鏽鋼 Stainless Steel	○	○	◎	◎	○	○	○	◎	○	◎	◎	X
	合金 Alloy	◎	◎	◎	◎	◎	◎	◎	◎	◎	○	○	X
	銅 / 鋁 Copper /Aluminum	X	X	X	X	X	X	X	○	X	X	○	◎
	高溫合金 Inconel	◎	◎	◎	◎	◎	◎	◎	○	◎	○	○	X
	鈦合金 Titanium	○	○	◎	◎	○	○	○	○	○	○	○	◎
	塑膠 / 複合材料 / 木材 / 紙 Plastic / Composites / Wood / Paper	X	X	X	X	X	X	X	X	X	X	X	◎
切削方式 Cutting Way	乾式 Dry Cutting	◎	◎	◎	◎	○	◎	○	◎	○	○	◎	○
	濕式 Wet Cutting	○	○	○	○	○	○	○	◎	○	◎	◎	◎
	油霧 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

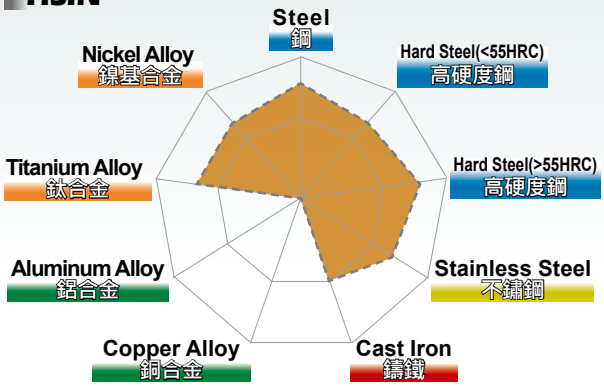
ZrN-A



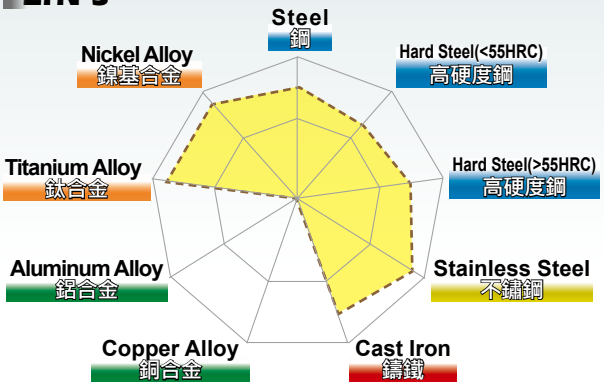
AlTiBN



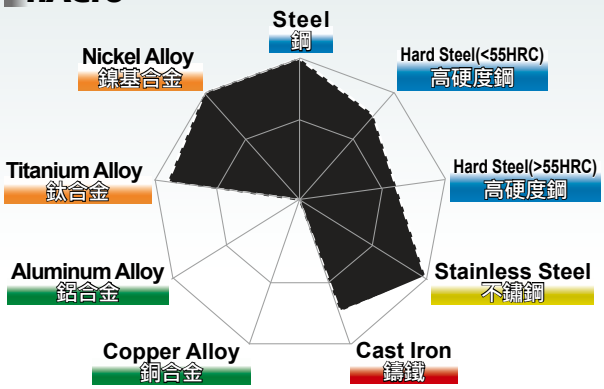
TiSiN



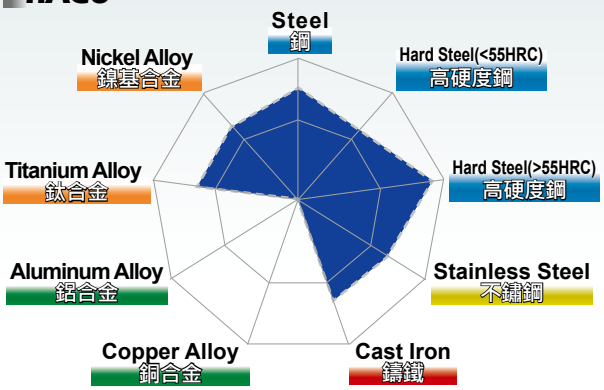
ZrN-S



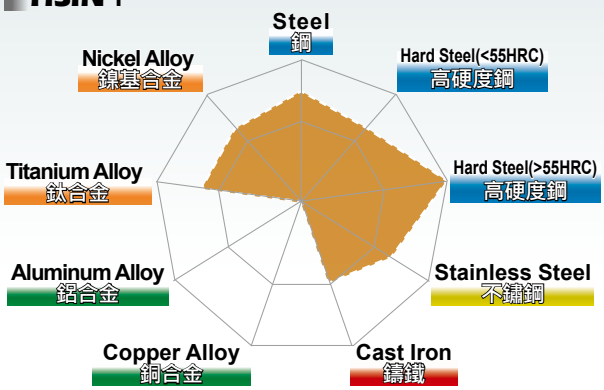
nACro



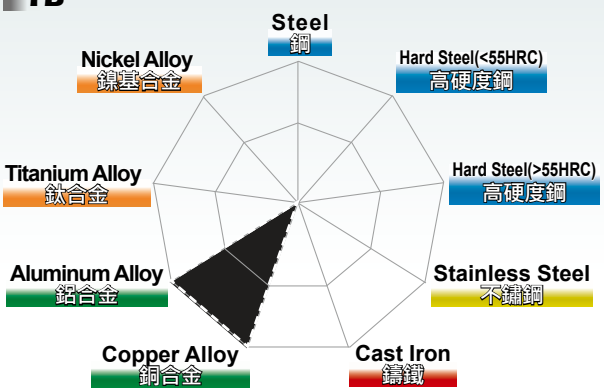
nACo



TiSiN+

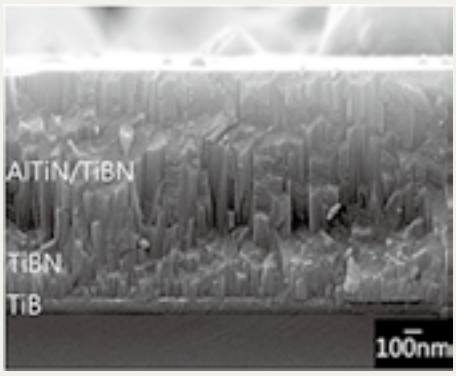


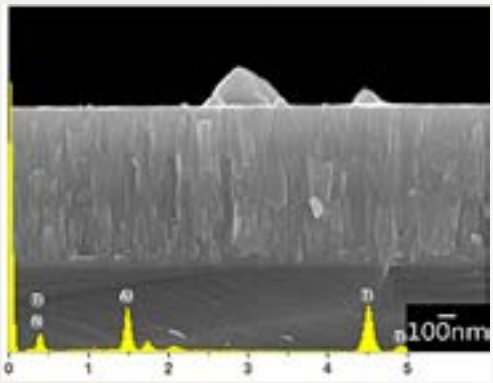
TB



Introduction of AlTiBN Coating
AlTiBN 塗層介紹

Coating Structural Analysis-SEM 薄膜結構分析-SEM



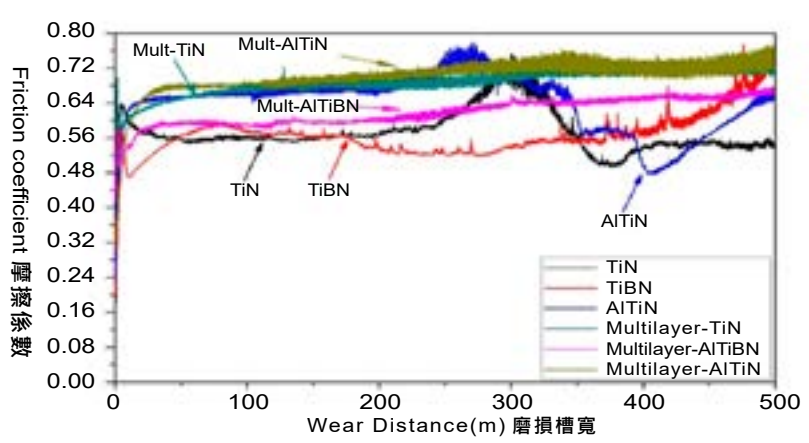


Normal Temperature - Mechanical Analysis 常溫-機械分析

	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℃ 700℃的氧化磨耗



	Friction Coefficient 摩擦係數	Wear Distance 磨損槽寬	Wear rate 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

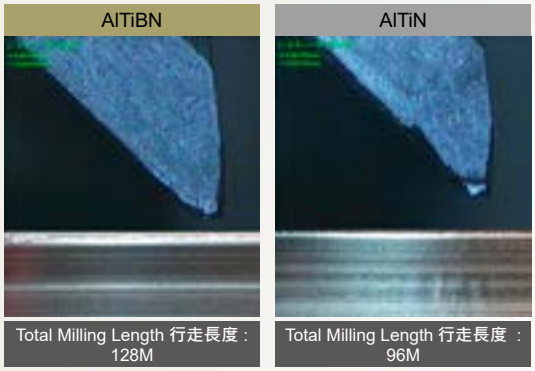
The wear rate of AlTiBN at high temperatures is also superior to the above coatings.
AlTiBN 在高溫下的磨損率優於上述其它塗層

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

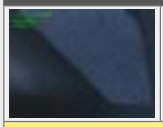
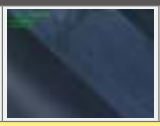
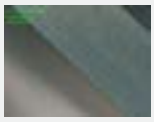
- Suitable for High Speed machining with both dry and wet cutting way.
  用於乾濕式高速機加工

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)

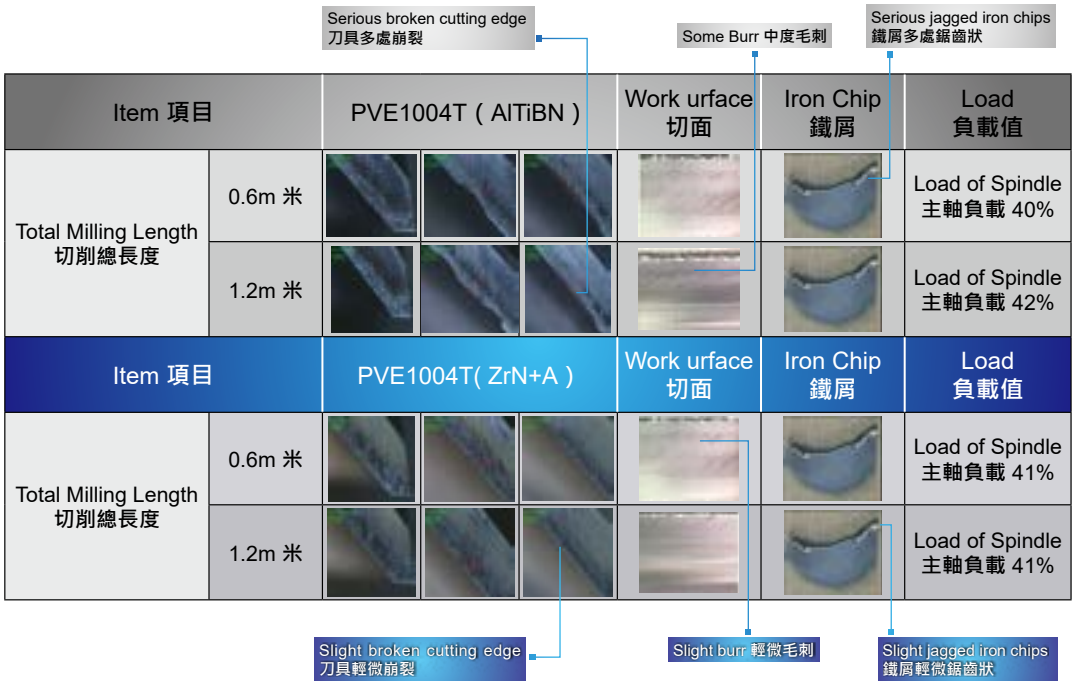
實測比較 - SUS316開槽

PVE1004(AlTiBN) 塗層優化加 ZrN 測試比較

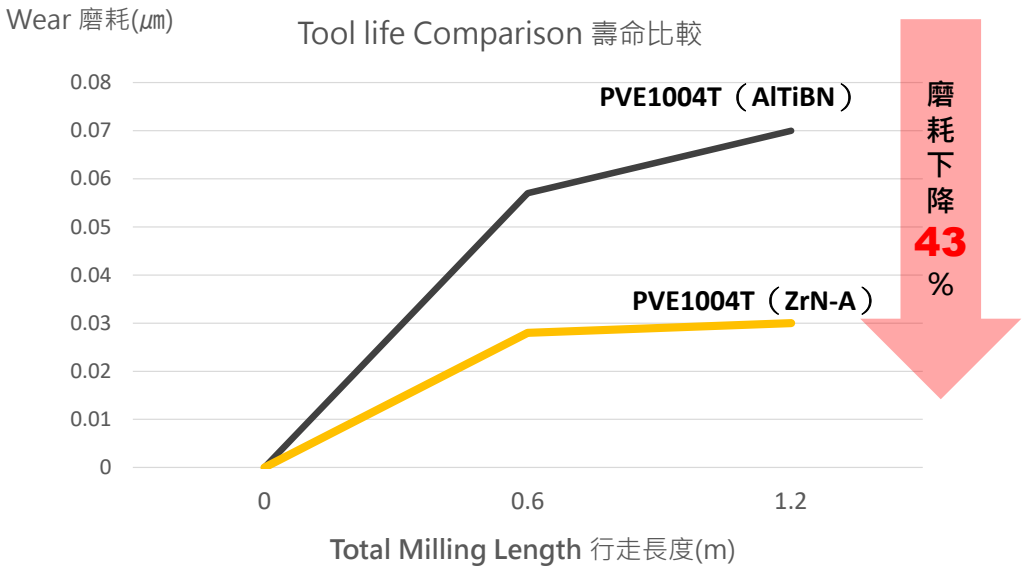
	PVE1004T (AlTiBN)		
刀具使用前			
	PVE1004T (ZrN-A)		
			

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%



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 Total Milling Length 行走長度 (m)	0.6m	1.2m
ALTIBN	0.057 μ m	0.07 μ m
ZrN-A	0.028 μ m	0.03 μ m

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℃, 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.

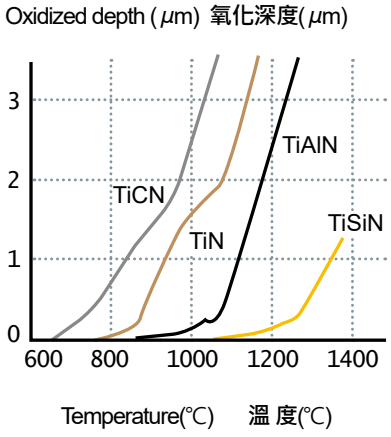
Newly developed TiSiN Coating has excellent oxidation-resistant properties, this achieves：
High speed cutting of hard steels = High Efficiency
Improvement in tool life = Lower tooling costs The newly designed flute geometry increases rigidity, with the improved high radius accuracy producing higher tolerance, and smoother surface finish.
Direct Milling of hardened steel is now possible = Faster production times.

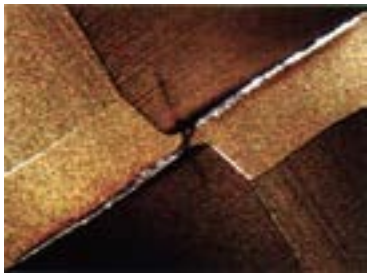


Patent of Taiwan No: I 280288
(the method of tool surface hardening)
本產品已獲台灣一種刀具表面硬化方法之專利證書字號：I 280288

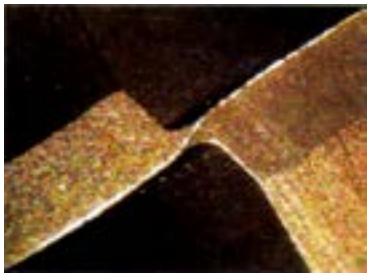
塗層介紹

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℃）
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

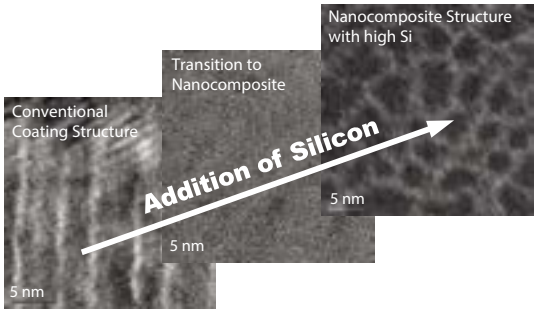
nACRo Nanocomposite coating process. nACRo 奈米制程

1. contain Si membrane, oxidation start temperature : 1,100℃.
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.

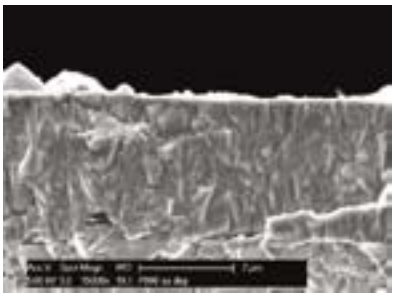
含矽薄膜，切削氧化溫度高達1100℃。
奈米級塗層，表面更加細緻。
超高硬度，超高附著力。
多層陶瓷結構，保護性更佳性，切削更環保，更節省成本。

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 nanocrystallineTiAlN- or AlCrN-grains become embedded in theamorphous SiN-matrix and the nano-composite structure develops.

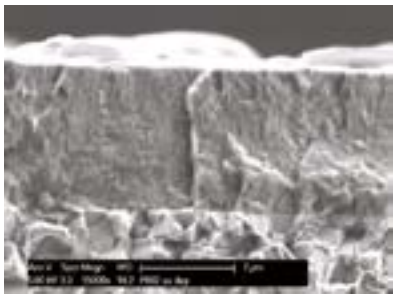
Silicon increases the thoughness and decreases the internal residual stress of the coating.
The increasing of the hardness is generated by the structure only, the SiN matrix enwraps the hard grains and avoids growing of their size.



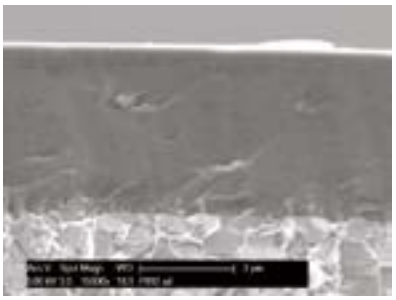
不含矽: AlCrN
No Silicon: AlCrN



低含矽: AlCrN / SiN
Low Silicon: AlCrN / SiN

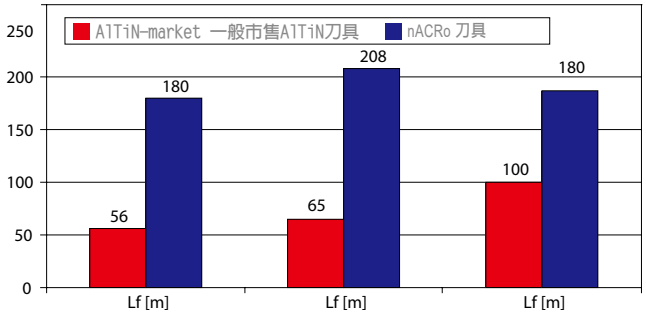


高含矽: nACRo
High Silicon: nACRo





Tool Life Comparison 刀具使用壽命比較



Carbide End Mills Ø10mm, z=4, steel 34CrNiMo6 (30 HRC), Coolant: Air; Minimum lubrication - Tested tools: 2x4
Source: Carmex, Maalot, ISR

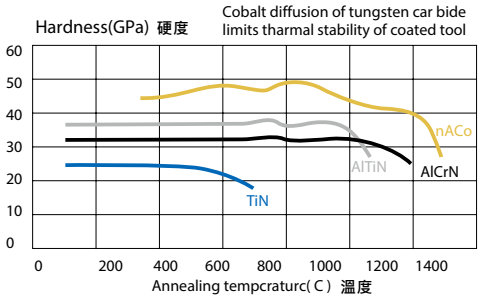
nACRo Coating Technical Data

nACo Nanocomposite coating process. nACo奈米制程

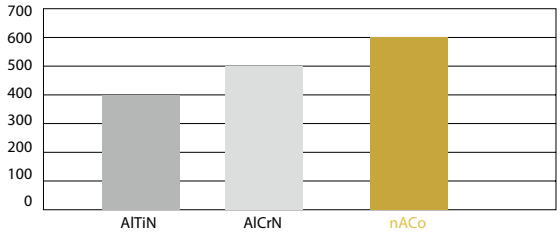
1. Perfect coating structure.
2. High hardness.
3. High adhesion.
4. Adding Si into nACo structure makes atom structuremore completed with high hard-wearing and tools with more longer life.

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



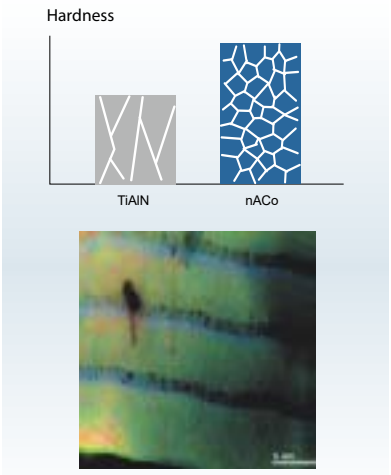
Tool Life Comparison 刀具壽命比較



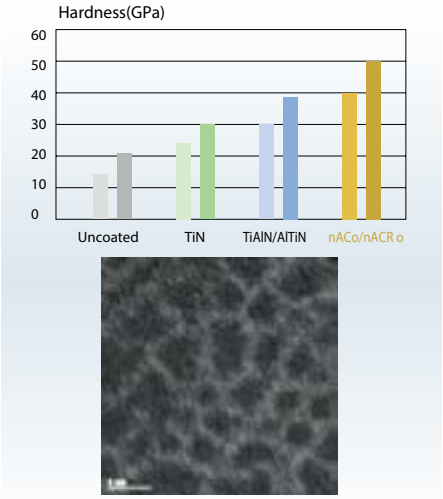
AlTiN v.s nACo 的比較

S.T Coating	Typical Thickness(£g) 膜厚	Nanohardness up to (GPa) 硬度	Max Service Temp(¢J) 氧化溫度	Friction coefficient 摩擦係數
AlTiN	2~4	35	800	0.6
nACo	2~4	45	1200	0.35

Hardness Increase through Nanocomposites



Conbentional 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

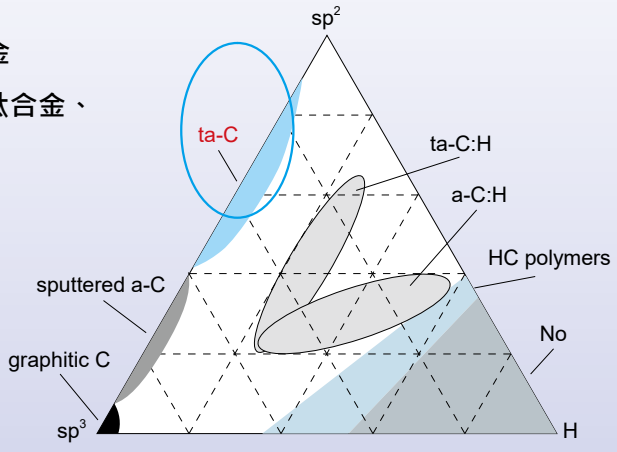
Tetrabond Diamond Coating TB超硬類鑽膜

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，有效的降低摩擦系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。



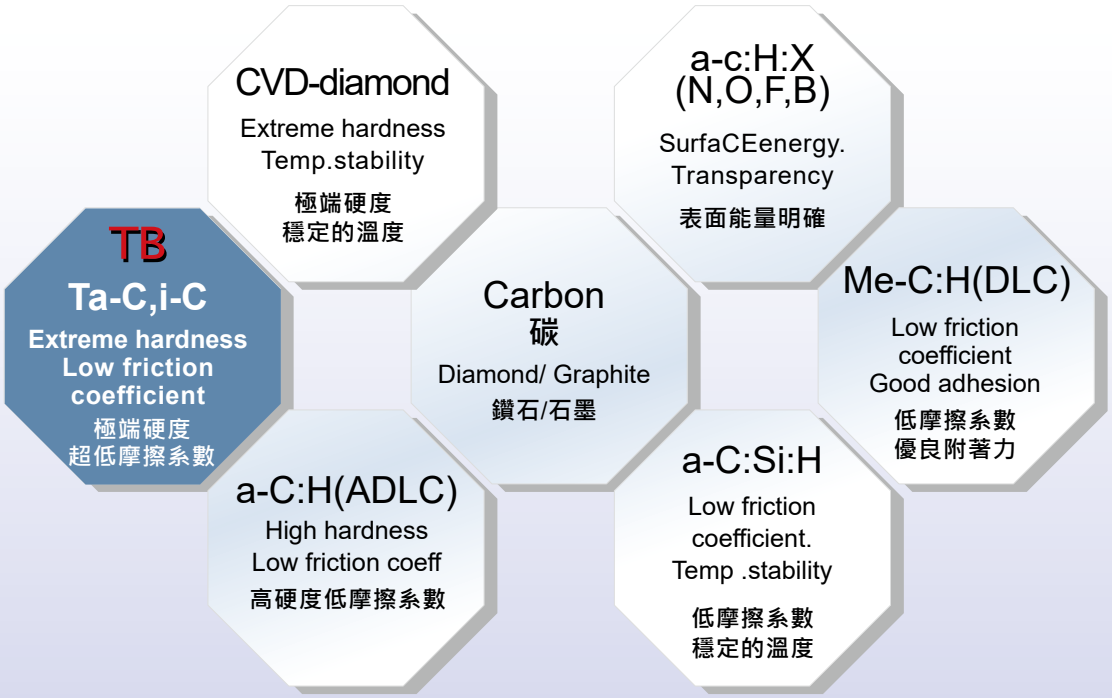
TB Coating

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	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

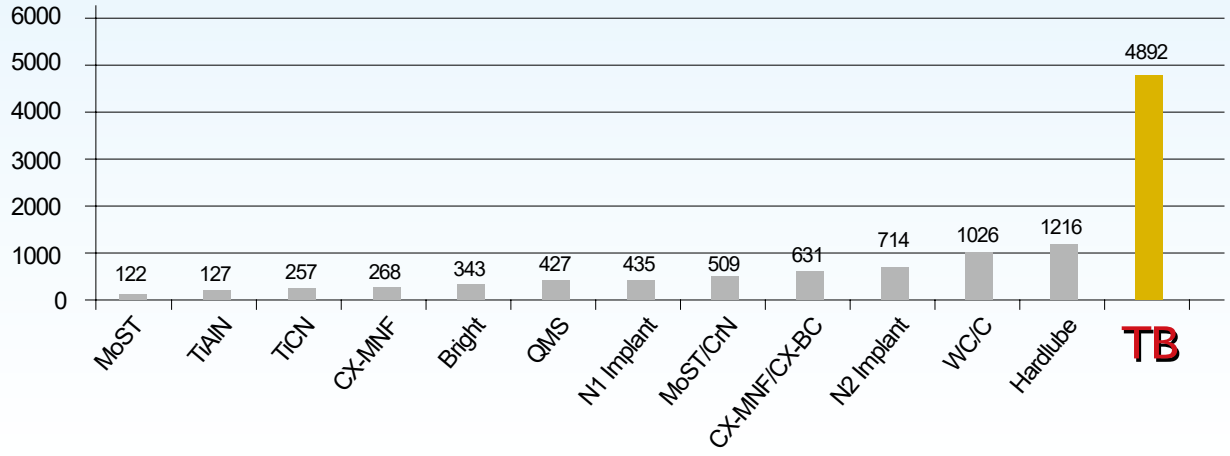


TB Coating Technical Data

Performance and cost savings - Dry Drilling
節省成本和高性能－乾式鑽孔

TB exhibits outstanding performance in machining aluminum!*
TB塗層在加工鋁件有著優異的表現

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



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

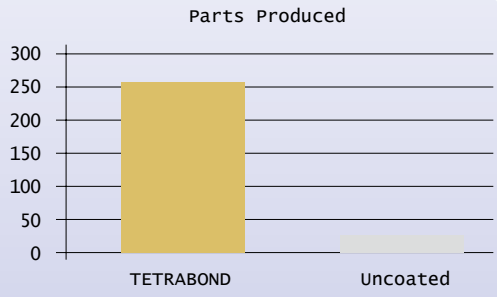
Higher Speeds & Feeds 高轉速和高進給	→	Improve productivity 增加生產效率
Reduced Tool Inventory 減少庫存工具	→	Tool cost savings 降低工具成本
Longer Tool Life 較長的工具壽命	→	Reduced downtime 減少停機時間
Improved Part Quality 精良的工件品質	→	Less scrap 較少的毛邊

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℃
- 硬度 Hardness: 2,800HV
- 摩擦係數 Coefficient of friction : 0.3
- 薄膜厚度 Thickness (μ) : 2~4 μ
  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℃
- 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℃.

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

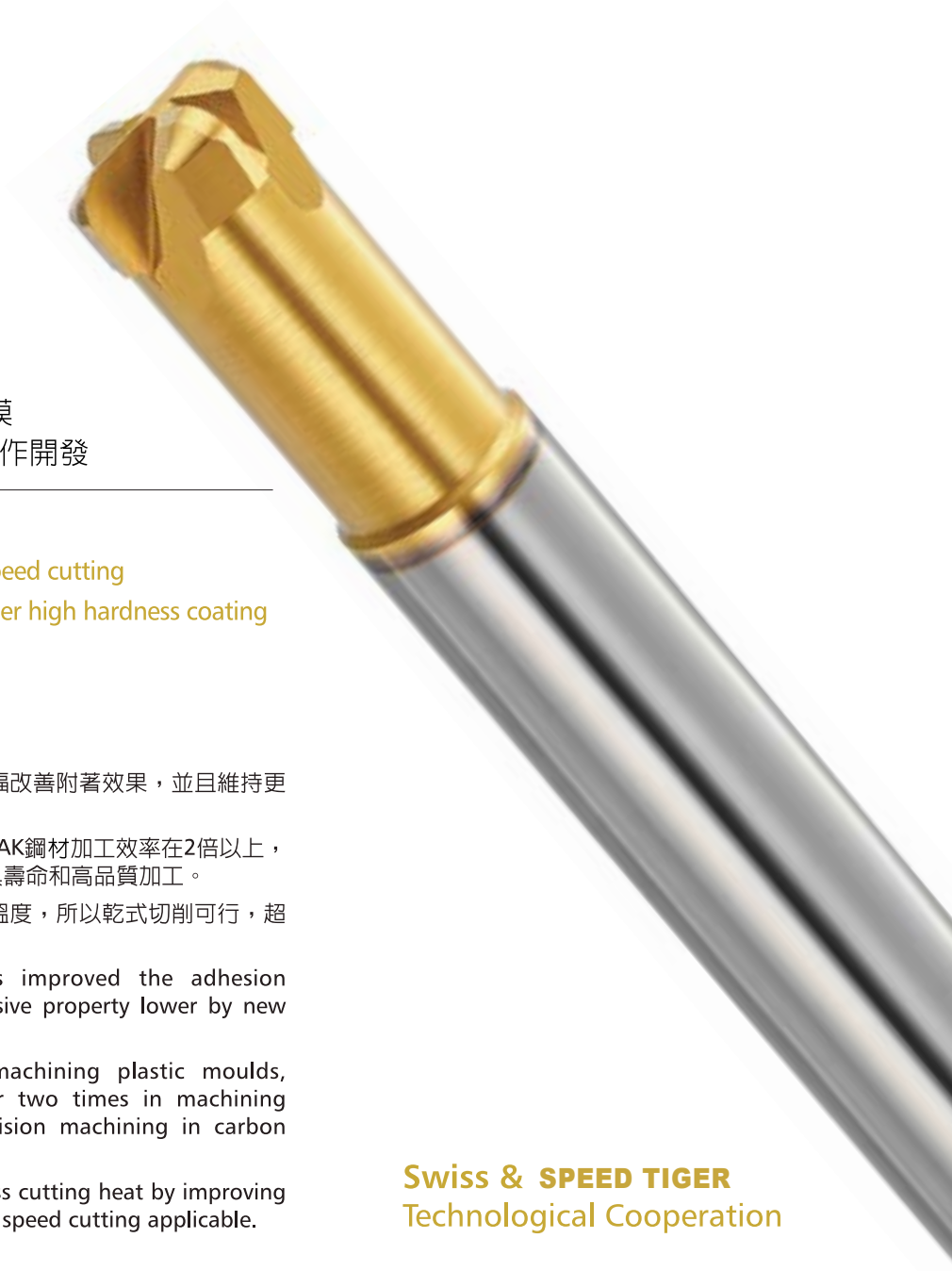
Rs塗層優點 Advantage of RS

- 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

COMPARISON OF CHIP FORMATION



Coating	Material System	Application	Typical Thickness (μ)	Hardness (HV)	Oxidation Temp. (°C)	Coefficient of Friction	Color
AℓTiN SH	Multilayer NaNo	High speed machining, High Hardness	2~4	3600	1200	0.34	Golden
AℓTiN 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

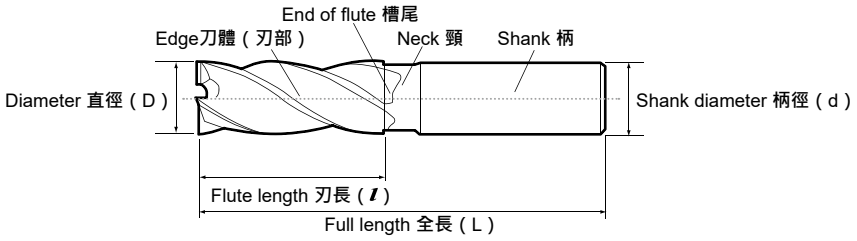
Improve quality

- Less scrap

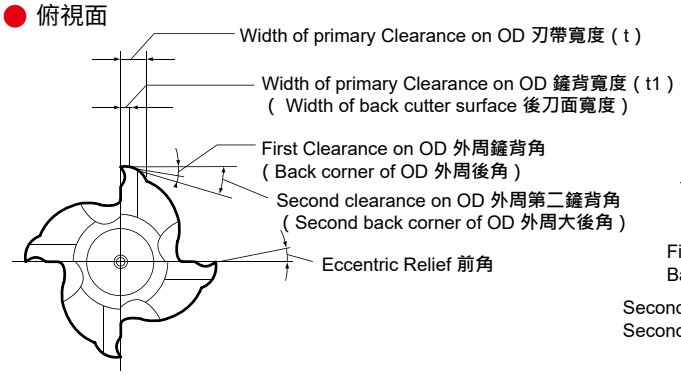


Detail of the end mill 立銑刀各部位名稱

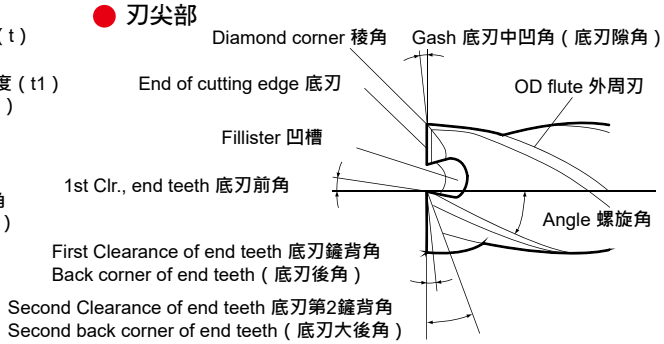
側視面



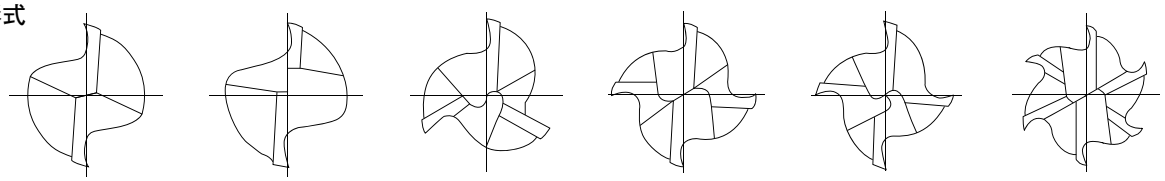
俯視面



刃尖部

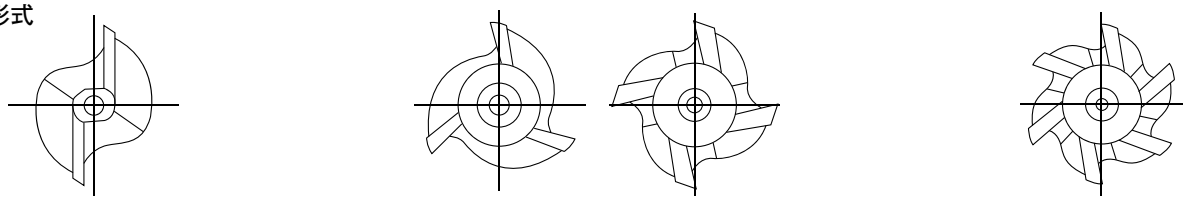


刀刃形式



2 flute 2刃 | 2 edge with double teeth 2刃（親子刃） | 3 flute 3刃 | 4 flute 4刃 | 4 edge with double teeth 4刃（親子刃） | 6 flute 6刃

刀刃形式



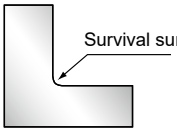
2 flute 2刃 | 3 flute 3刃 | 4 flute 4刃 | 6 flute 6刃

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

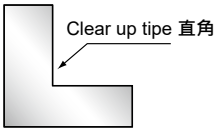


- Batter rigidity of the tip, protecting the edge. 尖角部剛性好，不易崩刃。
- Tip sharp drop. 尖角部鋒利度下降。

Tip 尖角



During the tip 尖角型時



- 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)
π = 3.14 (圓周率)
D = Diameter 立銑刀刃徑 (mm)
N = Rotating speed 轉速 (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，可通過下速公式求出。

$$N = \frac{1000 \times V}{\pi \times D}$$

N = Rotating speed 轉速 (min^{-1})
V = Cutting speed 切削速度 (m/min)
π = 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 (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 (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。

$$Tc = \frac{L}{F}$$

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+立銑刀刃逕D)
F = Feed rate 進給速度 (mm/min)

The standrad Cutting Conditions published on each products page.
Cutting will be influenced by work piece,machine and software; the above-mentioned date 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 posible ▶ Adjust the failed part of machine ▶ Reduce rotating speed ▶ Downcut ▶ Tools minimum lenght 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 ▶ Improve cutting roughness
		● Chip lump and fuse attach material	▶ Remove chip lump and fuse attach material ▶ 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)
		● Misfit cutting fluids or deficient of cutting fluids	▶ Change cutting fluids
	● Buckling cracking of the of machined surface	● Unbalance friction of cutting edge	▶ Regrinding to reduce friction
		● Fuse attach material on the cutting edge	▶ Remove fuse attach material ▶ Change cutting fluids
		● Cutting edge deformation	▶ To pay attention to use and safekeeping
	● The corrugation of machined surface	● 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
		● A larger Helix Angle	▶ Decrease the Helix Angle
● Shape precision	● Perpendicularity	● 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
		● Perpendicularity of holder not reach	▶ Improve the perpendicularity of holder
● End mill life	● Shorter life for regrinding end mill	● Work material hardness too high	▶ Improve to suitable hardness by heat treatment process ▶ 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 ▶ Use suitable cutting liquid
		● Unsuitable cutting liquid	▶ Use suitable cutting liquid ▶ Use enough cutting liquid
	● Huge friction of cutting edge	● The fault of work material	▶ Uchieve the average of inSide form of work material ▶ 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 ▶ Adjust offer method of liquid
		● Unsuitable regrind schedule	▶ Manage the regrind schedule
	● Flute damage	● Vibration	▶ Strengthen the install tool of work material
		● The fault of work material	▶ Achieve the average of working material structure ▶ Use suitable hardness , clear up unbalance hardness ▶ Check the material may mix other hardness substance or gravel
		● Unsuitable feed rate	▶ Reduce the feed rate
		● Cutter become dull	▶ Regrind the tools
		● Cutting liquid go off	▶ Change the cutting liquid
	● Break	● Work material unsuitable fixed	▶ Indeed fix the work material ▶ 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

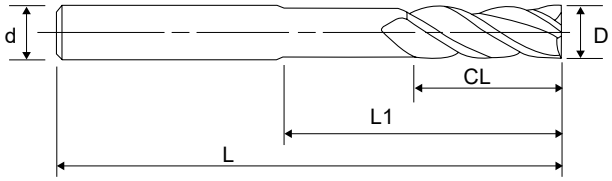
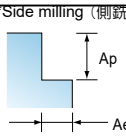
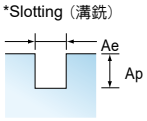
項目	故障	原因	對策
● 加工面精度	● 加工面較粗	● 振動、顫振	▶ 提高工件安裝剛性 ▶ 改正機械的不良部位 ▶ 降低立銑刀的轉速 ▶ 進行逆銑 ▶ 將立銑刀的刃長伸出長度控制在最小範圍
		● 加工工件的硬度不均一	▶ 測量硬度後進行選擇適合的刀具
		● 先端形狀不合適	▶ 採用合適的前角、後角 ▶ 改善磨削面的表面粗糙度
		● 有積屑瘤、熔附物	▶ 除去積屑瘤、熔附物 ▶ 檢查切削液的變質情況
		● 刃尖鈍化	▶ 確定適當的再研磨時期
		● 切削速度過快	▶ 減慢切削速度
		● 切削液不適、不足	▶ 改變切削液或供給方法
	● 加工面擠裂	● 切削刃的摩擦不均衡	▶ 通過再研磨除去摩擦
		● 刃部有熔附物	▶ 除去熔附物 ▶ 更換切削液
		● 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	▶ 熱處理為適合的硬度 ▶ 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
		● 進給量不適	▶ 改變為適合的進給量
		● 有積屑瘤、熔附物	▶ 除去積屑瘤、熔附物 ▶ 選擇合適的切削液
		● 切削液不適	▶ 選擇合適的切削液 ▶ 使用足量的切削液
	● 切削刃的摩擦過大	● 加工工件材料的缺陷	▶ 實現工件材料內部組織的平均化 ▶ 消除硬度不均
		● 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	▶ 變更為合適的切削液 ▶ 變換給油方式
		● 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	▶ 實現內部組織的平均化 ▶ 使用合適的硬度、消除硬度不均 ▶ 檢查是否有硬質異物、砂等混入材料
		● 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	▶ 確實固定加工工件 ▶ 改善安裝用具
		● 切削刃刃鈍化	▶ 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，其跟原為JIS Z 8413 和 Z 8483換算表。1MPa=1N/mm^2
● 表中括號()內的數值比較少用，僅提供參考。

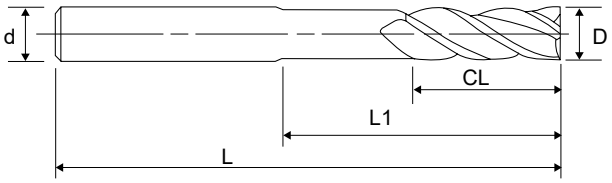
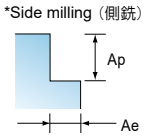
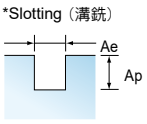
■ 硬度換算表 (SAE J 417) 根據洛氏硬度C標度而得之鋼的換算概值表 (1)

(HRC) 洛氏硬度 C級硬度	(HV) 維氏硬度	布氏硬度(HB)球體直徑荷重10mm導程荷重3000kgf		洛氏硬度 (3)			洛表面硬度 鑽石圓錐壓子			(Hs) 支柱硬度	拉伸強度 (進似值) MPa (kgf/mm2) (2)	洛氏硬度 C級硬度 (3)
		標準球	碳化鎢壓球	A標度 荷重：60kgf 鑽石圓錐壓子 (HRA)	B標度 荷重：100kgf 直徑1.6mm (HRB)	D標度 荷重：100kgf 鑽石圓錐壓子 (HRD)	15 - N級 荷重：15kgf	30 - N級 荷重：30kgf	45 - N級 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	☐HRC_____ ☐HB_____ ☐Other_____					
Type of Coating	☐ST standard(refer to our catalogue) ☐Uncoated ☐Customers Requirement _____					
Type of Flute Spiral	☐Right ☐Left					
No of Flutes	☐1 ☐2 ☐3 ☐4 ☐5 ☐6 ☐Other_____					
Type of End Cut		☐Square		☐Corner Radius r=_____		☐ Ball R=_____
Type of Shank	☐No Side Lock ☐Side Lock					
Specification						
	D_____ CL_____ L1_____ L_____ d_____					
Application	☐Side Milling	Common Side Milling				Ap:_____
		Cavity				Ae:_____
	☐Slotting					Ap:_____
	☐Drilling & Milling					Ae:_____
	Machine Processing		☐Finishing ☐Roughing ☐General Purpose ☐Other_____			
	Coolant Type		☐Soluble ☐Oil Coolant ☐Oil Mist ☐Dry Cutting ☐Air Cooling ☐Other_____			
	Tool Life Standard		☐Cutting Time ☐Load of Machine ☐Finish ☐Tool Wear ☐Vibration and Sound ☐Other_____			
	Desired Life					
	Finish Requirement		☐Required Roughness_____ ☐Not Required			
Other	Special Requirement					

訂製刀具需求表

<table>
<tr><td>工件材質</td><td colspan="5"></td></tr>
<tr><td>硬　　度</td><td colspan="5">☐HRC_____　☐HB_____　☐其他_____</td></tr>
<tr><td>塗　　層</td><td colspan="5">☐我司標準塗層(詳見目錄)　☐客戶指定塗層_____　☐不需塗層</td></tr>
<tr><td>螺旋類型</td><td colspan="5">☐右旋　☐左旋</td></tr>
<tr><td>刃　　數</td><td colspan="5">☐1　☐2　☐3　☐4　☐5　☐6　☐其他_____</td></tr>
<tr><td>底刃形狀</td><td></td><td>☐平刀</td><td></td><td>☐圓鼻刀圓弧角r=_____</td><td></td><td>☐球刀 半徑R=_____</td></tr>
<tr><td>柄部形狀</td><td colspan="5">☐無側固　☐需側固</td></tr>
<tr><td rowspan="2">各部尺寸</td><td colspan="5">
</td></tr>
<tr><td colspan="5">D_____ CL_____ L1_____ L_____ d_____</td></tr>
<tr><td rowspan="8">加工形式</td><td rowspan="2">☐側銑</td><td>普通側銑</td><td rowspan="2">
</td><td colspan="2">Ap:_____</td></tr>
<tr><td>腔銑</td><td colspan="2">Ae:_____</td></tr>
<tr><td colspan="2">☐槽銑</td><td rowspan="2">
</td><td colspan="2">Ap:_____</td></tr>
<tr><td colspan="2">☐鑽銑</td><td colspan="2">Ae:_____</td></tr>
<tr><td colspan="2">加工種類</td><td colspan="3">☐精加工　☐粗加工　☐通用加工　☐其他_____</td></tr>
<tr><td colspan="2">冷卻方式</td><td colspan="3">☐水冷　☐油冷　☐油霧
☐乾式　☐風冷　☐其他_____</td></tr>
<tr><td colspan="2">刀具壽命判定依據</td><td colspan="3">☐切削時間　☐機床負載　☐光潔度
☐刀具磨損　☐震動、聲音　☐其他_____</td></tr>
<tr><td colspan="2">刀具壽命要求</td><td colspan="3"></td></tr>
<tr><td colspan="2">工件表面
質量要求</td><td colspan="3">☐有要求 具體粗糙度值_____　☐無要求</td></tr>
<tr><td>其他要求</td><td colspan="2">(刀具材質、加工圖、特殊使用狀況)</td><td colspan="3"></td></tr>
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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

2025年03月出版