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Summary

Icon Guide 圖例說明



Ultra Micro Grain
超微晶粒



Shank
柄徑公差



Helix Angle
螺旋角度

Working Hardness
可被切削硬度 (值)

Standard 標準型







Deep Rib Processing 深溝加工型

Hardened 強力型

By Order 訂製品

Tools Level 分類	Tools Type 型式	Tools Specification 規格
MS2 / Page 10  Square 平刀 (Standard 標準品)		Regular Length, 2 Flute 二刃鑄鋼立銑刀 (D) Diameter 刃徑 / 0.1~20mm (l) Flute Length 刃長 / 0.2~40mm (L) Overall Length 全長 / 50~100mm (d) Shank Diameter 柄徑 / 4~20mm
MS4 / Page 14  Square 平刀 (Standard 標準品)		Regular Length, 4 Flute 四刃鑄鋼立銑刀 (D) Diameter 刃徑 / 1~25mm (l) Flute Length 刃長 / 2.5~45mm (L) Overall Length 全長 / 50~100mm (d) Shank Diameter 柄徑 / 4~25mm
XL2 / Page 12  Square 平刀 (Deep Rib Processing 深溝加工型)		For Deep Rib Processing, Long Neck, 2 Flute 二刃深溝加工鑄鋼立銑刀 (D) Diameter 刃徑 / 0.2~3mm (l) Flute Length 刃長 / 0.3~4.5mm (L) Overall Length 全長 / 50~60mm (l1) Effective Length 有效長 / 1~25mm (d) Shank Diameter 柄徑 / 4~6mm
XL4 / Page 15  Square 平刀 (Deep Rib Processing 深溝加工型)		For Deep Rib Processing, Long Neck, 4 Flute 四刃深溝加工鑄鋼立銑刀 (D) Diameter 刃徑 / 1~25mm (l) Flute Length 刃長 / 2.5~45mm (L) Overall Length 全長 / 50~100mm (d) Shank Diameter 柄徑 / 4~25mm
MS4P / Page 16  Square 平刀 (Hardened 強力型)		High Helix, For Hardened Material, 4 Flute 四刃高螺旋、高硬度鑄鋼立銑刀 (D) Diameter 刃徑 / 4~25mm (l) Flute Length 刃長 / 11~45mm (L) Overall Length 全長 / 50~100mm (d) Shank Diameter 柄徑 / 4~25mm
MS4PL / Page 17  Square 平刀 (Hardened 強力型)		High Helix, For Hardened Material, Long Shank, 4 Flute 四刃高螺旋、高硬度長柄鑄鋼立銑刀 (D) Diameter 刃徑 / 4~25mm (l) Flute Length 刃長 / 11~45mm (L) Overall Length 全長 / 75~200mm (d) Shank Diameter 柄徑 / 4~25mm
MS6P / Page 18  Square 平刀 (Hardened 強力型)		High Helix, For Hardened Material, 6 Flute 六刃高螺旋、高硬度鑄鋼立銑刀 (D) Diameter 刃徑 / 3~25mm (l) Flute Length 刃長 / 8~45mm (L) Overall Length 全長 / 50~100mm (d) Shank Diameter 柄徑 / 6~25mm

Summary

Tools Level 分類	Tools Type 型式	Tools Specification 規格
MS2R / Page 19  Corner Radius 圓鼻刀 (Standard 標準品)		Corner Radius, 2 Flute 二刃鑄鋼圓鼻刀 (D) Diameter 刃徑 / 1~12mm (R) Corner Radius R角 / R0.2~R2mm (I) Flute Length 刃長 / 2~24mm (L) Overall Length 全長 / 50~75mm (d) Shank Diameter 柄徑 / 4~12mm
MS4R / Page 22  Corner Radius 圓鼻刀 (Standard 標準品)		Corner Radius, 4 Flute 四刃鑄鋼圓鼻刀 (D) Diameter 刃徑 / 3~12mm (R) Corner Radius R角 / R0.2~R2mm (I) Flute Length 刃長 / 3~12mm (I1) Effective Length 有效長 / 10~36mm (L) Overall Length 全長 / 50~75mm (d) Shank Diameter 柄徑 / 6~12mm
XL2R / Page 20  Corner Radius 圓鼻刀 (Deep Rib Processing 深溝加工型)		Corner Radius, For Deep Rib Processing, Long Neck, 2 Flute 二刃深溝加工鑄鋼圓鼻刀 (D) Diameter 刃徑 / 1~6mm (I) Flute Length 刃長 / 1~6mm (I1) Effective Length 有效長 / 4~12mm (R) Corner Radius R角 / R0.1~R1mm (L) Overall Length 全長 / 50mm
XL4R (SS4R) / Page 23  Corner Radius 圓鼻刀 (Deep Rib Processing 深溝加工型)		Corner Radius, For Deep Rib Processing, 4 Flute 四刃深溝加工鑄鋼圓鼻刀 (D) Diameter 刃徑 / 3~12mm (R) Corner Radius R角 / R0.2~R2mm (I) Flute Length 刃長 / 3~12mm (I1) Effective Length 有效長 / 10~36mm (d) Shank Diameter 柄徑 / 6~12mm (L) Overall Length 全長 / 50~75mm
XL6R (SS6R) / Page 24  Corner Radius 圓鼻刀 (Deep Rib Processing 深溝加工型)		Corner Radius, For Deep Rib Processing and Hardened Material, 6 Flute 六刃深溝加工高硬度鑄鋼圓鼻刀 (D) Diameter 刃徑 / 6~12mm (R) Corner Radius R角 / R0.5~R1mm (I) Flute Length 刃長 / 6~12mm (I1) Effective Length 有效長 / 18~36mm (L) Overall Length 全長 / 50~75mm (d) Shank Diameter 柄徑 / 6~12mm
SB2 / Page 25  Ball 球刀 (Standard 標準品)		Ball Nose, Long Shank, 2 Flute 二刃長柄鑄鋼球刀 (R) Radius(R) 球頭半徑 / R0.1~R12.5mm (D) Diameter 刃徑 / 0.2~25mm (I) Flute Length 刃長 / 0.2~35mm (L) Overall Length 全長 / 50~150mm (d) Shank Diameter 柄徑 / 4~25mm
SB2L / Page 26  Ball 球刀 (Standard 標準品)		Ball Nose, For Hardened Material, 2 Flute 二刃高硬度加工鑄鋼球刀 (R) Radius(R) 球頭半徑 / R1~R12.5mm (D) Diameter 刃徑 / 2~25mm (I) Flute Length 刃長 / 3~35mm (L) Overall Length 全長 / 75~200mm (d) Shank Diameter 柄徑 / 4~25mm
XLB2 / Page 28  Ball 球刀 (Deep Rib Processing 深溝加工型)		Ball Nose, For Deep Rib Processing, Long Neck, 2 Flute 二刃深溝加工鑄鋼球刀 (R) Radius(R) 球頭半徑 / R0.2~R2mm (I) Flute Length 刃長 / 0.7~4mm (I1) Effective Length 有效長 / 2~30mm (d) Shank Diameter 柄徑 / 4~6mm (D) Diameter 刃徑 / 0.4~4mm (L) Overall Length 全長 / 50~75mm

Summary

Tools Level 分類	Tools Type 型式	Tools Specification 規格
SB2P / Page 27  Ball 球刀 (Hardened 強力型)	 	Ball Nose, For Hardened Material, 2 Flute 二刃高硬度加工銼鋼球刀 (R) Radius(R) 球頭半徑 / R0.15~R12.5mm (L) Overall Length 全長 / 50~150mm (D) Diameter 刃徑 / 0.3~25mm (d) Shank Diameter 柄徑 / 6~20mm (I) Flute Length 刃長 / 0.3~35mm (f) Effective Length 有效長 / 0.6mm
2HA / Page 30  Aluminum Alloy 鋁合金 (Standard 標準品)	 	For Aluminum Alloy, 2 Flute 鋁合金專用二刃銼鋼立銼刀 (D) Diameter 刃徑 / 1~12mm (I) Flute Length 刃長 / 3~32mm (L) Overall Length 全長 / 50~75mm (d) Shank Diameter 柄徑 / 4~12mm
3HA / Page 31  Aluminum Alloy 鋁合金 (Standard 標準品)	 	For Aluminum Alloy, 3 Flute 鋁合金專用三刃銼鋼立銼刀 (D) Diameter 刃徑 / 1~12mm (I) Flute Length 刃長 / 3~32mm (L) Overall Length 全長 / 50~75mm (d) Shank Diameter 柄徑 / 4~12mm
ESD / Page 32  Drill 鑽頭 (By Order 訂製品)	 	Carbide Drills 短刃銼刀柄鑽頭 (D) Diameter 鑽頭直徑 / 1~20mm (I) Flute Length 刃長 / 10~70mm (L) Overall Length 全長 / 40~150mm (d) Shank Diameter 柄徑 / 3~20mm
NCD / Page 34  Drill 鑽頭 (By Order 訂製品)	 	Carbide Spotting Drills 定位鑽頭 (D) Diameter 鑽頭直徑 / 2~10mm (I) Flute Length 刃長 / 6~22mm (L) Overall Length 全長 / 32~75mm (d) Shank Diameter 柄徑 / 2~10mm
Reamer / Page 35  Reamer 絞刀 (By Order 訂製品)	 	Solid Carbide Reamer 全銼鋼絞刀 (D) Diameter 鑽頭直徑 / 0.5~6.0mm (I) Flute Length 刃長 / 0.1~0.8mm (L) Overall Length 全長 / 50mm (d) Shank Diameter 柄徑 / 3~6mm Number of Flutes 刃數 / 4&6
Blank / Page 09  Blank 棒料 (By Order 訂製品)	 	Blank Type 棒料 (D) Diameter 刃徑 / 2~20mm (I) Flute Length 刃長 / 3~40mm (L) Overall Length 全長 / 34~200mm (d) Shank Diameter 柄徑 / 2~20mm
TM / Page 62  Thread Milling 銼牙刀 (Standard 標準品)	 	Thread Milling 單刃銼牙刀 (P) Pitch 螺距 / 0.25~1.25mm (D) Diameter 刃徑 / 4~6mm (Ø2) Diameter 刃徑 / 0.7~6.5mm (L) Overall Length 全長 / 50mm
TM3 / Page 63  Thread Milling 銼牙刀 (Standard 標準品)	 	Thread Milling, 3 Flute 單刃銼牙刀 (P) Pitch 螺距 / 0.25~1.25mm (D) Diameter 刃徑 / 4~6mm (Ø2) Diameter 刃徑 / 0.7~6.5mm (L) Overall Length 全長 / 50mm

S Type



Patent	專利
America	美國
Germany	德國
Japan	日本
Taiwan	台灣
Korea	韓國
China	中國



Special Braze for New Design
新設計的特殊焊接技術

Material Savings
節省材料 降低成本

Guarantee the Tip is New Material.
Tip 保證採用全新的材料

Bottom-up Recognition for TOPGREEN
特殊內孔 產品識別

For Mass Production
大規模自動化生產

	New 新式	Now Existing 目前市售	
	New Design Carbide+Carbide 新型設計 鎢鋼+鎢鋼	Carbide+SUS 鎢鋼+不銹鋼	Cut off / Fluting 切斷→開槽
Material Supply Chain 材料供應鏈	Good 佳	Common 普通	Bad 不佳
Material Quality 材料品質	New 新材料 / Stable 穩定	Recycle / Unstable 回收/不穩定	Recycle / Unstable 回收/不穩定
New Braze Design 新型設計焊接技術	Y 是	N 無	N 無
Braze Max Dia. to $\phi 30$ 焊接最大直徑	Y 是	$\phi 20\text{mm}\downarrow$	N/A 無
Material Savings for ECO System 節省材料的生態系統效益	High 高	Middle 中低	Middle 中低

Blank Type

Blank Type 棒料型式

(B) Composite Blank 複合式棒料		Disposable 一次性使用
(C) Solid Carbide 全鎢鋼		Disposable 一次性使用
(S) S Type of New Brazing 鎢鋼接鎢鋼		Re-change 可更換Tip



New Brazing Technology 新焊接技術

Re-change Change New Carbide Tip 可更換新的鎢鋼 Tip



- ▶ TOPGREEN makes Cutting Tools by Composite Blank that will reduce the production cost, and utilize material much more effectively and adequately.
 TOPGREEN 的複合式棒料所製造之切削工具，除了可以降低成本，更可有效地充分應用材料。
- ▶ For different industry usages, our flute diameter is ranging from 0.04mm~30mm.
 為符合不同產業的需求，我們可提供的刃長直徑範圍有 0.04 毫米~30 毫米。
- ▶ A material offering differs from composite carbide, ceramics, diamond etc.
 提供的材料有複合式鎢鋼、陶瓷、鑽石等。
- ▶ Persistence to high standard quality, TOPGREEN insists on using SUMITOMO.
 TOPGREEN 要求持久性高標準的品質，堅持使用日本住友的鎢鋼材料。
- ▶ Innovative patented braze technology, product cost can be reduced.
 創新專利之焊接技術，可以降低產品成本。
- ▶ Tip persistence use Sumitomo material, offer high quality product.
 Tip 保證使用新材料，提供高品質的產品。
- ▶ New brazing technology can be applied under ϕ 30mm End Mill series.
 新的焊接技術可以應用於 ϕ 30mm 以下銑刀系列。

Blank series

Order 訂製品

Blank for PCB (Drill, Router.....) PCB 棒料 (鑽頭, 銑刀.....)

Drill 鑽頭

- 0.8mm series for ↓ 0.3mm Drill
- 1.15mm series for ↓ 0.45mm Drill

Router 銑刀 (S Type series 新焊接技術系列)

- 2.38 series for 0.7~1.2mm
- 3.0 series for 1.3~1.6mm

Blank for Cutting Tools (Drill, End Mill...) 機械刀具棒料 (鑽頭, 銑刀.....)

- S Type series for $\varnothing 2 \sim \varnothing 30\text{mm}$ 新焊接技術支援 $\varnothing 2 \sim \varnothing 30\text{毫米}$

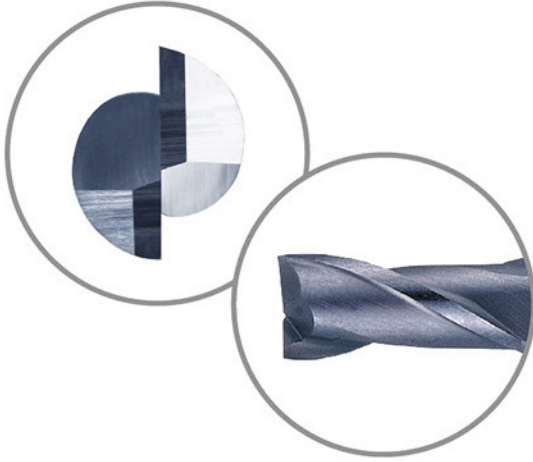




新焊接技術之機械刀具
New Brazing Technology for **Cutting Tools**

MS2 series

二刃鎢鋼立銼刀 **Regular Length, 2 Flute**



TOPGREEN provides creative solutions and premium services necessary for the clients success and creates business values.

Integrated Needs · Innovated Values 整合需求 · 創造價值 鏗鉅科技提供創造性的解決方案和優質的服務 成功地為客戶創造商業價值

MS2 series

Regular Length, 2 Flute 二刃鑄鋼立銼刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。



D ≤ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS2D0010S04	0.1	0.2	50	4	○	(B) (C) (S)
MS2D0020S04	0.2	0.4	50	4	○	(B) (C) (S)
MS2D0030S04	0.3	0.6	50	4	○	(B) (C) (S)
MS2D0040S04	0.4	0.8	50	4	○	(B) (C) (S)
MS2D0050S04	0.5	1	50	4	○	(B) (C) (S)
MS2D0060S04	0.6	1.2	50	4	○	(B) (C) (S)
MS2D0070S04	0.7	1.4	50	4	○	(B) (C) (S)
MS2D0080S04	0.8	1.6	50	4	○	(B) (C) (S)
MS2D0090S04	0.9	2	50	4	○	(B) (C) (S)
MS2D0100S04	1	2.5	50	4/6 ✕	○	(B) (C) (S)
MS2D0150S04	1.5	4	50	4/6 ✕	○	(B) (C) (S)
MS2D0200S04	2	6	50	4/6 ✕	○	(B) (C) (S)
MS2D0250S04	2.5	8	50	4/6 ✕	○	(B) (C) (S)
MS2D0300S04	3	8	50	4/6 ✕	○	(B) (C) (S)
MS2D0350S04	3.5	10	50	4/6 ✕	○	(B) (C) (S)
MS2D0400S04	4	11	50	4/6 ✕	○	(B) (C) (S)
MS2D0450S06	4.5	11	50	6	✕	(B) (C) (S)
MS2D0500S06	5	13	50	6	✕	(B) (C) (S)
MS2D0600S06	6	15	50	6	○	(B) (C) (S)
MS2D0800S08	7/8	20	60	✕ 7/8	○	(B) (C) (S)
MS2D1000S10	9/10	25	75	✕ 9/10	○	(B) (C) (S)
MS2D1200S12	11/12	30	75	✕ 11/12	○	(B) (C) (S)
MS2D1400S14	13/14	30	80	16	✕	(B) (C) (S)
MS2D1500S15	15	30	80	16	✕	(B) (C) (S)
MS2D1600S16	16	30	80	16	✕	(B) (C) (S)
MS2D2000S20	20	40	100	20	✕	(B) (C) (S)

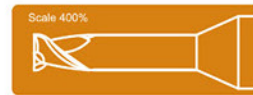
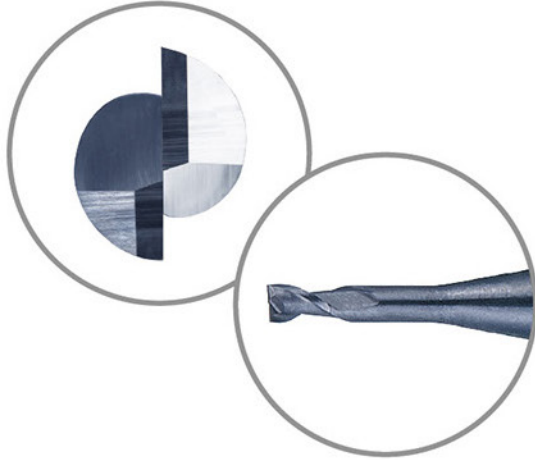
○ Standard 標準品 ✕ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC		~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○		○	○				○	○					


○ Excellent ○ Better

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二刃深溝加工鎢鋼立銑刀 For Deep Rib Processing, Long Neck, 2 Flute


■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

 D ≤ 3 -0.005~-0.02
 3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刀徑	Flute Length (<i>l</i>) 溝長	Effective Length (<i>l</i> ₁) 有效長	Overall Length (L) 全長	Shank Diameter (<i>d</i>) 柄徑	Stock 庫存	Blank Type 棒料型式
XL2D0020E010	0.2	0.3	1	50	4	○	(B) (C) (S)
XL2D0020E015	0.2	0.3	1.5	50	4	○	(B) (C) (S)
XL2D0020E020	0.2	0.3	2	50	4	○	(B) (C) (S)
XL2D0030E010	0.3	0.4	1	50	4	○	(B) (C) (S)
XL2D0030E020	0.3	0.4	2	50	4	○	(B) (C) (S)
XL2D0030E030	0.3	0.4	3	50	4	○	(B) (C) (S)
XL2D0030E040	0.3	0.4	4	50	4	○	(B) (C) (S)
XL2D0040E010	0.4	0.6	1	50	4	○	(B) (C) (S)
XL2D0040E020	0.4	0.6	2	50	4	○	(B) (C) (S)
XL2D0040E030	0.4	0.6	3	50	4	○	(B) (C) (S)
XL2D0040E040	0.4	0.6	4	50	4	○	(B) (C) (S)
XL2D0040E050	0.4	0.6	5	50	4	○	(B) (C) (S)
XL2D0050E020	0.5	0.7	2	50	4	○	(B) (C) (S)
XL2D0050E030	0.5	0.7	3	50	4	○	(B) (C) (S)
XL2D0050E040	0.5	0.7	4	50	4	○	(B) (C) (S)
XL2D0050E060	0.5	0.7	6	50	4	○	(B) (C) (S)
XL2D0050E080	0.5	0.7	8	50	4	○	(B) (C) (S)
XL2D0050E100	0.5	0.7	10	50	4	○	(B) (C) (S)
XL2D0060E020	0.6	0.9	2	50	4	○	(B) (C) (S)
XL2D0060E030	0.6	0.9	3	50	4	○	(B) (C) (S)
XL2D0060E040	0.6	0.9	3	50	4	○	(B) (C) (S)
XL2D0060E060	0.6	0.9	4	50	4	○	(B) (C) (S)
XL2D0060E080	0.6	0.9	8	50	4	○	(B) (C) (S)
XL2D0060E100	0.6	0.9	10	50	4	○	(B) (C) (S)

XL2 series

For Deep Rib Processing, Long Neck, 2 Flute 二刃深溝加工鑄鋼立銼刀

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 溝長	Effective Length (ℓ1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XL2D0070E020	0.7	1	2	50	4	○	(B) (C) (S)
XL2D0070E040	0.7	1	4	50	4	○	(B) (C) (S)
XL2D0070E060	0.7	1	6	50	4	○	(B) (C) (S)
XL2D0070E080	0.7	1	8	50	4	○	(B) (C) (S)
XL2D0070E100	0.7	1	10	50	4	○	(B) (C) (S)
XL2D0080E020	0.8	1.2	2	50	4	○	(B) (C) (S)
XL2D0080E040	0.8	1.2	4	50	4	○	(B) (C) (S)
XL2D0080E060	0.8	1.2	6	50	4	○	(B) (C) (S)
XL2D0080E080	0.8	1.2	8	50	4	○	(B) (C) (S)
XL2D0080E100	0.8	1.2	10	50	4	○	(B) (C) (S)
XL2D0100E030	1	1.5	3	50	4	○	(B) (C) (S)
XL2D0100E040	1	1.5	4	50	4	○	(B) (C) (S)
XL2D0100E060	1	1.5	6	50	4	○	(B) (C) (S)
XL2D0100E080	1	1.5	8	50	4	○	(B) (C) (S)
XL2D0100E100	1	1.5	10	50	4	○	(B) (C) (S)
XL2D0100E120	1	1.5	12	50	4	○	(B) (C) (S)
XL2D0100E140	1	1.5	14	50	4	○	(B) (C) (S)
XL2D0100E200	1	1.5	20	50	4	○	(B) (C) (S)
XL2D0150E040	1.5	2.3	4	50	4	○	(B) (C) (S)
XL2D0150E060	1.5	2.3	6	50	4	○	(B) (C) (S)
XL2D0150E080	1.5	2.3	8	50	4	○	(B) (C) (S)
XL2D0150E100	1.5	2.3	10	50	4	○	(B) (C) (S)
XL2D0150E120	1.5	2.3	12	50	4	○	(B) (C) (S)
XL2D0150E160	1.5	2.3	16	50	4	○	(B) (C) (S)
XL2D0150E200	1.5	2.3	20	50	4	○	(B) (C) (S)
XL2D0200E060	2	3	6	50	4	○	(B) (C) (S)
XL2D0200E080	2	3	8	50	4	○	(B) (C) (S)
XL2D0200E100	2	3	10	50	4	○	(B) (C) (S)
XL2D0200E120	2	3	12	50	4	○	(B) (C) (S)
XL2D0200E160	2	3	16	50	4	○	(B) (C) (S)
XL2D0200E200	2	3	20	50	4	○	(B) (C) (S)
XL2D0200E250	2	3	25	50	4	○	(B) (C) (S)
XL2D0250E100	2.5	3.7	10	50	4	○	(B) (C) (S)
XL2D0250E120	2.5	3.7	12	50	4	○	(B) (C) (S)
XL2D0250E160	2.5	3.7	16	50	4	○	(B) (C) (S)
XL2D0250E200	2.5	3.7	20	50	4	○	(B) (C) (S)
XL2D0250E250	2.5	3.7	25	50	4	○	(B) (C) (S)
XL2D0300E100	3	4.5	10	50	6	○	(B) (C) (S)
XL2D0300E120	3	4.5	12	50	6	○	(B) (C) (S)
XL2D0300E160	3	4.5	16	50	6	○	(B) (C) (S)
XL2D0300E200	3	4.5	20	60	6	○	(B) (C) (S)
XL2D0300E250	3	4.5	25	60	6	○	(B) (C) (S)
XL2D0300E300	3	4.5	30	60	6	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
~40HRC			~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB							
◎	◎	◎	◎	◎	◎	◎	◎	◎			◎				

◎ Excellent ○ Better

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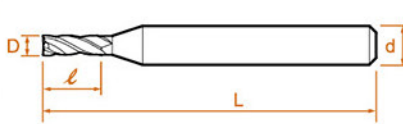
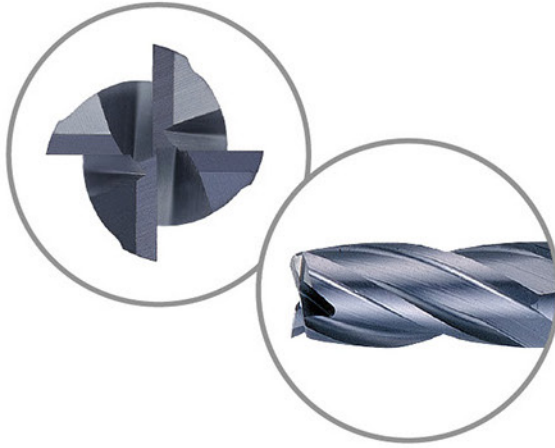
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新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

MS4 series

四刃鎢鋼立銑刀 **Regular Length, 4 Flute**

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。



D ≤ 3 -0.005~-0.02
 3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刀徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS4D0100S04	1	2.5	50	4/6 ✘	○	(B) (C) (S)
MS4D0150S04	1.5	4	50	4/6 ✘	○	(B) (C) (S)
MS4D0200S04	2	6	50	4/6 ✘	○	(B) (C) (S)
MS4D0250S04	2.5	8	50	4/6 ✘	○	(B) (C) (S)
MS4D0300S04	3	8	50	4/6 ✘	○	(B) (C) (S)
MS4D0350S04	3.5	10	50	4/6 ✘	○	(B) (C) (S)
MS4D0400S04	4	12	50	4/6 ✘	○	(B) (C) (S)
MS4D0400S06	4	12	50	6	○	(B) (C) (S)
MS4D0450S06	4.5	12	50	6	○	(B) (C) (S)
MS4D0500S06	5	13	50	6	○	(B) (C) (S)
MS4D0600S06	6	15	50	6	○	(B) (C) (S)
MS4D0800S08	7/8	20	60	✘ 7/8	○	(B) (C) (S)
MS4D1000S10	9/10	25	75	✘ 9/10	○	(B) (C) (S)
MS4D1200S12	11/12	30	75	✘ 11/12	○	(B) (C) (S)
MS4D1400S14	13/14	30	80	16	✘	(B) (C) (S)
MS4D1600S16	16	45	100	16	✘	(B) (C) (S)
MS4D2000S20	20	45	100	20	✘	(B) (C) (S)
MS4D2500S25	25	45	100	25	✘	(B) (C) (S)

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
			~40HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○	○	○	○	○	○	○	○						

○ Excellent ○ Better

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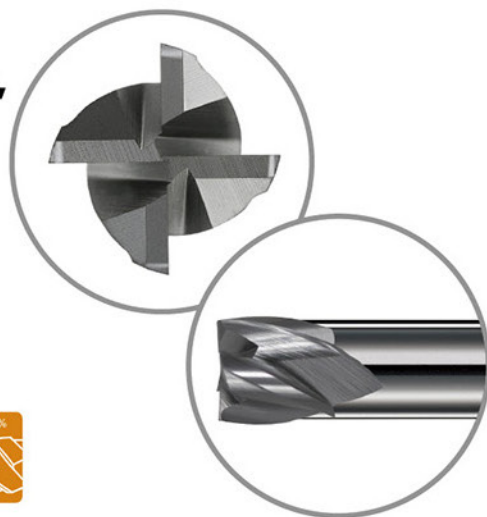
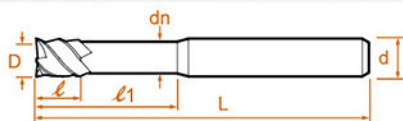
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新焊接技術之機械刀具
New Brazing Technology for Cutting Tools



XL4 series

For Deep Rib Processing, Long Neck, 4 Flute 四刃深溝加工鎢鋼立銑刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼 L D ≤ 3 -0.005~-0.02
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於攪結式刀桿。 3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Effective Length (ℓ1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XL4D0100E060	1	1.5	6	50	4	○	(B) (C) (S)
XL4D0100E080	1	1.5	8	50	4	○	(B) (C) (S)
XL4D0100E100	1	1.5	10	50	4	○	(B) (C) (S)
XL4D0100E120	1	1.5	12	50	4	○	(B) (C) (S)
XL4D0150E080	1.5	2.3	8	50	4	○	(B) (C) (S)
XL4D0150E100	1.5	2.3	10	50	4	○	(B) (C) (S)
XL4D0150E120	1.5	2.3	12	50	4	○	(B) (C) (S)
XL4D0150E160	1.5	2.3	16	50	4	○	(B) (C) (S)
XL4D0200E080	2	3	8	50	4	○	(B) (C) (S)
XL4D0200E100	2	3	10	50	4	○	(B) (C) (S)
XL4D0200E120	2	3	12	50	4	○	(B) (C) (S)
XL4D0200E160	2	3	16	50	4	○	(B) (C) (S)
XL4D0200E200	2	3	20	50	4	○	(B) (C) (S)
XL4D0250E100	2.5	3.7	10	50	4	○	(B) (C) (S)
XL4D0250E120	2.5	3.7	12	50	4	○	(B) (C) (S)
XL4D0250E160	2.5	3.7	16	50	4	○	(B) (C) (S)
XL4D0250E200	2.5	3.7	20	50	4	○	(B) (C) (S)
XL4D0300E100	3	4.5	10	50	6	○	(B) (C) (S)
XL4D0300E120	3	4.5	12	50	6	○	(B) (C) (S)
XL4D0300E160	3	4.5	16	50	6	○	(B) (C) (S)
XL4D0300E200	3	4.5	20	60	6	○	(B) (C) (S)
XL4D0300E250	3	4.5	25	60	6	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~40HRC	~45 HRC ~55 HRC	~60 HRC ~65 HRC	~35 HRC	~350HB							
⊙	⊙	⊙		⊙	○			○	○						

⊙ Excellent ○ Better

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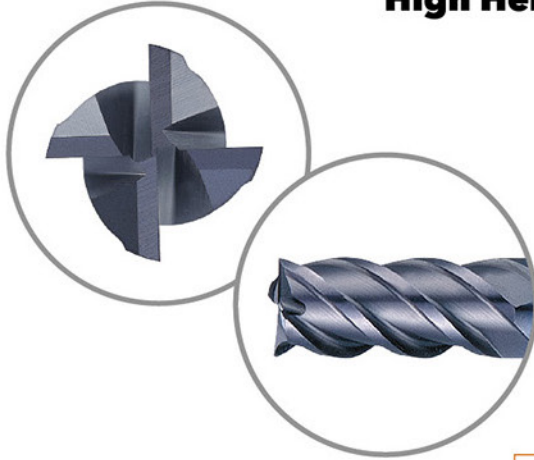
新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

MS4P series

High Helix, For Hardened Material, 4 Flute

四刃高螺旋、高硬度鑄鋼立銑刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。



D ≥ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS4PD0400S04	4	11	50	4	○	(B) (C) (S)
MS4PD0500S06	5	13	50	6	○	(B) (C) (S)
MS4PD0600S06	6	15	50	6	○	(B) (C) (S)
MS4PD0750S08	7.5	16	60	8	※	(B) (C) (S)
MS4PD0800S08	8	20	60	8	○	(B) (C) (S)
MS4PD1000S10	10	25	75	10	○	(B) (C) (S)
MS4PD1200S12	12	30	75	12	○	(B) (C) (S)
MS4PD1400S14	14	30	80	16	※	(B) (C) (S)
MS4PD1600S16	16	45	100	16	※	(B) (C) (S)
MS4PD2000S20	20	45	100	20	※	(B) (C) (S)
MS4PD2500S25	25	45	100	25	※	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
			~40HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○		○	○				○	○					

○ Excellent ○ Better

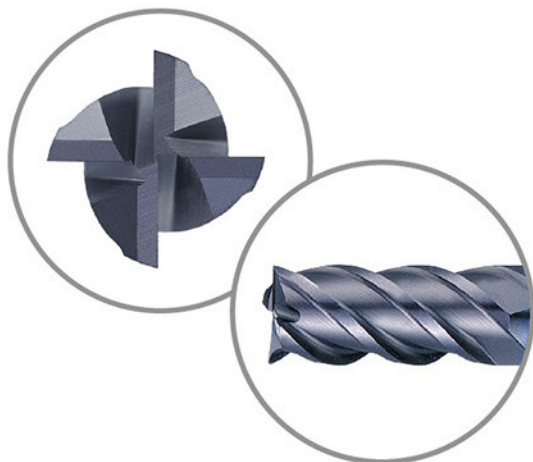
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MS4PL series

High Helix, For Hardened Material, Long Shank, 4 Flute

四刃高螺旋、高硬度長柄鑄鋼立銑刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼
* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿用於攪結式刀桿。

⊖ D ≤ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS4PLD0400L075	4	20	75	4	○	(B) (C) (S)
MS4PLD0500L075	5	20	75	6	○	(B) (C) (S)
MS4PLD0600L075	6	30	100	6	○	(B) (C) (S)
MS4PLD0750L100	7.5	30	100	8	※	(B) (C) (S)
MS4PLD0800L100	8	35	100	8	○	(B) (C) (S)
MS4PLD1000L100	10	35	100	10	○	(B) (C) (S)
MS4PLD1200L100	12	40	100	12	○	(B) (C) (S)
MS4PLD1400L100	14	60	150	16	※	(B) (C) (S)
MS4PLD1600L150	16	70	150	16	※	(B) (C) (S)
MS4PLD2000L200	20	100	200	20	※	(B) (C) (S)
MS4PLD2500L200	25	100	200	25	※	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
~40HRC				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
⊙	⊙	⊙		⊙	⊙				○	○					

⊙ Excellent ○ Better

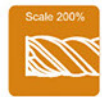
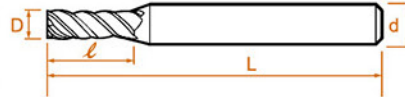
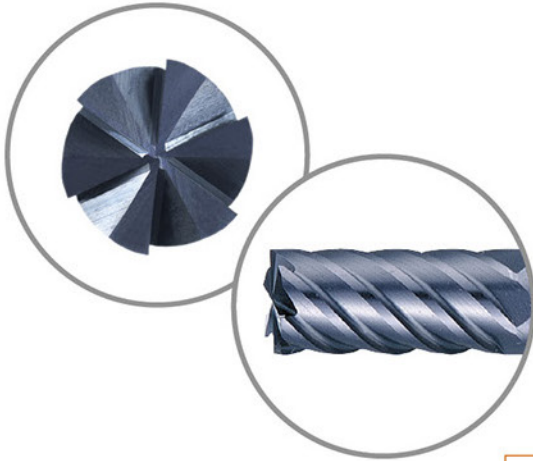


新焊接技術之機械刀具
New Brazing Technology for Cutting Tools

MS6P series

High Helix, For Hardened Material, 6 Flute

六刃高螺旋、高硬度鎢鋼立銑刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

D ≤ 3 -0.005 ~ -0.02
 3 < D ≤ 12 -0.01 ~ -0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS6PD0300S06	3	8	50	6	○	(B) (C) (S)
MS6PD0400S06	4	11	50	6	○	(B) (C) (S)
MS6PD0500S06	5	13	50	6	○	(B) (C) (S)
MS6PD0600S06	6	15	50	6	○	(B) (C) (S)
MS6PD0800S08	8	20	60	8	○	(B) (C) (S)
MS6PD1000S10	10	22	75	10	○	(B) (C) (S)
MS6PD1200S12	12	26	75	12	○	(B) (C) (S)
MS6PD1600S16	16	45	100	16	※	(B) (C) (S)
MS6PD2000S20	20	45	100	20	※	(B) (C) (S)
MS6PD2500S25	25	45	100	25	※	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC		~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
		○		○	○	○				○					

○ Excellent ○ Better

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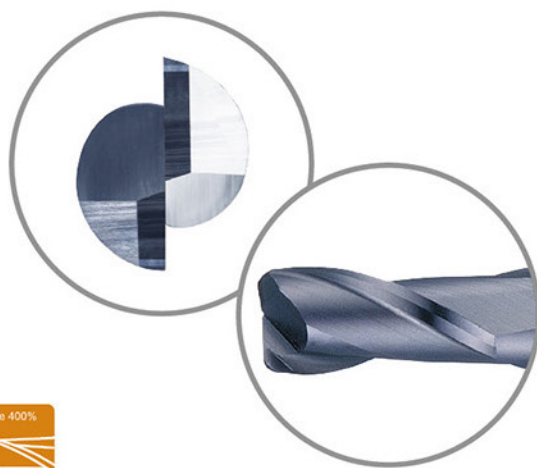
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新焊接技術之機械刀具
New Brazing Technology for Cutting Tools



MS2R series

Corner Radius, 2 Flute 二刃鑄鋼圓鼻刀



$D \leq 3$ -0.005~-0.02
 $3 < D \leq 12$ -0.01~-0.03

$R \pm 0.02$

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

Model No. 型號	Diameter (D) 刀徑	Corner Radius (R) R角	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS2RD0100R010	1	R0.1	2	50	4	○	(B) (C) (S)
MS2RD0100R020	1	R0.2	2	50	4	○	(B) (C) (S)
MS2RD0200R020	2	R0.2	4	50	4	○	(B) (C) (S)
MS2RD0200R050	2	R0.5	4	50	4	○	(B) (C) (S)
MS2RD0300R020	3	R0.2	6	50	4	○	(B) (C) (S)
MS2RD0300R050	3	R0.5	6	50	4	○	(B) (C) (S)
MS2RD0400R020	4	R0.2	8	50	4	○	(B) (C) (S)
MS2RD0400R050	4	R0.5	8	50	4	○	(B) (C) (S)
MS2RD0400R100	4	R1	8	50	4	○	(B) (C) (S)
MS2RD0600R020	6	R0.2	12	50	6	○	(B) (C) (S)
MS2RD0600R050	6	R0.5	12	50	6	○	(B) (C) (S)
MS2RD0600R100	6	R1	12	50	6	○	(B) (C) (S)
MS2RD0800R050	8	R0.5	16	60	8	○	(B) (C) (S)
MS2RD0800R100	8	R1	16	60	8	○	(B) (C) (S)
MS2RD0800R200	8	R2	16	60	8	○	(B) (C) (S)
MS2RD1000R050	10	R0.5	20	75	10	○	(B) (C) (S)
MS2RD1000R100	10	R1	20	75	10	○	(B) (C) (S)
MS2RD1000R200	10	R2	20	75	10	○	(B) (C) (S)
MS2RD1200R100	12	R1	24	75	12	○	(B) (C) (S)
MS2RD1200R200	12	R2	24	75	12	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC							
○	○	○		○	○			○	○						

○ Excellent ○ Better

TOPGREEN provides creative solutions and premium services necessary for the clients success and creates business values.

鐘鉅科技提供創造性的解決方案和優質的服務 成功地為客戶創造商業價值 整合需求·創造價值 Integrated Needs·Innovated Values

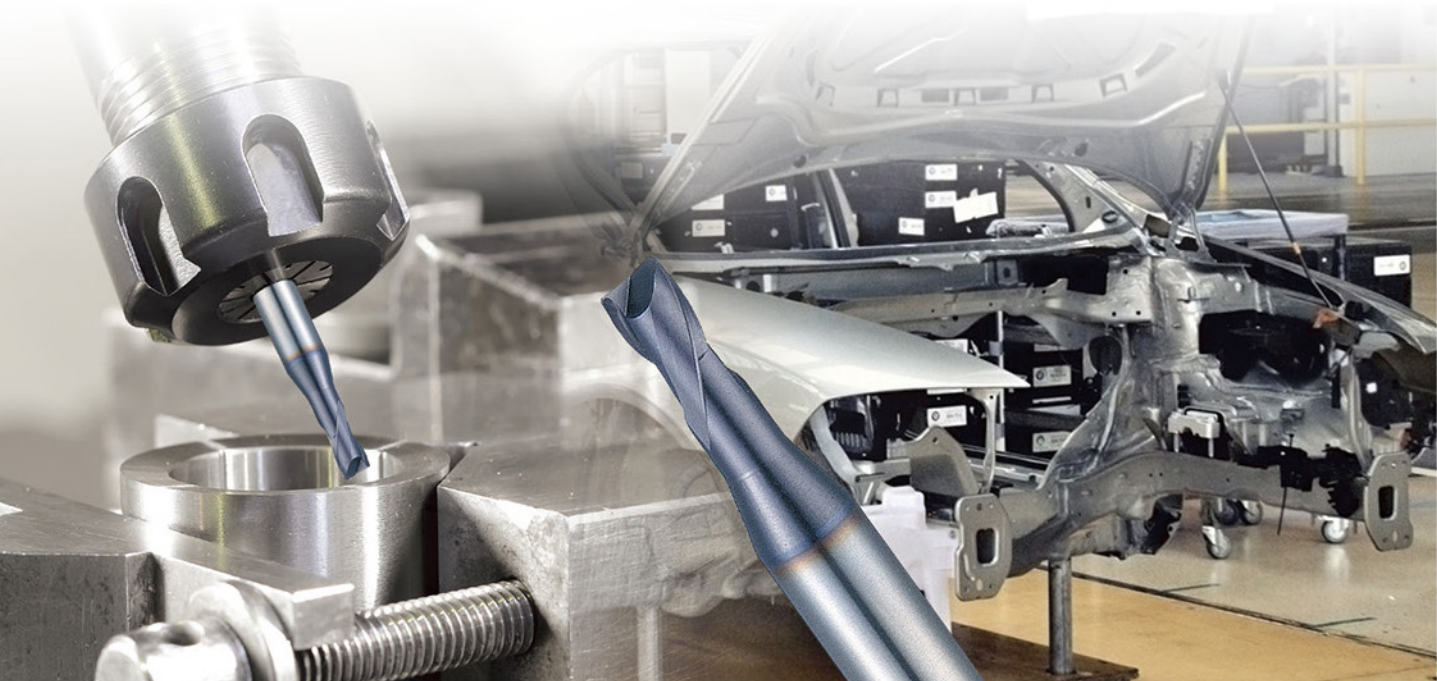
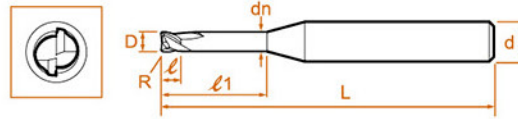
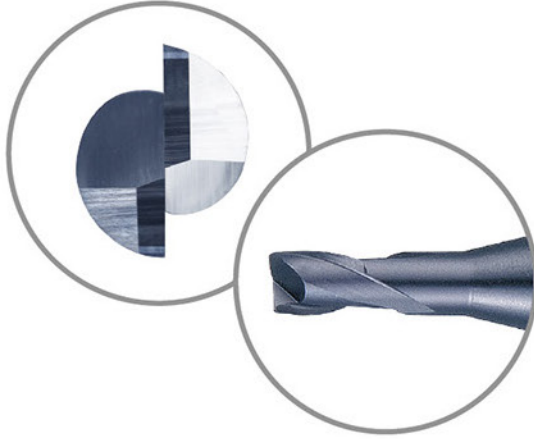


新焊接技術之機械刀具
New Brazing Technology for **Cutting Tools**

XL2R (XLRB2) series

Corner Radius, For Deep Rib Processing, Long Neck, 2 Flute

二刃深溝加工鎢鋼圓鼻刀



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XL2R (XLRB2) series

Corner Radius, For Deep Rib Processing, Long Neck, 2 Flute

二刃深溝加工鎢鋼圓鼻刀

D ≤ 3 -0.005~-0.02
 3 < D ≤ 6 0.01~-0.03

(B) Composite Blank 複合式棒料 (C) Solid Carbide 全鎢鋼 (S) S Type of New Brazing 鎢鋼接鎢鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

R ± 0.02

Model No. 型號	Diameter (D) 刀徑	Corner Radius (R) 角	Flute Length (ℓ) 溝長	Effective Length (ℓ1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XL2RD0100R010E030	1	R0.1	1	3	50	6	○	(B) (C) (S)
XL2RD0100R010E040	1	R0.1	1	4	50	6	○	(B) (C) (S)
XL2RD0100R010E060	1	R0.1	1	6	50	6	○	(B) (C) (S)
XL2RD0100R010E080	1	R0.1	1	8	50	6	○	(B) (C) (S)
XL2RD0100R010E100	1	R0.1	1	10	50	6	○	(B) (C) (S)
XL2RD0100R010E120	1	R0.1	1	12	50	6	○	(B) (C) (S)
XL2RD0100R010E140	1	R0.1	1	14	50	6	○	(B) (C) (S)
XL2RD0100R010E200	1	R0.1	1	20	50	6	○	(B) (C) (S)
XL2RD0150R015E040	1.5	R0.15	1.5	4	50	6	○	(B) (C) (S)
XL2RD0150R015E060	1.5	R0.15	1.5	6	50	6	○	(B) (C) (S)
XL2RD0150R015E080	1.5	R0.15	1.5	8	50	6	○	(B) (C) (S)
XL2RD0150R015E100	1.5	R0.15	1.5	10	50	6	○	(B) (C) (S)
XL2RD0150R015E120	1.5	R0.15	1.5	12	50	6	○	(B) (C) (S)
XL2RD0150R015E160	1.5	R0.15	1.5	16	50	6	○	(B) (C) (S)
XL2RD0150R015E200	1.5	R0.15	1.5	20	50	6	○	(B) (C) (S)
XL2RD0200R020E060	2	R0.2	2	6	50	6	○	(B) (C) (S)
XL2RD0200R020E080	2	R0.2	2	8	50	6	○	(B) (C) (S)
XL2RD0200R020E100	2	R0.2	2	10	50	6	○	(B) (C) (S)
XL2RD0200R020E120	2	R0.2	2	12	50	6	○	(B) (C) (S)
XL2RD0200R020E160	2	R0.2	2	16	50	6	○	(B) (C) (S)
XL2RD0200R020E200	2	R0.2	2	20	50	6	○	(B) (C) (S)
XL2RD0200R020E250	2	R0.2	2	25	50	6	○	(B) (C) (S)
XL2RD0300R020E080	3	R0.2	3	8	50	6	○	(B) (C) (S)
XL2RD0300R020E100	3	R0.2	3	10	50	6	○	(B) (C) (S)
XL2RD0300R020E120	3	R0.2	3	12	50	6	○	(B) (C) (S)
XL2RD0300R020E160	3	R0.2	3	16	50	6	○	(B) (C) (S)
XL2RD0300R020E200	3	R0.2	3	20	50	6	○	(B) (C) (S)
XL2RD0300R020E250	3	R0.2	3	25	50	6	○	(B) (C) (S)
XL2RD0300R020E300	3	R0.2	3	30	50	6	○	(B) (C) (S)
XL2RD0400R020E100	4	R0.2	4	10	50	6	○	(B) (C) (S)
XL2RD0400R020E160	4	R0.2	4	16	50	6	○	(B) (C) (S)
XL2RD0400R020E200	4	R0.2	4	20	50	6	○	(B) (C) (S)
XL2RD0600R050E120	6	R0.5	6	12	50	6	○	(B) (C) (S)
XL2RD0600R100E120	6	R1	6	12	50	6	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB							
○	○	○	○	○					○						

○ Excellent ○ Better

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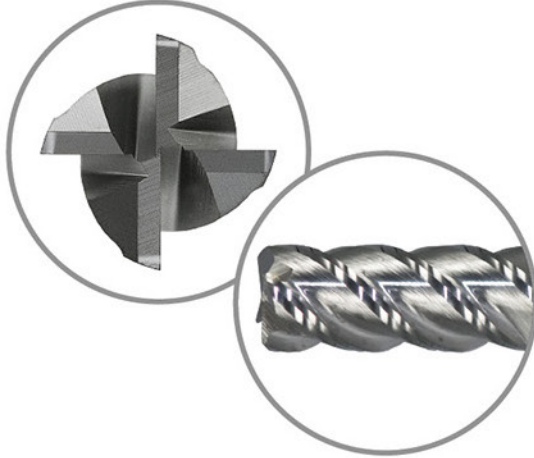
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新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

MS4R series

四刃鎢鋼圓鼻刀 **Corner Radius, 4 Flute**
 $D \leq 3 \quad -0.005 \sim -0.02$
 $3 < D \leq 12 \quad -0.01 \sim -0.03$
 $R \pm 0.02$

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鑄接鎢鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

Model No. 型號	Diameter (D) 刀徑	Corner Radius (R) R角	Flute Length (l) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
MS4RD0400R020	4	R0.2	10	50	4	○	(B) (C) (S)
MS4RD0400R050	4	R0.5	10	50	6	○	(B) (C) (S)
MS4RD0500R050	5	R0.5	12.5	50	6	○	(B) (C) (S)
MS4RD0500R100	5	R1	12.5	50	6	○	(B) (C) (S)
MS4RD0600R050	6	R0.5	15	60	6	○	(B) (C) (S)
MS4RD0600R100	6	R1	15	60	6	○	(B) (C) (S)
MS4RD0800R050	8	R0.5	20	75	8	○	(B) (C) (S)
MS4RD0800R100	8	R1	20	75	8	○	(B) (C) (S)
MS4RD1000R050	10	R0.5	25	75	10	○	(B) (C) (S)
MS4RD1000R100	10	R1	25	75	10	○	(B) (C) (S)
MS4RD1000R200	10	R2	25	75	10	○	(B) (C) (S)
MS4RD1200R050	12	R0.5	30	75	12	○	(B) (C) (S)
MS4RD1200R100	12	R1	30	75	12	○	(B) (C) (S)
MS4RD1200R200	12	R2	30	75	12	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC		~350HB					
○	○	○		○	○				○	○					

○ Excellent ○ Better

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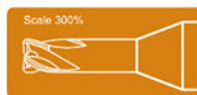
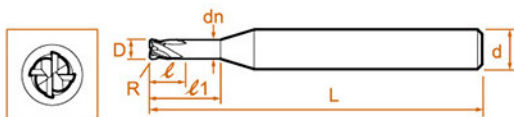
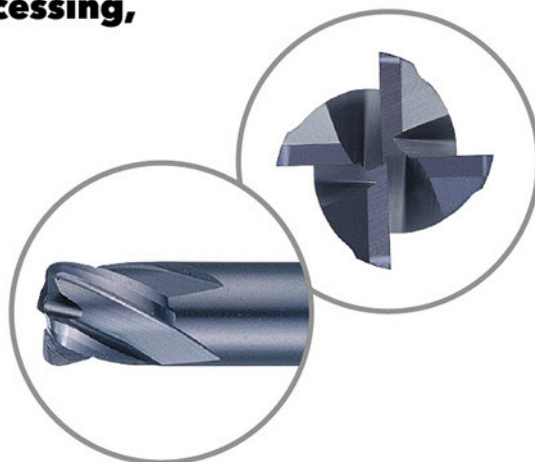
新焊接技術之機械刀具
New Brazing Technology for Cutting Tools



XL4R (SS4R) series

Corner Radius, For Deep Rib Processing,

4 Flute 四刃深溝加工鎢鋼圓鼻刀



D ≤ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

R ± 0.02

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

Model No. 型號	Diameter (D) 刀徑	Corner Radius (R) R角	Flute Length (l) 刃長	Effective Length (l1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XL4RD0300R020	3	R0.2	3	10	50	6	○	(B) (C) (S)
XL4RD0300R050	3	R0.5	3	10	50	6	○	(B) (C) (S)
XL4RD0400R020	4	R0.2	4	12	50	6	○	(B) (C) (S)
XL4RD0400R050	4	R0.5	4	12	50	6	○	(B) (C) (S)
XL4RD0500R050	5	R0.5	5	15	50	6	○	(B) (C) (S)
XL4RD0500R100	5	R1	5	15	50	6	○	(B) (C) (S)
XL4RD0600R050	6	R0.5	6	18	60	6	○	(B) (C) (S)
XL4RD0600R100	6	R1	6	18	60	6	○	(B) (C) (S)
XL4RD0800R050	8	R0.5	8	24	75	8	○	(B) (C) (S)
XL4RD0800R100	8	R1	8	24	75	8	○	(B) (C) (S)
XL4RD1000R050	10	R0.5	10	30	75	10	○	(B) (C) (S)
XL4RD1000R100	10	R1	10	30	75	10	○	(B) (C) (S)
XL4RD1000R200	10	R2	10	30	75	10	○	(B) (C) (S)
XL4RD1200R050	12	R0.5	12	36	75	12	○	(B) (C) (S)
XL4RD1200R100	12	R1	12	36	75	12	○	(B) (C) (S)
XL4RD1200R200	12	R2	12	36	75	12	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○		○	○				○	○					

○ Excellent ○ Better

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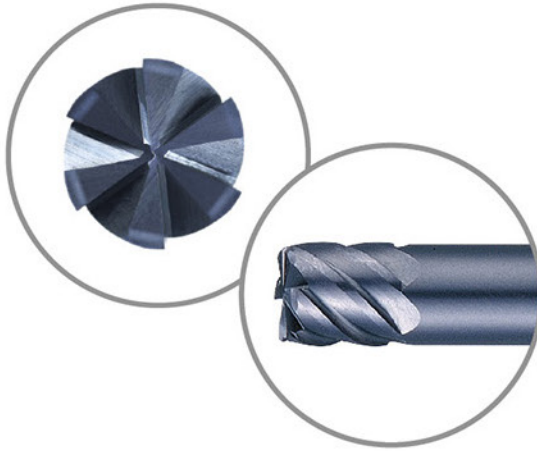
新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

XL6R(SS6R) series

Corner Radius, For Deep Rib Processing and Hardened Material, 6 Flute

六刃深溝加工高硬度鑄鋼圓鼻刀



(by Order) 訂製品


 $D \leq 3 \quad -0.005 \sim -0.02$
 $3 < D \leq 12 \quad -0.01 \sim -0.03$

■ (B) Composite Blank 複合式棒料
 ■ (C) Solid Carbide 全鑄鋼
 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

 $R \pm 0.02$

Model No. 型號	Diameter (D) 刃徑	Corner Radius (R) R角	Flute Length (l) 刃長	Effective Length (l1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XL6RD0600R050	6	R0.5	6	18	50	6	※	(B) (C) (S)
XL6RD0800R050	8	R0.5	8	24	60	8	※	(B) (C) (S)
XL6RD1000R100	10	R1	10	30	75	10	※	(B) (C) (S)
XL6RD1200R100	12	R1	12	36	75	12	※	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC		~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC							
		○		○	◎	◎			○						

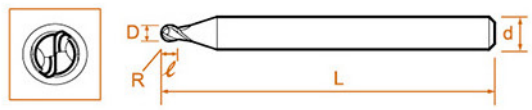
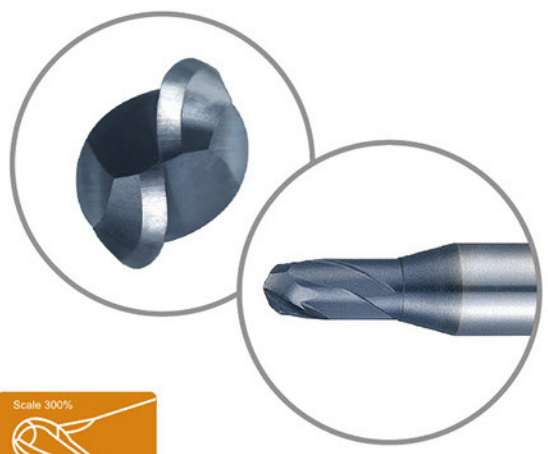
◎ Excellent ○ Better

新焊接技術之機械刀具
New Brazing Technology for Cutting Tools



SB2 series

Ball Nose, 2 Flute 二刃鑄鋼球刀



D<6 0~-0.028
 6 ≤ D 0~-0.038

R ± 0.01

(B) Composite Blank 複合式棒料 **(C)** Solid Carbide 全鑄鋼 **(S)** S Type of New Brazing 鑄鋼接鑄鋼
* **(B)** Not available for SUS with shrink fit chuck. **(B)** 不銹鋼 (SUS) 的複合式刀具請勿用於燒結式刀桿。

Model No. 型號	Radius (R) R角	Diameter (D) 刀徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
SB2R0010S04	R0.1	0.2	0.2	50	4	○	(B) (C) (S)
SB2R0015S04	R0.15	0.3	0.5	50	4	○	(B) (C) (S)
SB2R0020S04	R0.2	0.4	0.6	50	4	○	(B) (C) (S)
SB2R0025S04	R0.25	0.5	0.8	50	4	○	(B) (C) (S)
SB2R0030S04	R0.3	0.6	0.9	50	4	○	(B) (C) (S)
SB2R0040S04	R0.4	0.8	1.2	50	4	○	(B) (C) (S)
SB2R0050S04	R0.5	1	1.5	50	4	○	(B) (C) (S)
SB2R0075S04	R0.75	1.5	2.3	50	4	○	(B) (C) (S)
SB2R0100S04	R1	2	3	50	4	○	(B) (C) (S)
SB2R0125S04	R1.25	2.5	3.8	50	4	○	(B) (C) (S)
SB2R0150S03	R1.5	3	4.5	50	3	○	(B) (C) (S)
SB2R0150S04	R1.5	3	4.5	50 / 60	4	○	(B) (C) (S)
SB2R0175S04	R1.75	3.5	5.3	50	4	○	(B) (C) (S)
SB2R0200S04	R2	4	6	50	4	○	(B) (C) (S)
SB2R0250S06	R2.5	5	7.5	50	6	○	(B) (C) (S)
SB2R0300S06	R3	6	9	50	6	○	(B) (C) (S)
SB2R0400S08	R4	8	12	60	8	○	(B) (C) (S)
SB2R0500S10	R5	10	15	75	10	○	(B) (C) (S)
SB2R0600S12	R6	12	18	75	12	○	(B) (C) (S)
SB2R0700S14	R7	14	24	80	14	✘	(B) (C) (S)
SB2R0800S16	R8	16	24	100	16	✘	(B) (C) (S)
SB2R1000S20	R10	20	30	150	20	✘	(B) (C) (S)
SB2R1250S25	R12.5	25	35	150	25	✘	(B) (C) (S)

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○		○	○			○	○						

○ Excellent ○ Better

TOPGREEN provides creative solutions and premium services necessary for the clients success and creates business values.

鐘鉅科技提供創造性的解決方案和優質的服務 成功地為客戶創造商業價值 整合需求·創造價值 Integrated Needs·Innovated Values



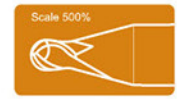
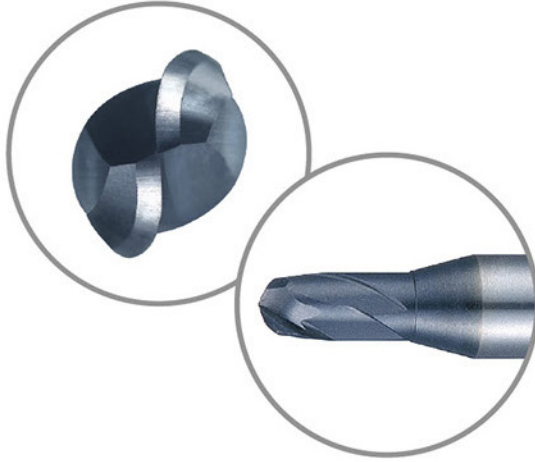
新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

SB2L series

Ball Nose, Long Shank, 2 Flute

二刃長柄鑄鋼球刀



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

$D < 6$ 0--0.028
 $6 \leq D$ 0--0.038

$R \pm 0.01$

Model No. 型號	Radius (R) R角	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
SB2LR0100L075	R1	2	3	75	4	○	(B) (C) (S)
SB2LR0200L075	R2	4	6	75	4	○	(B) (C) (S)
SB2LR0300L075	R3	6	9	75	6	○	(B) (C) (S)
SB2LR0300L100	R3	6	9	100	6	○	(B) (C) (S)
SB2LR0400L100	R4	8	12	100	8	○	(B) (C) (S)
SB2LR0500L100	R5	10	15	100	10	○	(B) (C) (S)
SB2LR0600L100	R6	12	18	100	12	○	(B) (C) (S)
SB2LR0700L100	R7	14	24	100	14	✗	(B) (C) (S)
SB2LR0800L150	R8	16	24	150	16	✗	(B) (C) (S)
SB2LR0800L200	R8	16	24	200	16	✗	(B) (C) (S)
SB2LR1000L200	R10	20	30	200	20	✗	(B) (C) (S)
SB2LR1250L200	R12.5	25	35	200	25	✗	(B) (C) (S)

○ Standard 標準品 ✗ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
~40HRC				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○	○	○	○				○	○					

○ Excellent ○ Better

新焊接技術之機械刀具
New Brazing Technology for Cutting Tools



SB2P series

Ball Nose, For Hardened Material, 2 Flute 高硬度加工二刃鎢鋼球刀



$D < 6$ 0--0.028
 $6 \leq D$ 0--0.038

$R \pm 0.01$

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼
* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於鎖結式刀桿。

Model No. 型號	Radius (R) R角	Diameter (D) 刀徑	Flute Length (L) 刃長	Effective Length (l1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
SB2PR0015S06	R0.15	0.3	0.3	0.6	50	6	○	(B) (C) (S)
SB2PR0020S06	R0.2	0.4	0.4	0.8	50	6	○	(B) (C) (S)
SB2PR0025S06	R0.25	0.5	0.5	1.0	50	6	○	(B) (C) (S)
SB2PR0030S06	R0.3	0.6	0.6	1.2	50	6	○	(B) (C) (S)
SB2PR0040S06	R0.4	0.8	0.8	1.6	50	6	○	(B) (C) (S)
SB2PR0050S06	R0.5	1	1	2.5	50	6	○	(B) (C) (S)
SB2PR0075S06	R0.75	1.5	1.5	4	50	6	○	(B) (C) (S)
SB2PR0100S06	R1	2	2	6	60	6	○	(B) (C) (S)
SB2PR0125S06	R1.25	2.5	2.5	6	60	6	○	(B) (C) (S)
SB2PR0150S06	R1.5	3	3	8	60	6	○	(B) (C) (S)
SB2PR0175S06	R1.75	3.5	3.5	8	60	6	○	(B) (C) (S)
SB2PR0200S06	R2	4	4	8	60	6	○	(B) (C) (S)
SB2PR0250S06	R2.5	5	5	12	60	6	○	(B) (C) (S)
SB2PR0300S06	R3	6	6	13	60	6	○	(B) (C) (S)
SB2PR0400S08	R4	8	8	14	60	8	○	(B) (C) (S)
SB2PR0500S10	R5	10	10	18	75	10	○	(B) (C) (S)
SB2PR0600S12	R6	12	12	22	75	12	○	(B) (C) (S)
SB2PR0700S14	R7	14	24		80	14	✘	(B) (C) (S)
SB2PR0800S16	R8	16	24		100	16	✘	(B) (C) (S)
SB2PR1000S20	R10	20	30		150	18	✘	(B) (C) (S)
SB2PR1250S25	R12.5	25	35		150	20	✘	(B) (C) (S)

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
				~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
○	○	○		◎				○	○						

◎ Excellent ○ Better

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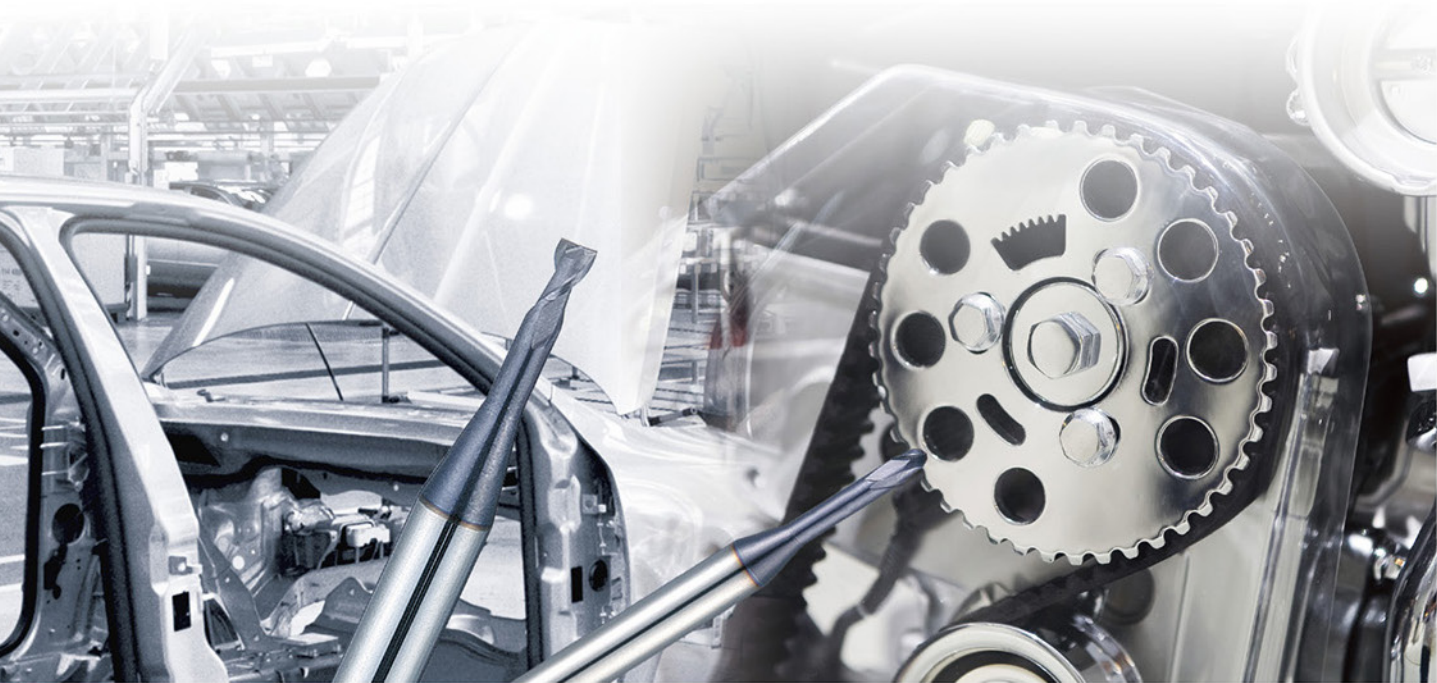
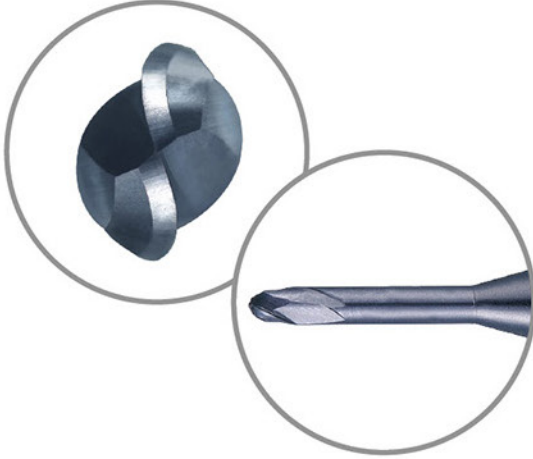


新焊接技術之機械刀具
New Brazing Technology for **Cutting Tools**

XLB2 series

Ball Nose, For Deep Rib Processing, Long Neck, 2 Flute

二刃深溝加工鎢鋼球刀



XLB2 series

Ball Nose, For Deep Rib Processing, Long Neck, 2 Flute

二刃深溝加工鑄鋼球刀



■ (B) Composite Blank 複合式棒料
 ■ (C) Solid Carbide 全鑄鋼
 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

Model No. 型號	Radius (R) R角	Diameter (D) 刀徑	Flute Length (ℓ) 溝長	Effective Length (ℓ1) 有效長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
XLB2R0020E020	R0.2	0.4	0.7	2	50	4	○	(B) (C) (S)
XLB2R0020E040	R0.2	0.4	0.7	4	50	4	○	(B) (C) (S)
XLB2R0025E040	R0.25	0.5	0.8	4	50	4	○	(B) (C) (S)
XLB2R0025E060	R0.25	0.5	0.8	6	50	4	○	(B) (C) (S)
XLB2R0030E040	R0.3	0.6	0.9	4	50	4	○	(B) (C) (S)
XLB2R0030E060	R0.3	0.6	0.9	6	50	4	○	(B) (C) (S)
XLB2R0030E080	R0.3	0.6	0.9	8	50	4	○	(B) (C) (S)
XLB2R0040E040	R0.4	0.8	1.2	4	50	4	○	(B) (C) (S)
XLB2R0040E060	R0.4	0.8	1.2	6	50	4	○	(B) (C) (S)
XLB2R0040E080	R0.4	0.8	1.2	8	50	4	○	(B) (C) (S)
XLB2R0050E040	R0.5	1	1.5	4	50	4	○	(B) (C) (S)
XLB2R0050E060	R0.5	1	1.5	6	50	4	○	(B) (C) (S)
XLB2R0050E080	R0.5	1	1.5	8	50	4	○	(B) (C) (S)
XLB2R0050E100	R0.5	1	1.5	10	50	4	○	(B) (C) (S)
XLB2R0050E120	R0.5	1	1.5	12	50	4	○	(B) (C) (S)
XLB2R0075E080	R0.75	1.5	1.5	8	50	4	○	(B) (C) (S)
XLB2R0075E100	R0.75	1.5	1.5	10	50	4	○	(B) (C) (S)
XLB2R0075E120	R0.75	1.5	1.5	12	50	4	○	(B) (C) (S)
XLB2R0075E160	R0.75	1.5	1.5	16	50	4	○	(B) (C) (S)
XLB2R0100E080	R1	2	2	8	50	4	○	(B) (C) (S)
XLB2R0100E100	R1	2	2	10	50	4	○	(B) (C) (S)
XLB2R0100E120	R1	2	2	12	60	4	○	(B) (C) (S)
XLB2R0100E160	R1	2	2	16	60	4	○	(B) (C) (S)
XLB2R0100E200	R1	2	2	20	60	4	○	(B) (C) (S)
XLB2R0150E160	R1.5	3	3	16	75	6	○	(B) (C) (S)
XLB2R0150E200	R1.5	3	3	20	75	6	○	(B) (C) (S)
XLB2R0150E250	R1.5	3	3	25	60	6	○	(B) (C) (S)
XLB2R0200E160	R2	4	4	16	75	6	○	(B) (C) (S)
XLB2R0200E200	R2	4	4	20	75	6	○	(B) (C) (S)
XLB2R0200E250	R2	4	4	25	75	6	○	(B) (C) (S)
XLB2R0200E300	R2	4	4	30	75	6	○	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
~40HRC			~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB							
○	○	○	○	○				○			○				

○ Excellent ○ Better

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新焊接技術之機械刀具
New Brazing Technology for Cutting Tools

2HA series

鋁合金專用二刃鎢鋼立銑刀 **For Aluminum Alloy, 2 Flute**



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。



$D \leq 3 \quad -0.005 \sim -0.02$
 $3 < D \leq 12 \quad -0.01 \sim -0.03$

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Shank Diameter (d) 柄徑	Overall Length (L) 全長	Stock 庫存	Blank Type 棒料型式
2HAD0100S04/6	1	3	4/6	50	○	(B) (C) (S)
2HAD0150S04/6	1.5	6	4/6	50	○	(B) (C) (S)
2HAD0200S04/6	2	6	4/6	50	○	(B) (C) (S)
2HAD0300S04/6	3	9	4/6	50	○	(B) (C) (S)
2HAD0400S04/6	4	12	4/6	50	○	(B) (C) (S)
2HAD0500S06	5	15	6	50	○	(B) (C)
2HAD0600S06	6	18	6	50	○	(B) (C)
2HAD0800S08	8	20	8	60	✘	(B) (C)
2HAD1000S10	10	30	10	75	✘	(B) (C)
2HAD1200S12	12	32	12	75	✘	(B) (C)
2HAD1600S16	16	45	16	100	✘	(B) (C)
2HAD2000S20	16	45	20	100	✘	(B) (C)

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
			~40HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB	○	⊙				

⊙ Excellent ○ Better

3HA series

For Aluminum Alloy, 3 Flute 鋁合金專用三刃鎢鋼立銑刀



(B) Composite Blank 複合式棒料
 (C) Solid Carbide 全鎢鋼
 (S) S Type of New Brazing 鎢鋼接鎢鋼
 * (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

$D \leq 3 \quad -0.005 \sim -0.02$
 $3 < D \leq 12 \quad -0.01 \sim -0.03$

Model No. 型號	Diameter (D) 刀徑	Flute Length (ℓ) 刃長	Shank Diameter (d) 柄徑	Overall Length (L) 全長	Stock 庫存	Blank Type 棒料型式
3HAD0100S04	1	3	4	50	○	(B) (C) (S)
3HAD0150S04	1.5	4	4	50	○	(B) (C) (S)
3HAD0200S04	2	6	4	50	○	(B) (C) (S)
3HAD0300S04	3	9	4	50	○	(B) (C) (S)
3HAD0300S06	3	9	6	50	○	(B) (C) (S)
3HAD0400S04	4	12	4	50	○	(B) (C) (S)
3HAD0400S06	4	12	6	50	○	(B) (C) (S)
3HAD0500S06	5	15	6	50	○	(B) (C) (S)
3HAD0600S06	6	18	6	50	○	(B) (C) (S)
3HAD0800S08	8	20	8	60	○	(B) (C) (S)
3HAD1000S10	10	30	10	75	○	(B) (C) (S)
3HAD1200S12	12	32	12	75	○	(B) (C) (S)
3HAD1600S16	16	45	16	100	✗	(B) (C) (S)
3HAD2000S20	20	45	20	100	✗	(B) (C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC		~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB						
										○	⊗				

⊗ Excellent ○ Better



新焊接技術之機械刀具
New Brazing Technology for Cutting Tools

2HAL series

鋁合金專用二刃長柄鑄鋼立銑刀 **For Aluminum Alloy, Long Shank, 2 Flute**



■ (C) Solid Carbide 全鑄鋼 ■ (S) S Type of New Brazing 鑄鋼接鑄鋼



D ≤ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Shank Diameter (d) 柄徑	Overall Length (L) 全長	Stock 庫存	Blank Type 棒料型式
2HALD0100L075	1	3	4	75	○	(C) (S)
2HALD0150L075	1.5	4	4	75	○	(C) (S)
2HALD0200L075	2	6	4	75	○	(C) (S)
2HALD0300L075	3	12	4	75	○	(C) (S)
2HALD0300L100	3	20	6	100	○	(C) (S)
2HALD0400L075	4	14	4	75	○	(C) (S)
2HALD0400L100	4	25	6	100	○	(C) (S)
2HALD0500L100	5	25	6	100	○	(C) (S)
2HALD0600L100	6	25	6	100	○	(C) (S)
2HALD0800L100	8	40	8	100	○	(C) (S)
2HALD1000L100	10	45	10	100	○	(C) (S)
2HALD1200L100	12	45	12	100	○	(C) (S)
2HALD1600L150	16	85	16	150	✘	(C) (S)
2HALD2000L200	20	80	20	150	✘	(C) (S)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC		~45 HRC ~55 HRC	~60 HRC ~65 HRC	~35 HRC		~350HB							
									○	◎					

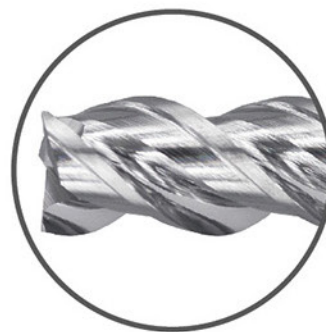
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TOPGREEN provides creative solutions and premium services necessary for the clients success and creates business values.

Integrated Needs · Innovated Values 整合需求 · 創造價值 鑄鋼科技提供創造性的解決方案和優質的服務 成功地為客戶創造商業價值

3HAL series

For Aluminum Alloy, Long Shank, 3 Flute 鋁合金專用三刃長柄鎢鋼立銼刀



■ (C) Solid Carbide 全鎢鋼 ■ (S) S Type of New Brazing 鎢鋼接鎢鋼

D ≤ 3 -0.005~-0.02
3 < D ≤ 12 -0.01~-0.03

Model No. 型號	Diameter (D) 刃徑	Flute Length (ℓ) 刃長	Shank Diameter (d) 柄徑	Overall Length (L) 全長	Stock 庫存	Blank Type 棒料型式
3HALD0100L075	1	3	4/6	75	○	(C) (S)
3HALD0150L075	1.5	4	4/6	75	○	(C) (S)
3HALD0200L075	2	6	4/6	75	○	(C) (S)
3HALD0300L075	3	12	4/6	75	○	(C) (S)
3HALD0300L100	3	20	4/6	100	○	(C) (S)
3HALD0400L075	4	14	4/6	75	○	(C) (S)
3HALD0400L100	4	25	6	100	○	(C) (S)
3HALD0500L100	5	25	6	100	○	(C) (S)
3HALD0600L100	6	25	6	100	○	(C) (S)
3HALD0800L100	8	40	8	100	○	(C) (S)
3HALD1000L100	10	45	10	100	○	(C) (S)
3HALD1200L100	12	45	12	100	○	(C) (S)
3HALD1600L150	16	85	16	150	✘	(C) (S)
3HALD2000L200	20	80	20	150	✘	(C) (S)

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Carbon Steels	Alloy Steels	Tools Steels	Prehardened Steels	Prehardened Steels	Hardened Steels	Stainless Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum Alloy	Graphite	Titanium Alloys	Heat Resistant Alloys	Plastic	Composite Material CFRP
		~40HRC	~45 HRC	~55 HRC	~60 HRC	~65 HRC	~35 HRC	~350HB							
									○	⊗					

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新焊接技術之機械刀具
New Brazing Technology for **Cutting Tools**

ESD series

短刃銼刀柄鑽頭 **Carbide Drills**



(By Order) 訂製品



TOPGREEN provides creative solutions and premium services necessary for the clients success and creates business values.

Integrated Needs · Innovated Values 整合需求·創造價值 鑽鉅科技提供創造性的解決方案和優質的服務 成功地為客戶創造商業價值

ESD series

Carbide Drills 短刃銑刀柄鑽頭

■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鎢鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於燒結式刀桿。

Model No. 型號	Diameter (D) 刀徑	Flute Length (ℓ) 刃長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
ESD20100L100	1	10	40	3	✘	(B) (C)
ESD20200L130	2	13	40	3	✘	(B) (C)
ESD20100L160	3	16	40	3	✘	(B) (C)
ESD20400L220	4	22	60	4	✘	(B) (C)
ESD20500L260	5	26	70	5	✘	(B) (C)
ESD20600L280	6	28	70	6	✘	(B) (C)
ESD20700L390	7	39	70	7	✘	(B) (C)
ESD20800L440	8	44	80	8	✘	(B) (C)
ESD20900L440	9	44	80	9	✘	(B) (C)
ESD21000L500	10	50	90	10	✘	(B) (C)
ESD21100L550	11	55	95	11	✘	(B) (C)
ESD21200L580	12	58	120	12	✘	(B) (C)
ESD21300L580	13	58	120	13	✘	(B) (C)
ESD21400L580	14	58	120	14	✘	(B) (C)
ESD21500L600	15	60	120	15	✘	(B) (C)
ESD21600L620	16	62	130	16	✘	(B) (C)
ESD21700L640	17	64	130	17	✘	(B) (C)
ESD21800L660	18	66	150	18	✘	(B) (C)
ESD21900L680	19	68	150	19	✘	(B) (C)
ESD22000L700	20	70	150	20	✘	(B) (C)

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels			Quenched and Tempered Steels			Stainless Steels	Tools Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum	Aluminum Alloy Casting	Titanium Alloys	Inconel *	Magnesium Alloy	Metal Matrix Composites
C-0.25%	C0.25%~0.45%	C0.45%~	SCM	~35 HRC	35~45 HRC	45~50 HRC	50~62 HRC	62~70 HRC	SUS	SKD SKS	FC	FCD	Cu	AL	AC			AZ91D		
⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙	⊙		⊙	⊙	⊙				⊙	⊙	⊙		

⊙ Excellent ○ Better

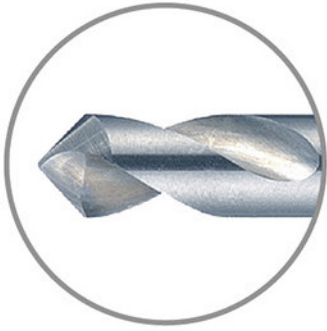


新焊接技術之機械刀具

New Brazing Technology for Cutting Tools

NCD series

定位鑽頭 Carbide Spotting Drills



■ (B) Composite Blank 複合式棒料 ■ (C) Solid Carbide 全鑄鋼

* (B) Not available for SUS with shrink fit chuck. (B) 不銹鋼柄 (SUS) 的複合式刀具請勿使用於攪結式刀桿。

Model No. 型號	Diameter (D) 刃徑	Flute Length (l) 溝長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存	Blank Type 棒料型式
NCD20200L060	2	6	32	2	✗	(B) (C)
NCD20300L080	3	8	38	3	✗	(B) (C)
NCD20400L100	4	10	50	4	✗	(B) (C)
NCD20500L130	5	13	50	5	✗	(B) (C)
NCD20600L130	6	13	50	6	✗	(B) (C)
NCD20800L200	8	20	60	8	✗	(B) (C)
NCD21000L220	10	22	75	10	✗	(B) (C)

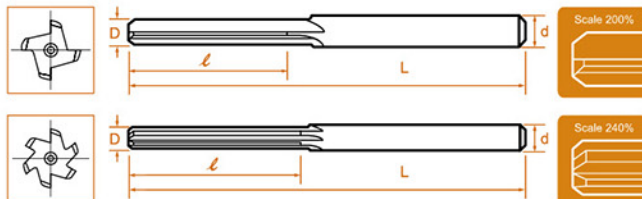
○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Low Carbon Steels	Medium Carbon Steels	High Carbon Steels	Alloy Steels	Hardened Steels	Quenched and Tempered Steels	Stainless Steels	Tools Steels	Cast Iron	Ductile Cast Iron	Copper Alloys	Aluminum	Aluminum Alloy Casting	Titanium Alloys	Inconel *
C-0.25%	C0.25%~0.45%	C0.45%~	SCM	~35 HRC 35~45 HRC	45~50 HRC 50~62 HRC 62~70 HRC	SUS	SKD SKS	FC	FCD	Cu	AL	AC		
⊙	⊙	⊙	⊙	⊙	⊙		⊙	⊙	⊙			⊙	⊙	⊙

⊙ Excellent ○ Better

Reamer series

Solid Carbide Reamer 全鎢鋼絞刀



Diameter (D) 刃徑	Number of Flutes 刃數	Flute Length (l) 溝長	Overall Length (L) 全長	Shank Diameter (d) 柄徑	Stock 庫存
0.5	4	5	50	3	※
1.0	4	14	50	3	※
1.5	4	16	50	3	※
2.0	4	20	50	3	※
2.5	4	22	50	3	※
3.0	4	25	50	3	※
3.5	4	28	50	4	※
4.0	4	28	50	4	※
4.5	6	28	50	6	※
5.0	6	32	50	6	※
5.5	6	32	50	6	※
6.0	6	32	50	6	※

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

Work Material 被削材	Low Carbon Steels Mild Steels S15C · S540C AISI1015 低碳素鋼·軟鋼		Carbon Steel S45C · S50C AISI 1045 · 1050 碳素鋼		Alloy Steels SCM · SNC · SNCM 合金鋼		Aluminum Alloy Castings A7075 · ADC DIN ALZnMgCu1.5D 鋁合金鑄物		Hardened Steels SKT · SKD 調質鋼		Cast Iron FC250 鑄鐵		Copper C1100 DIN ECu57 銅·銅合金			
	~40 HRC		~50 HRC													
Drilling Speed 切削速度	12~20m/min		10~16m/min		8~12m/min		15~30m/min		6~12m/min		4~10m/min		8~16m/min		10~25m/min	
REAMER DIA. (mm) 絞刀柄徑 (毫米)	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米	Feed 進給 (mm/rev) 毫米/轉	Removal Amount 去除量 (mm) 毫米
0.5	0.004~0.01	0.05~0.1	0.004~0.01	0.05~0.1	0.004~0.01	0.05~0.1	0.004~0.01	0.05~0.1	0.003~0.009	0.05~0.1	-	-	0.004~0.01	0.05~0.1	0.004~0.01	0.05~0.1
1	0.008~0.015	0.05~0.1	0.008~0.015	0.05~0.1	0.008~0.015	0.05~0.1	0.008~0.015	0.05~0.1	0.007~0.014	0.05~0.1	-	-	0.008~0.015	0.05~0.1	0.008~0.015	0.05~0.1
2	0.018~0.03	0.05~0.15	0.018~0.03	0.05~0.15	0.018~0.03	0.05~0.15	0.018~0.03	0.05~0.15	0.015~0.027	0.05~0.15	-	-	0.018~0.03	0.05~0.15	0.018~0.03	0.05~0.15
3	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2	0.023~0.04	0.1~0.2	0.012~0.03	0.03~0.08	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
4	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2	0.032~0.052	0.1~0.2	0.015~0.035	0.03~0.08	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
5	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.04~0.08	0.1~0.2	0.02~0.05	0.03~0.08	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2
6	0.06~0.12	0.1~0.2	0.06~0.12	0.1~0.2	0.06~0.12	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.1	0.1~0.2	0.025~0.055	0.03~0.08	0.06~0.12	0.1~0.2	0.06~0.12	0.1~0.2

Hardness Conversion Table 硬度換算表

Rockwell C scale hardness HRC	Vickers hardness HV	Brinell hardness 10 mm ball 29.42kN HB	Rockwell hardness		Shore hardness HS	Tensile Strength (Approx. Value) Mpa	Rockwell C scale hardness HRC
			A scale HRA	B scale HRB			
68	940	-	85.6	-	97	-	68
67	900	-	85	-	95	-	67
66	865	-	84.5	-	92	-	66
65	832	739	83.9	-	91	-	65
64	800	722	83.4	-	88	-	64
63	772	705	82.8	-	87	-	63
62	746	688	82.3	-	85	-	62
61	720	670	81.8	-	83	-	61
60	697	654	81.2	-	81	-	60
59	674	634	80.7	-	80	-	59
58	653	615	80.1	-	78	-	58
57	633	595	79.6	-	76	-	57
56	613	577	79.0	-	75	-	56
55	595	560	78.5	-	74	2075	55
54	577	543	78.0	-	72	5015	54
53	560	525	77.4	-	71	1950	53
52	544	512	76.8	-	69	1880	52
51	528	496	76.3	-	68	1820	51
50	513	481	75.9	-	67	1760	50
49	498	469	75.2	-	66	1695	49
48	484	455	74.7	-	64	1635	48
47	471	443	74.1	-	63	1580	47
46	458	432	73.6	-	62	1530	46
45	446	421	73.1	-	60	1480	45
44	434	409	72.5	-	58	1435	44
43	423	400	72.0	-	57	1385	43
42	412	390	71.5	-	56	1340	42
41	402	381	70.9	-	55	1295	41
40	392	371	70.4	-	54	1250	40
39	382	362	69.9	-	52	1215	39
38	372	353	69.4	-	51	1180	38
37	363	344	68.9	-	50	1160	37
36	354	336	68.4	(109.0)	49	1115	36
35	345	327	67.9	(108.5)	48	1080	35
34	336	319	67.4	(108.0)	47	1055	34
33	327	311	66.8	(107.5)	46	1025	33
32	318	301	66.3	(107.0)	44	1000	32
31	310	294	65.8	(106.0)	43	980	31
30	302	286	65.3	(105.5)	42	950	30
29	294	279	64.7	(104.5)	41	930	29
28	286	271	64.3	(104.0)	41	910	28
27	279	264	63.8	(103.0)	40	880	27
26	272	258	63.3	(102.5)	38	860	26
25	266	253	62.8	(101.5)	38	840	25
24	260	247	62.4	(101.0)	37	825	24
23	254	243	62.0	100.0	36	805	23
22	248	237	61.5	99.0	35	785	22
21	243	231	61.0	98.5	35	770	21
20	238	226	60.5	97.8	34	760	20

※ In above chart, figures with () are not commonly used. 以上的圖表中，在 () 內數值並不常用。

For Different Material Cutting Velocity Table Of End Mills

加工各種材質時銑刀切削速度參考表

(m/min)

Work Material 被削材	HSS End Mill HSS 銑刀	Power Metallurgy HSS TiAlN Coating End Mill 粉末 HSS 鍍鈦銑刀	Tungsten Carbide TiAlN Coating End Mill 鍍鈦鈷鎢銑刀	Tungsten Carbide TiAlN Coating End Mill (High Speed) 鍍鈦鈷鎢銑刀 (高速加工)
SS400	25	50	20~200	~500
炭素鋼 I (S10C~S30C)	20	40	20~200	~500
炭素鋼 II (S45C~S55C) 合金鋼 (SCM,SKD61,SNM)	17	30	20~200	~500
合金鋼 SKD11,SK3	15	25	20~200	~400
預硬鋼33~41 HRC (NAK55, HPM1, HPM2, KTSM40E, PDS5)"	15	25	20~200	~500
預硬鋼42~45 HRC (NAK80, HPM50, 2FG, SKT, DF2F, SKD61, KTSM40E, STAVAX)	15	25	20~200	~500
熱處理鋼 46~52 HRC (SKD61,SKD11,STAVAX)	-	-	20~200	~500
熱處理鋼 53~57HRC (SKD61, SKD11, STAVAX)	-	-	20~200	~300
熱處理鋼 58~62HRC (SKD11,SUJ2,SKS)	-	-	15~30	~100
沃斯田鐵系列不銹鋼 '301, 302, 303, 304, 309, 310, 316	12	20	20~80	~200
麻田散鐵系列不銹鋼 '403, 420, 431, 440, 405, 430	15	25	20~80	~400
析出硬化系謝不銹鋼 '630, 631	12	20	20~80	~400
鋁合金 (AD4C, A5052, A6063等)	20~80	100	200~600	~1000
Cu (銅)	40	60	20~80	~300
鎳 (Ni) 合金 (英高鍊 Inconel, 赫史特合金 Hastelloy, Waspalloy 等)	3~6	5~8	15~20	15~30
鈦合金 (Ti...6Al...4V)	20	30	80	150
鑄鐵 (FC250)	25	40	100	300

螺絲攻下孔徑對照表

公制粗牙 (M)

Specification 規格	Under Nuts 下孔徑
M2 x 0.4	1.6
M2.2 x 0.45	1.75
M2.3 x 0.4	1.90
M2.5 x 0.45	2.05
M2.6 x 0.45	2.15
M3 x 0.5	2.50
M3 x 0.6	2.40
M3.5 x 0.6	2.90
M4 x 0.7	3.30
M4 x 0.75	3.25
M4.5 x 0.75	3.75
M5 x 0.8	4.20
M5 x 0.9	4.10
M6 x 1.0	5.00
M7 x 1.0	6.00
M8 x 1.25	6.80
M9 x 1.25	8.50
M10 x 1.5	9.50
M11 x 1.5	10.20
M12 x 1.75	12.00
M14 x 2.0	14.00
M16 x 2.0	15.50
M18 x 2.5	17.50
M20 x 2.5	19.50
M22 x 2.5	21.00
M24 x 3.0	24.00
M27 x 3.0	26.50
M30 x 3.5	29.50
M33 x 3.5	32.00
M36 x 4.0	35.00
M39 x 4.0	37.50
M42 x 4.5	40.50
M45 x 4.5	43.00
M48 x 5.0	47.00
M52 x 5.0	47.00
M56 x 5.0	50.50
M60 x 5.5	54.50
M64 x 6.0	58.00

英制粗牙 (W)

Specification 規格	Under Nuts 下孔徑
W1 / 16 -60	1.20
W3 / 32 -48	1.80
W1 / 8 -40	2.60
W5 / 32 -32	3.10
W3 / 16 -24	3.60
W7 / 32 -24	4.50
W1 / 4 -20	5.10
W5 / 16 -18	6.50
W3 / 8 -16	7.90
W7 / 16 -14	9.30
W1 / 2 -12	10.50
W9 / 16 -12	12.00
W5 / 8 -11	13.50
W3 / 4 -10	16.50
W7 / 8 -9	19.25
W1 -8	22.00
W1 1/8 -7	24.75
W1 1/4 -7	27.75
W1 3/8 -6	30.20
W1 1/2 -6	33.50
W1 5/8 -5	35.50
W1 3/4 -5	38.50
W1 7/8 -4.5	41.50
W1 -4.5	44.50

英制粗牙 (UNC)

Specification 規格	Under Nuts 下孔徑
Nr.1 -60	1.50
Nr.2 -48	1.80
Nr.3 -40	2.10
Nr.4 -32	2.30
Nr.5 -24	2.60
Nr.6 -24	2.75
Nr.8 -20	3.50
Nr.10 -18	3.80
Nr.12 -16	4.50
1 / 4 -14	5.10
5 / 16 -12	6.50
3 / 8 -12	7.90
7 / 16 -11	9.30
1 / 2 -10	10.80
9 / 16 -9	12.20
5 / 8 -8	13.50
3 / 4 -7	16.50
7 / 8 -7	19.50
1 -6	22.25
1 1/4 -6	28.00
1 3/8 -5	31.00
1 1/2 -5	34.50
1 3/4 -4.5	39.00
2 -4.5	45.00

英制粗牙 (UNF)

Specification 規格	Under Nuts 下孔徑
Nr.0 -80	1.30
Nr.1 -72	1.60
Nr.2 -64	1.90
Nr.3 -56	2.10
Nr.4 -48	2.40
Nr.5 -44	2.70
Nr.6 -40	3.00
Nr.8 -36	3.50
Nr.10 -32	4.10
Nr.12 -28	4.70
1 / 4 -28	5.50
5 / 16 -24	6.90
3 / 8 -24	8.50
7 / 16 -20	9.90
1 / 2 -20	11.50
9 / 16 -18	12.90
5 / 8 -18	14.50
3 / 4 -16	17.50
7 / 8 -14	20.25
1 -12	23.25
1 1/8 -12	26.50
1 1/4 -12	29.50
1 3/8 -12	32.50
1 1/2 -12	36.00

無屑絲美制粗牙 (UNC)

Specification 規格	Under Nuts 下孔徑	Specification 規格	Under Nuts 下孔徑
Nr.1 -72	1.70	Nr.10 -32	4.35
Nr.2 -64	2.00	Nr.12 -28	5.00
Nr.3 -56	2.25	1 / 4 -28	5.75
Nr.4 -48	2.55	5 / 16 -24	7.30
Nr.5 -44	2.90	3 / 8 -24	8.80
Nr.6 -40	3.15	7 / 16 -20	10.30
Nr.8 -36	3.80	1 / 2 -20	11.80

無屑絲美制粗牙 (UNF)

Specification 規格	Under Nuts 下孔徑	Specification 規格	Under Nuts 下孔徑
Nr.0 -80	1.40	Nr.8 -36	3.85
Nr.1 -72	1.70	Nr.10 -32	4.45
Nr.2 -64	2.00	Nr.12 -28	5.05
Nr.3 -56	2.30	1 / 4 -28	5.95
Nr.4 -48	2.60	5 / 16 -24	7.40
Nr.5 -44	2.90	3 / 8 -24	9.00
Nr.6 -40	3.20	1 / 2 -20	12.10

無屑絲公制粗牙 (M)

Specification 規格	Under Nuts 下孔徑	Specification 規格	Under Nuts 下孔徑
M1 x 0.25	0.90	M2.5 x 0.45	2.30
M1.1 x 0.25	1.00	M2.6 x 0.45	2.40
M1.2 x 0.25	1.10	M3 x 0.5	2.75
M1.4 x 0.3	1.25	M3.5 x 0.6	3.20
M1.6 x 0.35	1.45	M4 x 0.7	3.65
M1.7 x 0.35	1.55	M5 x 0.8	4.60
M1.8 x 0.35	1.65	M6 x 1.0	5.50
M2 x 0.4	1.80	M8 x 1.25	7.35
M2.2 x 0.45	2.00	M10 x 1.5	9.25
M2.3 x 0.4	2.10	M12 x 1.75	11.10

美制管牙

Specification 規格	NPT 下孔徑	NPT 下孔徑
1 / 16 -27	6.20	6.35
1 / 8 -27	8.50	8.75
1 / 4 -18	11.00	11.15
3 / 8 -18	14.50	14.70
1 / 2 -14	18.00	18.15
3 / 4 -14	23.00	23.40
1 -11 1/2	29.00	29.40
1 1/4 -11 1/2	38.00	38.10
1 1/2 -11 1/2	44.00	44.45
2 -11 1/2	56.00	56.40

英制管牙

Specification 規格	NPT(Rc) 下孔徑	PS(Pp) 下孔徑	PF(G) 下孔徑
1 / 16 -28	6.30	6.50	6.70
1 / 8 -28	8.30	8.60	8.70
1 / 4 -19	11.00	11.50	11.70
3 / 8 -19	14.50	15.00	15.25
1 / 2 -14	18.10	18.50	19.00
5 / 8 -14			21.00
3 / 4 -14	23.50	24.00	24.50
7 / 8 -14			28.00
1 -11	29.60	30.25	30.50
1 1/8 -11			35.50
1 1/4 -11	38.10	39.00	39.50
1 1/2 -11	44.00	44.90	45.00
1 3/4 -11			51.00
2 -11	55.60	56.60	57.00

Deviation of Shafts To Be Used In Commonly Used Fits 常用配合軸之尺寸容許差

(Unit 單位 : $\mu\text{m} / \mu\text{m}$)

超元 Over	以下 Up to	e7	e8	e9	f6	f7	f8	g5	g6	g7	h6	h7	h8	h9	js5
—	—	-14 -24	-14 -28	-14 -39	-6 -12	-6 -16	-6 -20	-2 -6	-2 -8	0 -4	0 -6	0 -10	0 -14	0 -25	± 2
3	3	-20 -32	-20 -38	-20 -50	-10 -18	-10 -22	-10 -28	-4 -9	-4 -12	0 -5	0 -8	0 -12	0 -18	0 -30	± 2.5
6	6	-25 -40	-25 -47	-25 -61	-13 -22	-13 -28	-13 -35	-5 -11	-5 -14	0 -6	0 -9	0 -15	0 -22	0 -36	± 3
10	10	-32	-32	-32	-16	-16	-16	-6	-6	0	0	0	0	0	± 4
14	14	-50	-59	-75	-27	-34	-43	-14	-17	-8	-11	-18	-27	-43	± 4.5
18	18	-40	-40	-40	-20	-20	-20	-7	-7	0	0	0	0	0	± 4.5
24	24	-61	-73	-92	-33	-41	-53	-16	-20	-9	-13	-21	-33	-52	± 4.5
30	30	-50	-50	-50	-25	-25	-25	-9	-9	0	0	0	0	0	± 5.5
40	40	-75	-89	-112	-41	-50	-64	-20	-25	-11	-16	-25	-39	-62	± 5.5
50	50	-60	-60	-60	-30	-30	-30	-10	-10	0	0	0	0	0	± 6.5
65	65	-90	-106	-134	-49	-60	-76	-23	-29	-13	-19	-30	-46	-74	± 6.5
80	80	-72	-72	-72	-36	-36	-36	-12	-12	0	0	0	0	0	± 7.5
100	100	-107	-126	-159	-58	-71	-90	-27	-34	-15	-22	-35	-54	-87	± 7.5
120	120														
140	140	-85	-85	-85	-43	-43	-43	-14	-14	0	0	0	0	0	± 9
160	160	-125	-148	-158	-68	-83	-106	-32	-39	-18	-25	-40	-63	-100	± 9
180	180														
200	200	-100	-100	-100	-50	-50	-50	-15	-15	0	0	0	0	0	± 10
225	225	-146	-172	-215	-79	-96	-122	-35	-44	-20	-29	-46	-72	-115	± 10
超元 Over	以下 Up to	js6	js7	k5	k6	m5	m6	n6	E7	E8	E9	F6	F7	F8	G6
—	—	± 3	± 5	+4 0	+6 0	+6 +2	+8 +2	+10 +4	+24 +14	+28 +14	+39 +14	+12 +6	+16 +6	+20 +6	
3	3	± 4	± 6	+6 +1	+9 +1	+9 +4	+12 +4	+16 +8	+32 +20	+38 +20	+50 +20	+18 +10	+22 +10	+28 +10	
6	6	± 4.5	± 7	+7 +1	+10 +1	+12 +6	+15 +6	+19 +10	+40 +25	+47 +25	+61 +25	+22 +13	+28 +13	+35 +13	
10	10														
14	14	± 5.5	± 9	+9 +1	+12 +1	+15 +7	+18 +7	+32 +12	+50 +32	+59 +32	+75 +32	+27 +16	+34 +16	+43 +16	
18	18														
24	24	± 6.5	± 10	+11 +2	+15 +2	+17 +8	+21 +8	+28 +15	+61 +40	+73 +40	+92 +40	+33 +20	+41 +20	+53 +20	
30	30														
40	40	± 8	± 12	+13 +2	+18 +2	+20 +9	+25 +9	+33 +17	+75 +50	+89 +50	+112 +50	+41 +25	+50 +25	+64 +25	
50	50														
65	65	± 9.5	± 15	+15 +2	+21 +2	+24 +11	+30 +11	+39 +20	+90 +60	+106 +60	+134 +60	+49 +30	+60 +30	+76 +30	
80	80														
100	100	± 11	± 17	+18 +3	+25 +3	+28 +13	+35 +13	+45 +23	+170 +72	+126 +72	+159 +72	+58 +36	+71 +36	+90 +36	
120	120														
140	140														
160	160	± 12.5	± 20	+21 +3	+28 +3	+33 +15	+40 +15	+52 +27	+125 +85	+148 +85	+185 +85	+68 +43	+83 +43	+105 +43	
180	180														
200	200														
225	225	± 14.5	± 23	+24 +4	+33 +4	+37 +17	+46 +17	+60 +31	+146 +100	+172 +100	+215 +100	+79 +50	+96 +50	+122 +50	
超元 Over	以下 Up to	G7	H6	H7	H8	H9	H10	JS6	JS7	K6	K7	M6	M7	N6	N7
—	—	+12 +2	+6 0	+10 0	+4 0	+25 0	+40 0	± 3	± 5	0 -6	0 -10	-2 -8	-2 -12	-4 -10	-4 -14
3	3	+16 +4	+8 0	+12 0	+18 0	+30 0	+48 0	± 4	± 6	+2 -6	+3 -9	-1 -9	0 -12	-5 -13	-4 -16
6	6	+20 +5	+9 0	+15 0	+22 0	+36 0	+58 0	± 4.5	± 7	+2 -7	+5 -10	-3 -12	0 -15	-7 -16	-4 -19
10	10														
14	14	+24 +6	+11 0	+18 0	+27 0	+43 0	+70 0	± 5.5	± 9	+2 -9	+6 -12	-4 -15	0 -18	-9 -20	-5 -23
18	18														
24	24	+28 +7	+13 0	+21 0	+33 0	+52 0	+84 0	± 6.5	± 10	+2 -11	+6 -15	-4 -17	0 -21	-11 -24	-7 -28
30	30														
40	40	+34 +9	+16 0	+25 0	+39 0	+62 0	+100 0	± 8	± 12	+3 -13	+7 -18	-4 -20	0 -25	-12 -28	-8 -33
50	50														
65	65	+40 +10	+19 0	+30 0	+46 0	+74 0	+120 0	± 9.5	± 15	+4 -15	+9 -21	-5 -24	0 -30	-14 -33	-9 -39
80	80														
100	100	+47 +12	+22 0	+35 0	+54 0	+87 0	+140 0	± 11	± 17	+4 -18	+10 -25	-6 -28	0 -35	-16 -38	-10 -45
120	120														
140	140														
160	160	+54 +14	+25 0	+40 0	+63 0	+100 0	+160 0	± 12.5	± 20	+4 -21	+12 -28	-8 -33	0 -40	-20 -45	-12 -52
180	180														
200	200	+61 +15	+29 0	+46 0	+72 0	+115 0	+185 0	± 14.5	± 23	+5 -24	+13 -33	-8 -37	0 -46	-22 -51	-14 -60
225	225														

* In every step given in the table, the value on the upper side shows the upper deviation and the value on the lower side, the lower deviation.

Calculation Of Cutting Conditions 立銼刀切削條件計算公式

1 Velocity : V (m/min) 切削速度 (周速)

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

$\pi=3.14$ (the circular constant)
 D=Outside Diameter
 N=Spindle Speed

$\pi=3.14$ (圓周率)
 D=銼刀直徑 (mm)
 N=回轉數 (r.p.m)

2 Spindle Speed : N (r.p.m) 回轉數

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

V=Velocity
 $\pi=3.14$ (the circular constant)
 D=Outside Diameter

V=切削速度 (m/min)
 $\pi=3.14$ (圓周率)
 D=銼刀直徑 (mm)

3 Feed : F (mm/min) 進給速度

$$F = N \times Z \times Sz$$

N=Spindle Speed
 Z=Number of flutes
 Sz=Feed per tooth

N=回轉數 (r.p.m)
 Z=刃數
 Sz=每一刃的進刀量 (mm/刃)

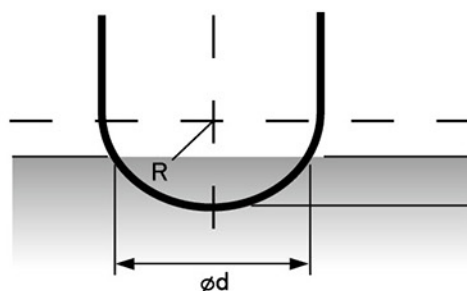
4 Feed per tooth : (mm) 每一刃的進刀量 (刃)

$$Sz = \frac{F}{N \times Z}$$

F=Feed
 N=Spindle Speed
 Z=Number of flutes

F=進給速度 (mm/min)
 N=回轉數 (r.p.m)
 Z=刃數

IN CASE OF BALL TYPE ENDMILLS



Endmill Virtual Diameter: $\phi d = 2\sqrt{Ad(2R-Ad)}$
球刀的實際切削直徑

Endmill Virtual Diameter 球刀的實際切削直徑

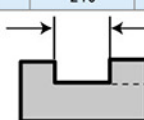
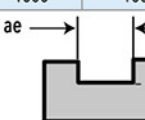
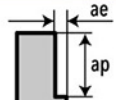
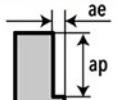
Ad: Milling Amount 軸方向切削量 (mm)

R \ Ad	0.01	0.02	0.03	0.04	0.05	0.1	0.15	0.2	0.25	0.3	0.4
R0.1	0.087	0.120	0.143	0.160	0.173	0.200	-	-	-	-	-
R0.15	0.108	0.150	0.180	0.204	0.224	0.283	0.300	-	-	-	-
R0.2	0.125	0.174	0.211	0.240	0.265	0.346	0.387	0.400	-	-	-
R0.25	0.140	0.196	0.237	0.271	0.300	0.400	0.458	0.490	0.500	-	-
R0.3	0.154	0.215	0.262	0.299	0.332	0.447	0.520	0.566	0.592	0.600	-
R0.4	0.178	0.250	0.304	0.349	0.387	0.529	0.624	0.693	0.742	0.775	0.800
R0.5	0.199	0.280	0.341	0.392	0.436	0.600	0.714	0.800	0.866	0.917	0.980
R0.6	0.218	0.307	0.375	0.431	0.480	0.663	0.794	0.894	0.975	1.039	1.131
R0.7	0.236	0.332	0.405	0.466	0.520	0.721	0.866	0.980	1.072	1.149	1.265
R0.8	0.252	0.356	0.434	0.500	0.557	0.775	0.933	1.058	1.162	1.249	1.386
R0.9	0.268	0.377	0.461	0.531	0.592	0.825	0.995	1.131	1.245	1.342	1.497
R1	0.282	0.398	0.486	0.560	0.624	0.872	1.054	1.200	1.323	1.428	1.600
R1.5	0.346	0.488	0.597	0.688	0.768	1.077	1.308	1.497	1.658	1.800	2.040
R2	0.399	0.564	0.690	0.796	0.889	1.249	1.520	1.744	1.936	2.107	2.400
R2.5	0.447	0.631	0.772	0.981	0.995	1.400	1.706	1.960	2.179	2.375	2.713
R3	0.489	0.692	0.846	0.977	1.091	1.536	1.873	2.154	2.398	2.615	2.993
R4	0.565	0.799	0.978	1.129	1.261	1.778	2.170	2.498	2.784	3.040	3.487
R5	0.632	0.894	1.094	1.262	1.411	1.990	2.431	2.800	3.122	3.412	3.919
R6	0.693	0.979	1.198	1.383	1.546	2.182	2.666	3.072	3.428	3.747	4.308

R \ Ad	0.5	0.6	0.7	0.8	0.9	1	1.5	2	2.5	3
R0.5	1.000	-	-	-	-	-	-	-	-	-
R0.6	1.183	1.200	-	-	-	-	-	-	-	-
R0.7	1.342	1.389	1.400	-	-	-	-	-	-	-
R0.8	1.483	1.549	1.587	1.600	-	-	-	-	-	-
R0.9	1.612	1.697	1.755	1.789	1.800	-	-	-	-	-
R1	1.732	1.833	1.908	1.960	1.990	2.000	-	-	-	-
R1.5	2.236	2.400	2.538	2.653	2.750	2.828	3.000	-	-	-
R2	2.646	2.857	3.040	3.200	3.341	3.464	3.873	4.000	-	-
R2.5	3.000	3.250	3.470	3.666	3.842	4.000	4.583	4.899	5.000	-
R3	3.317	3.600	3.852	4.079	4.285	4.472	5.196	5.657	5.916	6.000
R4	3.873	4.214	4.521	4.800	5.056	5.292	6.245	6.928	7.416	7.746
R5	4.359	4.750	5.103	5.426	5.724	6.000	7.141	8.000	8.660	9.165
R6	4.796	5.231	5.625	5.987	6.321	6.633	7.937	8.944	9.747	10.392

Tungsten Carbide End Mills series

2 Flute, Square Type Specifications 二刃立銑刀切削參數通用系列

Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、 工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、 模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、 模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、 耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Diameter 直徑 (m/m)	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分
	D1.0	20000	80	12500	50	11500	46	10000	40	4200
D2.0	12500	125	7500	75	6700	67	6000	60	2500	25
D3.0	9600	154	5900	94	5200	83	5000	80	2000	32
D4.0	8300	216	5000	130	4500	117	3900	101	1700	44
D5.0	7400	266	4500	162	4100	148	3600	130	1500	54
D6.0	6900	331	4200	202	3800	182	3300	158	1400	67
D8.0	5200	333	3200	205	2900	186	2500	160	1100	70
D10.0	4200	336	2500	200	2300	184	2000	160	900	72
D12.0	3400	340	2100	210	1900	190	1700	170	700	70
D16.0	2600	260	1600	160	1500	150	1300	130	550	55
D18.0	2300	230	1450	145	1300	130	1200	120	500	50
D20.0	2100	210	1250	125	1200	120	1000	100	450	45
Depth of cut (D: Dia.直徑) 切削量基準	 <p>ae=3.0mm ↓, ap=0.3D ↓ ae=3.0mm ↑, ap=0.5D ↓</p>					 <p>ae=3.0mm ↓ ap=0.15D ↓ ae=3.0mm ↑ ap=0.25D ↓</p>				
	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、 工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、 模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、 模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、 耐熱合金、鎳基合金	
<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)		
Diameter 直徑 (m/m)	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分	Speed 轉數 (min ⁻¹)	Feed 進給 mm/min 釐米/分
	D1.0	20000	100	12500	63	11500	58	10000	50	4200
D2.0	12500	150	7500	90	6700	80	6000	72	2500	30
D3.0	9600	192	5900	118	5200	104	5000	100	2000	40
D4.0	8300	266	5000	160	4500	144	3900	125	1700	54
D5.0	7400	326	4500	198	4100	180	3600	158	1500	66
D6.0	6900	414	4200	252	3800	228	3300	198	1400	84
D8.0	5200	416	3200	256	2900	232	2500	200	1100	88
D10.0	4200	420	2500	250	2300	230	2000	200	900	90
D12.0	3400	408	2100	252	1900	238	1700	204	700	84
D16.0	2600	312	1600	192	1500	180	1300	156	550	66
D18.0	2300	276	1450	174	1300	156	1200	144	500	60
D20.0	2100	252	1250	150	1200	144	1000	120	450	54
Depth of cut (D: Dia.直徑) 切削量基準	 <p>ae=0.05D ↓ (D<3) ae=0.1D ↓ (D≥3) ap=1.5D ↓</p>					 <p>ae=0.02D ↓, ap=1D ↓</p>				

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。

★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具偏擺精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

4 Flute, Square Type Specifications 四刃立銑刀切削參數通用系列

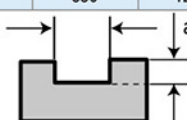
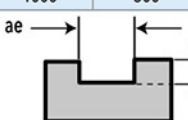
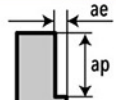
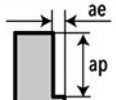
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
Cutting HRC 切削硬度	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Diameter 直徑	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D1.0	20000	160	12500	100	11500	92	10000	80	4200	34
D2.0	12500	250	7500	150	6700	134	6000	120	2500	50
D3.0	9600	307	5900	189	5200	166	5000	160	2000	64
D4.0	8300	432	5000	260	4500	234	3900	203	1700	88
D5.0	7400	533	4500	324	4100	295	3600	259	1500	108
D6.0	6900	662	4200	403	3800	365	3300	317	1400	134
D8.0	5200	666	3200	410	2900	371	2500	320	1100	141
D10.0	4200	672	2500	400	2300	368	2000	320	900	144
D12.0	3400	680	2100	420	1900	380	1700	340	700	140
D16.0	2600	520	1600	320	1500	300	1300	260	550	110
D18.0	2300	460	1450	290	1300	260	1200	240	500	100
D20.0	2100	420	1250	250	1200	240	1000	200	450	90
Depth of cut (D: Dia. 直徑) 切削量基準	<p>ae=3.0mm ↓, ap=0.3D ↓ ae=3.0mm ↑, ap=0.5D ↓</p>					<p>ae=3.0mm ↓, ap=0.15D ↓ ae=3.0mm ↑, ap=0.25D ↓</p>				
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
Cutting HRC 切削硬度	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Diameter 直徑	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D1.0	20000	200	12500	125	11500	115	10000	100	4200	42
D2.0	12500	300	7500	180	6700	161	6000	144	2500	60
D3.0	9600	384	5900	236	5200	208	5000	200	2000	80
D4.0	8300	531	5000	320	4500	288	3900	250	1700	109
D5.0	7400	651	4500	396	4100	361	3600	317	1500	132
D6.0	6900	828	4200	504	3800	456	3300	396	1400	168
D8.0	5200	832	3200	512	2900	464	2500	400	1100	176
D10.0	4200	840	2500	500	2300	460	2000	400	900	180
D12.0	3400	816	2100	504	1900	456	1700	408	700	168
D16.0	2600	624	1600	384	1500	360	1300	312	550	132
D18.0	2300	552	1450	348	1300	312	1200	288	500	120
D20.0	2100	504	1250	300	1200	288	1000	240	450	108
Depth of cut (D: Dia. 直徑) 切削量基準	<p>ae=0.05D ↓ (D<3) ae=0.1D ↓ (D≥3) ap=1.5D ↓</p>					<p>ae=0.02D ↓, ap=1D ↓</p>				

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。

★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具備攪精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

6 Flute, Square Type Specifications 六刃立銑刀切削參數通用系列

Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、 工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、 模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、 模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、 耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D1.0	20000	240	12500	150	11500	138	10000	120	4200	50
D2.0	12500	375	7500	225	6700	201	6000	180	2500	75
D3.0	9600	461	5900	283	5200	250	5000	240	2000	96
D4.0	8300	647	5000	390	4500	351	3900	304	1700	133
D5.0	7400	799	4500	486	4100	443	3600	389	1500	162
D6.0	6900	994	4200	605	3800	547	3300	475	1400	202
D8.0	5200	998	3200	614	2900	557	2500	480	1100	211
D10.0	4200	1008	2500	600	2300	552	2000	480	900	216
D12.0	3400	1020	2100	630	1900	570	1700	510	700	210
D16.0	2600	780	1600	480	1500	450	1300	390	550	165
D18.0	2300	690	1450	435	1300	390	1200	360	500	150
D20.0	2100	630	1250	375	1200	360	1000	300	450	135
Depth of cut (D: Dia. 直徑) 切削量基準										
	$ae=3.0\text{mm} \downarrow$, $ap=0.3D \downarrow$ $ae=3.0\text{mm} \uparrow$, $ap=0.5D \downarrow$					$ae=3.0\text{mm} \downarrow$ $ap=0.15D \downarrow$ $ae=3.0\text{mm} \uparrow$ $ap=0.25D \downarrow$				
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、 工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、 模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、 模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、 耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D1.0	20000	300	12500	188	11500	173	10000	150	4200	63
D2.0	12500	450	7500	270	6700	241	6000	216	2500	90
D3.0	9600	576	5900	354	5200	312	5000	300	2000	120
D4.0	8300	797	5000	480	4500	432	3900	374	1700	163
D5.0	7400	977	4500	594	4100	541	3600	475	1500	198
D6.0	6900	1242	4200	756	3800	684	3300	594	1400	252
D8.0	5200	1248	3200	768	2900	696	2500	600	1100	264
D10.0	4200	1260	2500	750	2300	690	2000	600	900	270
D12.0	3400	1224	2100	756	1900	684	1700	612	700	252
D16.0	2600	936	1600	576	1500	540	1300	468	550	198
D18.0	2300	828	1450	522	1300	468	1200	432	500	180
D20.0	2100	756	1250	450	1200	432	1000	360	450	162
Depth of cut (D: Dia. 直徑) 切削量基準										
	$ae=0.05D \downarrow (D<3)$ $ae=0.1D \downarrow (D\geq 3)$ $ap=1.5D \downarrow$					$ae=0.02D \downarrow$, $ap=1D \downarrow$				

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。

★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具備攪精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

2 Flute, Corner Radius Type Specifications 二刃圓鼻銼刀切削參數通用系列

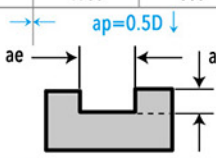
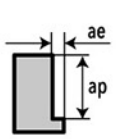
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)
D1.0	20000	80	12500	50	11500	46	10000	40	4200	17
D2.0	12500	125	7500	75	6700	67	6000	60	2500	25
D3.0	9600	154	5900	94	5200	83	5000	80	2000	32
D4.0	8300	199	5000	120	4500	108	3900	94	1700	41
D5.0	7400	266	4500	162	4100	148	3600	130	1500	54
D6.0	6900	331	4200	202	3800	182	3300	158	1400	134
D8.0	5200	333	3200	205	2900	186	2500	160	1100	136
D10.0	4200	336	2500	200	2300	184	2000	160	900	144
D12.0	3400	326	2100	202	1900	182	1700	163	700	112

Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)	(mm/min) (轉/分)	(mm/min) (mm/min)
D1.0	20000	100	12500	63	11500	58	10000	50	4200	21
D2.0	12500	150	7500	90	6700	80	6000	72	2500	30
D3.0	9600	192	5900	118	5200	104	5000	100	2000	40
D4.0	8300	266	5000	160	4500	144	3900	125	1700	54
D5.0	7400	326	4500	198	4100	180	3600	158	1500	66
D6.0	6900	414	4200	252	3800	228	3300	198	1400	168
D8.0	5200	416	3200	256	2900	232	2500	200	1100	165
D10.0	4200	420	2500	250	2300	230	2000	200	900	169
D12.0	3400	408	2100	252	1900	228	1700	204	700	137

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。
★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具備攪精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

4 Flute, Corner Radius Type Specifications 四刃圓鼻銑刀切削參數通用系列

Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金		
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)		
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	
	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	
D1.0	20000	160	12500	100	11500	92	10000	80	4200	34	
D2.0	12500	250	7500	150	6700	134	6000	120	2500	50	
D3.0	9600	307	5900	189	5200	166	5000	160	2000	64	
D4.0	8300	398	5000	240	4500	216	3900	187	1700	82	
D5.0	7400	533	4500	324	4100	295	3600	259	1500	108	
D6.0	6900	662	4200	403	3800	365	3300	317	1400	269	
D8.0	5200	666	3200	410	2900	371	2500	320	1100	273	
D10.0	4200	672	2500	400	2300	368	2000	320	900	288	
D12.0	3400	653	2100	403	1900	365	1700	326	700	224	
Depth of cut (D: Dia. 直徑) 切削量 基準	$ap=1D \downarrow$		$ap=0.5D \downarrow$				$ap=0.2D \downarrow$				
											
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金		
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)		
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	
	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	(m/min) (轉/分)	(mm/min) 釐米/分	
D1.0	20000	200	12500	125	11500	115	10000	100	4200	42	
D2.0	12500	300	7500	180	6700	161	6000	144	2500	60	
D3.0	9600	384	5900	236	5200	208	5000	200	2000	80	
D4.0	8300	531	5000	320	4500	288	3900	250	1700	109	
D5.0	7400	651	4500	396	4100	361	3600	317	1500	132	
D6.0	6900	828	4200	504	3800	456	3300	396	1400	336	
D8.0	5200	832	3200	512	2900	464	2500	400	1100	330	
D10.0	4200	840	2500	500	2300	460	2000	400	900	338	
D12.0	3400	816	2100	504	1900	456	1700	408	700	274	
Depth of cut (D: Dia. 直徑) 切削量 基準	$ae=0.2D \downarrow$		$ap=1.5D \downarrow$				$ae=0.05D \downarrow$				$ap=1D \downarrow$
											

- ★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。
- ★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具偏擺精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

6 Flute, Corner Radius Type Specifications 六刃圓鼻銑刀切削參數通用系列

Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分
D1.0	20000	240	12500	150	11500	138	10000	120	4200	50
D2.0	12500	375	7500	225	6700	201	6000	180	2500	75
D3.0	9600	461	5900	283	5200	250	5000	240	2000	96
D4.0	8300	598	5000	360	4500	324	3900	281	1700	122
D5.0	7400	799	4500	486	4100	443	3600	389	1500	162
D6.0	6900	994	4200	605	3800	547	3300	475	1400	403
D8.0	5200	998	3200	614	2900	557	2500	480	1100	409
D10.0	4200	1008	2500	600	2300	552	2000	480	900	432
D12.0	3400	979	2100	605	1900	547	1700	490	700	336

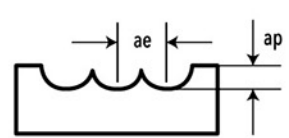
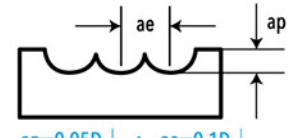
Work Material 被削材	Carbon steel, Alloy steel, Tool steel 炭素鋼、合金鋼、工具鋼、模具鋼		Alloy steel, Tool steel, Hardened steel 合金鋼、工具鋼、模具鋼、熱處理鋼		Alloy steel, Tool steel, Stainless steel, Hardened steel 合金鋼、工具鋼、不銹鋼、模具鋼、熱處理鋼		Hardened steel, Titanium Alloy 熱處理鋼、鈦合金		Hardened steel, Hardened Alloy steel, Ni-Alloy 熱處理鋼、耐熱合金、鎳基合金	
	<30HRC (硬度30度以下)		30~35HRC (硬度30~35度)		35~40HRC (硬度35~40度)		40~45HRC (硬度40~45度)		45~50HRC (硬度45~50度)	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分	(mm/min) (轉/分)	(mm/min) 釐米/分
D1.0	20000	300	12500	188	11500	173	10000	150	4200	63
D2.0	12500	450	7500	270	6700	241	6000	216	2500	90
D3.0	9600	576	5900	354	5200	312	5000	300	2000	120
D4.0	8300	797	5000	480	4500	432	3900	374	1700	163
D5.0	7400	977	4500	594	4100	541	3600	475	1500	198
D6.0	6900	1242	4200	756	3800	684	3300	594	1400	504
D8.0	5200	1248	3200	768	2900	696	2500	600	1100	495
D10.0	4200	1260	2500	750	2300	690	2000	600	900	508
D12.0	3400	1224	2100	756	1900	684	1700	612	700	412

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。
★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具備攪精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

Ball Nose Type Specifications 通用系列球頭銑刀切削參數

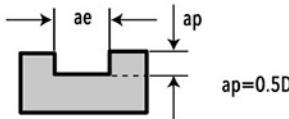
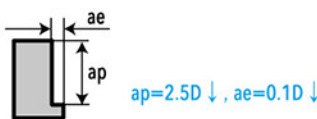
Work Material 被削材	Carbon steel, Alloy steel, Tool steel (<30HRC) 炭素鋼、合金鋼、工具鋼 (硬度30度以下)				Alloy steel, Tool steel, Stainless steel, Hardened steel (30~45HRC) 合金鋼、工具鋼、不鏽鋼、熱處理鋼 (HRC30-45度)				Hardened steel (40~50HRC) 熱處理鋼 (硬度40~50度)			
	Contour Cutting 等高切削		Curved Cutting 曲面切削		Contour Cutting 等高切削		Curved Cutting 曲面切削		Contour Cutting 等高切削		Curved Cutting 曲面切削	
Cutting HRC 切削硬度	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
	(m/min)	(mm/min)	(m/min)	(mm/min)	(m/min)	(mm/min)	(m/min)	(mm/min)	(m/min)	(mm/min)	(m/min)	(mm/min)
R0.25	45000	900	31000	620	35700	571	25000	400	19000	228	13000	156
R0.5	22000	880	15500	620	17800	570	12500	400	9500	209	6600	145
R0.75	15000	900	10600	636	12100	581	8500	408	6400	205	4500	144
R1.0	11400	228	8000	160	9100	637	6400	448	4800	269	3400	190
R1.25	9100	910	6400	640	7100	639	5000	450	3800	289	2700	205
R1.5	7600	912	5300	636	6000	672	4200	470	3200	301	2200	207
R2.0	5700	1140	4000	800	4600	791	3200	550	2300	322	1600	224
R2.5	4600	1104	3200	768	3600	720	2500	500	1900	331	1300	226
R3.0	3900	1014	2700	702	3000	720	2100	504	1600	310	1100	213
R4.0	2900	928	2000	640	2300	672	1600	467	1100	264	770	185
R5.0	2300	828	1600	576	1900	646	1300	442	950	247	660	172

Depth of cut (D: Dia. 直徑) 切削量 基準	 $ae=0.2D \downarrow$, $ap=0.05D \downarrow$ (R<0.5) $ap=0.1D \downarrow$ (R≥0.5)		 $ap=0.05D \downarrow$, $ae=0.1D \downarrow$	

- ★初次試用本刀具時，進給速度依上述數據之50%試切削。切削狀況穩定後，再將切削速度、進給量逐一調升。
- ★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具備攪精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

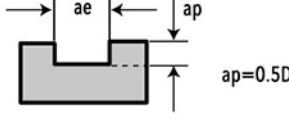
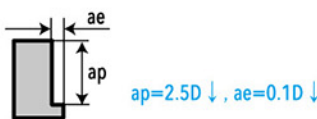
2 Flute, Square Type For Aluminum 二刃鋁用系列立銑刀切削參數

Work Material 被削材	Aluminum 純鋁 1070		Aluminum Alloy Cu-Mg series 鋁合金 Cu-Mg系 2014		Aluminum Alloy Si series 鋁合金 Si系 4032		Aluminum Alloy Mg series 鋁合金 Mg系 5052		Aluminum Alloy Mg-Si series 鋁合金 Mg-Si系 6061		Aluminum Alloy Zn-Mg series 鋁合金 Zn-Mg系 7075		Aluminum Alloy Casting 鑄造鋁合金 Ac85	
	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D3.0	30000	600	25000	500	2500	100	12000	240	20000	320	25000	400	15000	330
D4.0	22000	660	19000	684	1900	137	9500	342	15000	450	19000	570	11000	396
D5.0	18000	720	15000	660	1500	135	7500	330	12000	432	15000	540	9000	396
D6.0	15000	660	13000	676	1300	138	6000	312	10000	420	13000	546	7500	420
D8.0	11000	660	9500	665	950	205	5000	350	7500	420	9500	532	5500	462
D10.0	8500	850	7500	810	750	201	4000	432	6000	528	7500	660	4500	450
D12.0	7500	810	6000	780	600	168	3000	390	4500	468	6000	624	3500	420
D16.0	5500	660	5000	700	500	150	2500	350	3800	456	5000	600	2800	336
D20.0	4500	585	4000	640	400	144	2000	320	3000	360	4000	480	2500	300
Depth of cut (D:Dia.直徑) 切削量 基準	 <p style="text-align: right;">ap=0.5D</p>													
Work Material 被削材	Aluminum 純鋁 1070		Aluminum Alloy Cu-Mg series 鋁合金 Cu-Mg系 2014		Aluminum Alloy Si series 鋁合金 Si系 4032		Aluminum Alloy Mg series 鋁合金 Mg系 5052		Aluminum Alloy Mg-Si series 鋁合金 Mg-Si系 6061		Aluminum Alloy Zn-Mg series 鋁合金 Zn-Mg系 7075		Aluminum Alloy Casting 鑄造鋁合金 Ac85	
	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D3.0	30000	600	25000	500	2500	100	12000	240	20000	400	25000	500	15000	300
D4.0	22000	660	19000	684	1900	137	9500	342	15000	540	19000	570	11000	330
D5.0	18000	720	15000	660	1500	135	7500	330	12000	528	15000	540	9000	324
D6.0	15000	660	13000	676	1300	138	6000	312	10000	520	13000	572	7500	330
D8.0	11000	660	9500	665	950	205	5000	350	7500	525	9500	570	5500	330
D10.0	8500	850	7500	810	750	201	4000	432	6000	648	7500	540	4500	324
D12.0	7500	810	6000	780	600	168	3000	390	4500	585	6000	540	3500	315
D16.0	5500	660	5000	700	500	150	2500	350	3800	532	5000	600	2800	336
D20.0	4500	585	4000	640	400	144	2000	320	3000	480	4000	520	2500	325
Depth of cut (D:Dia.直徑) 切削量 基準	 <p style="text-align: right;">ap=2.5D ↓ , ae=0.1D ↓</p>													

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。
★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具偏擺精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

3 Flute, Square Type For Aluminum 三刃鋁用系列立銑刀切削參數

Work Material 被削材	Aluminum 純鋁 1070		Aluminum Alloy Cu-Mg series 鋁合金 Cu-Mg系 2014		Aluminum Alloy Si series 鋁合金 Si系 4032		Aluminum Alloy Mg series 鋁合金 Mg系 5052		Aluminum Alloy Mg-Si series 鋁合金 Mg-Si系 6061		Aluminum Alloy Zn-Mg series 鋁合金 Zn-Mg系 7075		Aluminum Alloy Casting 鑄造鋁合金 Ac85	
	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D3.0	30000	900	25000	750	2500	150	12000	360	20000	480	25000	600	15000	495
D4.0	22000	990	19000	1026	1900	205	9500	513	15000	675	19000	855	11000	594
D5.0	18000	1080	15000	990	1500	203	7500	495	12000	648	15000	810	9000	594
D6.0	15000	990	13000	1014	1300	207	6000	468	10000	630	13000	819	7500	630
D8.0	11000	990	9500	998	950	308	5000	525	7500	630	9500	798	5500	693
D10.0	8500	1275	7500	1215	750	302	4000	648	6000	792	7500	990	4500	675
D12.0	7500	1215	6000	1170	600	252	3000	585	4500	702	6000	936	3500	630
D16.0	5500	990	5000	1050	500	225	2500	525	3800	684	5000	900	2800	504
D20.0	4500	878	4000	960	400	216	2000	480	3000	540	4000	720	2500	450
Depth of cut (D: Dia.直徑) 切削量 基準														
Work Material 被削材	Aluminum 純鋁 1070		Aluminum Alloy Cu-Mg series 鋁合金 Cu-Mg系 2014		Aluminum Alloy Si series 鋁合金 Si系 4032		Aluminum Alloy Mg series 鋁合金 Mg系 5052		Aluminum Alloy Mg-Si series 鋁合金 Mg-Si系 6061		Aluminum Alloy Zn-Mg series 鋁合金 Zn-Mg系 7075		Aluminum Alloy Casting 鑄造鋁合金 Ac85	
	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給	Speed 轉數	Feed 進給
(m/m)	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分	(min ⁻¹) 轉/分	mm/min 釐米/分
D3.0	30000	900	25000	750	2500	150	12000	360	20000	600	25000	750	15000	450
D4.0	22000	990	19000	1026	1900	205	9500	513	15000	810	19000	855	11000	495
D5.0	18000	1080	15000	990	1500	203	7500	495	12000	792	15000	810	9000	486
D6.0	15000	990	13000	1014	1300	207	6000	468	10000	780	13000	858	7500	495
D8.0	11000	990	9500	998	950	308	5000	525	7500	788	9500	855	5500	495
D10.0	8500	1275	7500	1215	750	302	4000	648	6000	972	7500	810	4500	486
D12.0	7500	1215	6000	1170	600	252	3000	585	4500	878	6000	810	3500	473
D16.0	5500	990	5000	1050	500	225	2500	525	3800	798	5000	900	2800	504
D20.0	4500	878	4000	960	400	216	2000	480	3000	720	4000	780	2500	488
Depth of cut (D: Dia.直徑) 切削量 基準														

★初次試用本刀具時，進給速度依上述數據之50%試切削，切削狀況穩定後，再將切削速度、進給量逐一調升。
★請採用高精度高剛性與動態平衡較佳的夾頭組，刀具偏擺精度0.01mm時，請改善後再切削。

Tungsten Carbide End Mills series

End Mill Damage Analysis 立銑刀故障分析與對策參考

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 → 將立銑刀的刀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
		• 先端形狀不適合	→ 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 • 切削液不適、不足	→ 減慢切削速度 → 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 → 除去熔附物 → 更換切削液
		• 刃部有熔附物 • 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
• 伸出長度過長			→ 使用刀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 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 → 變更為合適的切削液
		• 切削液不適	→ 變換給油方式
	再研磨時期不適	• 再研磨時期不適	→ 對再研磨時間進行管理
		• 振動、顫振	→ 加強加工工件安裝用具 → 實現內部組織的平均化
		• 工件材料的缺陷	→ 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 • 切削刃鈍化 • 切削液劣化	→ 減少進給量 → 實施再研磨 → 變更切削液
	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



The World Pioneer New Brazing Technology

Taps & Thread Milling Tools

Series

絲攻及銑牙刀系列



Applicable Industry:

3C、Precision Machinery、
Automotive Industry、Mold Manufacturing...

適用行業：3C、精密機械、汽車工業、模具製造 等等...

新焊接技術之絲攻及銑牙刀

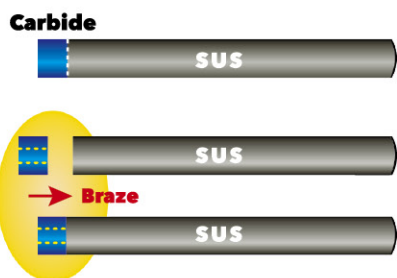
Taps & Thread Milling Tools for precision operation



A Type 絲攻的新焊接技術

New Brazing Technology for Taps 絲攻的新焊接技術

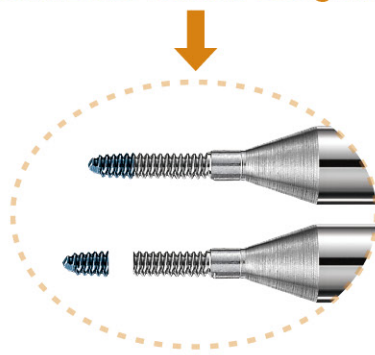
- ✓ New Brazing Technology - Carbide and SUS. 新型焊接技術 - 鎢鋼和不銹鋼。
- ✓ Preserve Carbide Hardness and SUS Roughness. 保留鎢鋼硬質硬度和布織鋼粗糙度。
- ✓ Best Solution for Diversities of Tapping Machines. 最好的攻牙機解決方案之多樣性。



Diminish the material of WC in order to reduce the cost.
Maintain the hardness of WC and the **Toughness** of SUS.



Special Braze for New Design 新設計的特殊焊接技術



Material Savings
節省材料 降低成本



NEW!
效益

Cost Down
降低成本

- Guarantee the Tip is **Sumitomo** Material.
保證使用端是住友鎢鋼材料。
- Cost Down **30%** or More.
成本下降了30%或更多。

• For **Mass Production**.

可大量生產。

Production Capacity

- By Daily : Max. **22,500** pcs
- By Month : **675,000** pcs

Qualified for Taps 合格的絲攻

- Spec 規格 :
 - **Miniature** 微型 : S0.5~0.9mm
 - **Metric** 公制 : M1.0~30 mm
- Type 型式 : Spiral Pointed 先端型 / Spiral Fluted 螺旋型 / Roll 擠壓型 / Straight Fluted 直刃型



Patent	專利
America	美國
Germany	德國
Japan	日本
Taiwan	台灣
Korea	韓國
China	中國





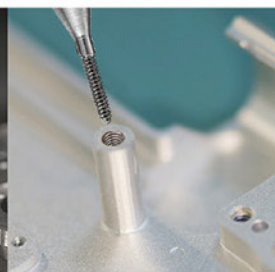
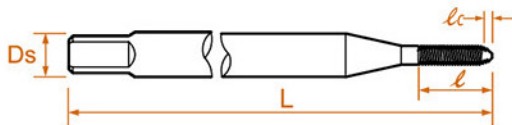
新銲接技術之絲攻及銑牙刀
Taps & Thread Milling Tools for precision operation

FL series

擠壓無屑型絲攻 **Roll Tap**

Tap Features 絲攻功能

- Thread Size 螺紋尺寸 : S0.5~S0.9 / M1~M20
- Reduce resistance of broken. 降低抗折
- Material 材料 : Carbide+Stainless. 鎢鋼+不銹鋼
- Enhance precision & percentage of thread 提高精度和螺紋的百分比
- Guaranteed 25000 hole /pc for Aluminum alloy on CNC machine.
數控機床上的鋁合金保證25000孔 / 件
- Cost down & Increase life expectancy. 降低成本與增加壽命



FL series

Micro Roll Tap Series 微小徑擠壓無屑型絲攻系列							
Thread Size 螺紋尺寸	TAP Limit 精度	lc 無效牙	(L) Overall Length 全長	(l) Thread Length 螺紋長	(Ds) Shank Diameter 柄徑	Material 材質	Stock 庫存
S 0.5 x 0.125	TR2	2P	30	2	3	Carbide+SUS	✗
S 0.6 x 0.15	TR2	2P	30	2.5	3	Carbide+SUS	✗
S 0.7 x 0.175	TR2	2P	30	2.5	3	Carbide+SUS	✗
S 0.8 x 0.2	TR2	2P	30	3	3	Carbide+SUS	✗
S 0.8 x 0.15	TR2	2P	30	5	3	Carbide+SUS	✗
S 0.9 x 0.225	TR2	2P	30	3	3	Carbide+SUS	✗

○ Standard 標準品 ✗ Produce by order 訂製品 (Unit 單位: mm)

Roll Tap Series 擠壓無屑型絲攻系列							
Thread Size 螺紋尺寸	TAP Limit 精度	lc 無效牙	(L) Overall Length 全長	(l) Thread Length 螺紋長	(Ds) Shank Diameter 柄徑	Material 材質	Stock 庫存
M 1 x 0.25	TR4	2P	30	5	3	Carbide+SUS	○
M 1.2 x 0.25	TR4	2P	30	5	3	Carbide+SUS	○
M 1.4 x 0.3	TR4	2P	35	6.5	3	Carbide+SUS	○
M 1.6 x 0.35	TR4	2P	35	7	3	Carbide+SUS	✗
M 1.7 x 0.35	TR4	2P	35	8	3	Carbide+SUS	✗
M 2 x 0.4	TR4	2P	40	8	3	Carbide+SUS	○
M 2.3 x 0.4	TR4	2P	40	9	3	Carbide+SUS	✗
M 2.5 x 0.45	TR4	2P	45	9	3	Carbide+SUS	✗
M 2.6 x 0.45	TR4	2P	45	9.5	3	Carbide+SUS	✗
M 3 x 0.5	TR5	2P	45	9	4	Carbide+SUS	○
M 3.5 x 0.6	TR4	2P	50	7.5	4	Carbide+SUS	○
M 4 x 0.7	TR6	2P	50	8.5	✗ 5/6	Carbide+SUS	○
M 5 x 0.8	TR6	2P	60	9.5	✗ 5.5/6	Carbide+SUS	○
M 6 x 1.0	TR7	2P	60	12	6	Carbide+SUS	○
M 7 x 1.0	TR6	2P	65	12	✗ 6.2/8	Carbide+SUS	○
M 8 x 1.0	TR7	2P	70	12	✗ 6.2/8	Carbide+SUS	○
M 8 x 1.25	TR7	2P	70	15	✗ 6.2/8	Carbide+SUS	○
M 10 x 1.0	TR7	2P	75	12	✗ 7/8	Carbide+SUS	○
M 10 x 1.25	TR7	2P	75	15	✗ 7/8	Carbide+SUS	○
M 10 x 1.5	TR7	2P	75	18	✗ 7/8	Carbide+SUS	○
M 12 x 1.0	TR7	2P	80	12	✗ 8.5/10	Carbide+SUS	○
M 12 x 1.25	TR7	2P	80	15	✗ 8.5/10	Carbide+SUS	○
M 12 x 1.5	TR7	2P	80	18	✗ 8.5/10	Carbide+SUS	○
M 12 x 1.75	TR8	2P	80	21	✗ 8.5/10	Carbide+SUS	○
M 14 x 1.5	TR9	2P	90	18	✗ 10.5/12	Carbide+SUS	○
M 14 x 2.0	TR10	2P	90	24	✗ 10.5/12	Carbide+SUS	○
M 16 x 1.5	TR9	2P	95	18	✗ 12.5/14	Carbide+SUS	○
M 16 x 2.0	TR10	2P	95	24	✗ 12.5/14	Carbide+SUS	○
M 18 x 1.5	TR10	2P	100	18	14	Carbide+SUS	○
M 18 x 2.5	TR11	2P	100	30	14	Carbide+SUS	○
M 20 x 1.5	TR10	2P	105	18	14 / 15 ✗	Carbide+SUS	○
M 20 x 2.5	TR11	2P	105	30	14 / 15 ✗	Carbide+SUS	○

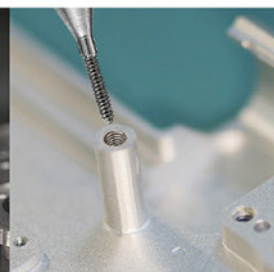
○ Standard 標準品 ✗ Produce by order 訂製品 (Unit 單位: mm)

Low Carbon Steels 低碳鋼		Medium Carbon Steels 中碳鋼		High Carbon Steels 高碳鋼		Alloy Steels 合金鋼		Hardened Steels 硬化鋼			Stainless Steels 不銹鋼	Tool Steels 工具鋼	Cast Steels 鑄鋼	Cast Iron 鑄鐵	Ductile Cast Iron 韌性鑄鐵	
C~0.25%		C0.25%~0.45%		C~0.45%		SCM		25~45 HRC	45~55 HRC		50~60 HRC	SUS	SKD	SC	FC	FCD
○	○	○	○	○	○	○	○				○					
Copper 銅	Brass 黃銅	Brass Casting 黃銅鑄物		Bronze 青銅	Aluminum Rolled 鋁擠壓材質		Aluminum Alloy Casting 鋁合金		Magnesium Alloy Casting 鎂合金	Zinc Alloy Casting 亞鉛合金	Titanium Alloy 鈦合金	Nickel Alloy Ni基合金	Thermo Setting Plastic 熱硬化性塑膠		Thermo Plastic 熱可塑性塑膠	
Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC									
○	○	○		○	○		○									

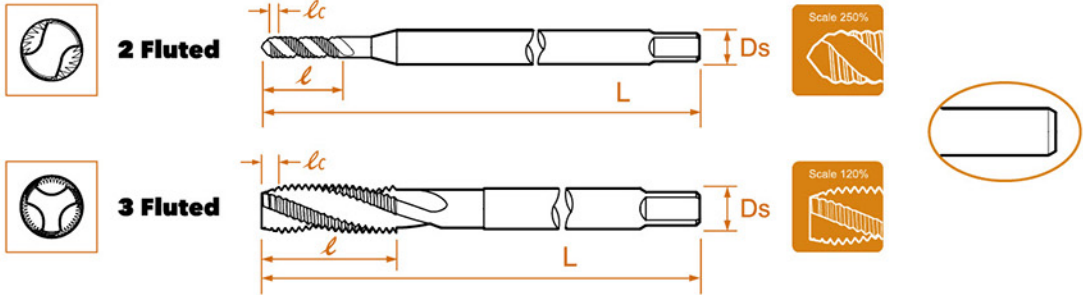
○ Excellent ○ Better

Tap Features 絲攻功能

- For tap is capping of small size tapping operation efficiently in precision components for IT industrial, etc.
 適用精密機器 · IT行業零配件的精密攻牙加工—效率高、精度佳。
- Suitable for Aluminum Alloy Casting, Magnesium Alloy Casting, Copper and Stainless Steel.
 適合鋁合金鑄造 · 鎂合金鑄件 · 銅合金及不銹鋼。



SF series



Thread Size 螺紋尺寸	TAP Limit 精度	lc 無效牙	(L) Overall Length 全長	(l) Thread Length 螺紋長	ln 槽長	(Ds) Shank Diameter 柄徑	Material 材質	Stock 庫存
M 1 x 0.25	T01	1.5P	30	7	8.5	3	Carbide+SUS	○
M 1.2 x 0.25	T01	1.5P	32	8	9.5	3	Carbide+SUS	○
M 1.4 x 0.3	T01	1.5P	34	9	11.5	3	Carbide+SUS	○
M 1.6 x 0.35	T01	1.5P	36	10	13.5	3	Carbide+SUS	✘
M 1.7 x 0.35	T01	1.5P	36	11	13.5	3	Carbide+SUS	✘
M 1.8 x 0.35	T01	1.5P	36	11	13.5	3	Carbide+SUS	✘
M 2 x 0.4	T01	2.5P	40	12	16	3	Carbide+SUS	○
M 2.3 x 0.4	T01	2.5P	40	13	20	3	Carbide+SUS	✘
M 2.5 x 0.45	T01	2.5P	45	14	21	3	Carbide+SUS	✘
M 2.6 x 0.45	T01	2.5P	45	14	21	3	Carbide+SUS	✘
M 3 x 0.5	T02	2.5P	45	4	19	4	Carbide+SUS	○
M 3.5 x 0.6	T02	2.5P	50	4.8	20	4	Carbide+SUS	✘
M 4 x 0.7	T02	2.5P	50	5.6	21	6 / 5 ✘	Carbide+SUS	✘
M 5 x 0.8	T02	2.5P	60	6.4	24	6 / 5.5 ✘	Carbide+SUS	✘
M 6 x 1	T02	2.5P	60	8	29	6	Carbide+SUS	✘
M 8 x 1	T02	2.5P	70	10	37	8 / 6.2 ✘	Carbide+SUS	✘
M 8 x 1.25	T03	2.5P	70	10	37	8 / 6.2 ✘	Carbide+SUS	✘
M 10 x 1	T02	2.5P	75	12	41	8 / 7 ✘	Carbide+SUS	✘
M 10 x 1.25	T03	2.5P	75	12	41	8 / 7 ✘	Carbide+SUS	✘
M 10 x 1.5	T03	2.5P	75	12	41	8 / 7 ✘	Carbide+SUS	✘
M 12 x 1.25	T03	2.5P	80	14	48	10 / 8.5 ✘	Carbide+SUS	✘
M 12 x 1.5	T03	2.5P	80	14	48	10 / 8.5 ✘	Carbide+SUS	✘
M 12 x 1.75	T03	2.5P	80	14	48	10 / 8.5 ✘	Carbide+SUS	✘

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Low Carbon Steels 低碳鋼		Medium Carbon Steels 中碳鋼		High Carbon Steels 高碳鋼		Alloy Steels 合金鋼		Hardened Steels 硬化鋼			Stainless Steels 不銹鋼	Tool Steels 工具鋼	Cast Steels 鑄鋼	Cast Iron 鑄鐵	Ductile Cast Iron 韌性鑄鐵
C~0.25%		C0.25%~0.45%		C~0.45%		SCM		25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	FC	FCD
Copper 銅	Brass 黃銅	Brass Casting 黃銅鑄物	Bronze 青銅	Aluminum Rolled 鋁擠壓材質	Aluminum Alloy Casting 鋁合金	Magnesium Alloy Casting 鎂合金	Zinc Alloy Casting 亞鉛合金	Titanium Alloy 鈦合金	Nickel Alloy 基合金	Thermo Setting 熱硬化性塑膠	Thermo Plastic 熱可塑性塑膠				
Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC								

⊙ Excellent ○ Better



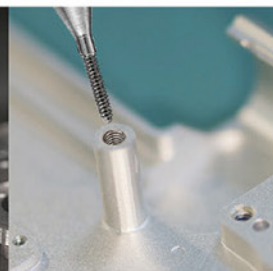
新焊接技術之絲攻及銑牙刀
Taps & Thread Milling Tools for precision operation

SP series

先端型絲攻 **Spiral Pointed Tap**

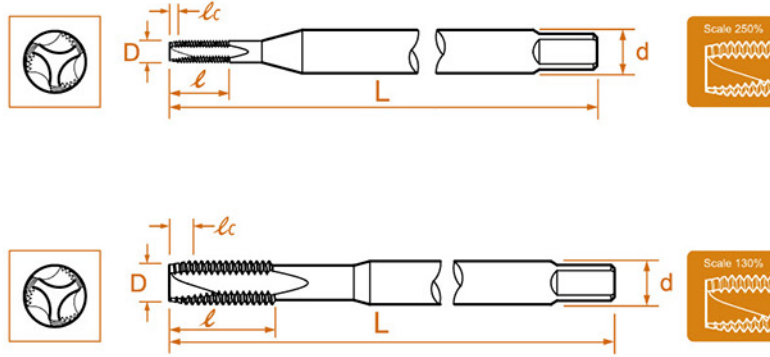
Tap Features 絲攻功能

- For tap is capping of small size tapping operation efficiently in precision components for IT industrial, etc.
適用精密機器・IT行業零配件的精密攻牙加工—效率高、精度佳。
- Suitable for Aluminum Alloy Casting, Magnesium Alloy Casting, Copper and Stainless Steel.
適合鋁合金鑄造・鎂合金鑄件・銅合金及不銹鋼。



SP series

Spiral Pointed Tap 先端型絲攻



Thread Size 螺紋尺寸	TAP Limit 精度	lc 無效牙	(L) Overall Length 全長	(l) Thread Length 螺紋長	ln 槽長	(Ds) Shank Diameter 柄徑	Material 材質	Stock 庫存
M3 x 0.5	T03	6P	45	11	19	4	Carbide+SUS	○
M4 x 0.7	T03	6P	50	13	21	6/5 ※	Carbide+SUS	※
M5 x 0.8	T03	6P	60	16	24	6/5.5 ※	Carbide+SUS	※
M6 x 1.0	T03	6P	60	19	29	6	Carbide+SUS	※
M8 x 1.25	T04	6P	70	22	37	8/6.2 ※	Carbide+SUS	※
M10 x 1.25	T04	6P	75	24	41	8/7 ※	Carbide+SUS	※
M10 x 1.5	T04	6P	75	24	41	8/7 ※	Carbide+SUS	※
M12 x 1.25	T04	6P	80	29	48	10/8.5 ※	Carbide+SUS	※
M12 x 1.5	T04	6P	80	29	48	10/8.5 ※	Carbide+SUS	※
M12 x 1.75	T04	6P	80	29	48	10/8.5 ※	Carbide+SUS	※
M14 x 1.5	T04	6P	90	30	48	12/10.5 ※	Carbide+SUS	※
M14 x 2.0	T05	6P	90	30	48	12/10.5 ※	Carbide+SUS	※

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

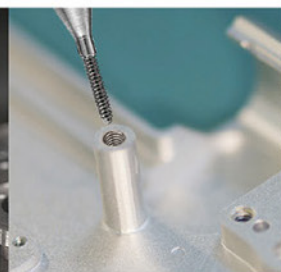
Low Carbon Steels 低碳鋼		Medium Carbon Steels 中碳鋼		High Carbon Steels 高碳鋼	Alloy Steels 合金鋼			Hardened Steels 硬化鋼			Stainless Steels 不銹鋼	Tool Steels 工具鋼	Cast Steels 鑄鋼	Cast Iron 鑄鐵	Ductile Cast Iron 韌性鑄鐵
C~0.25%	C0.25%~0.45%		C~0.45%	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	FC	FC			
○	○	○	○	○	○	○		○		○					
Copper 銅	Brass 黃銅	Brass Casting 黃銅鑄物	Bronze 青銅	Aluminum Rolled 鋁擠壓材質	Aluminum Alloy Casting 鋁合金	Magnesium Alloy Casting 鎂合金	Zinc Alloy Casting 亞鉛合金	Titanium Alloy 鈦合金	Nickel Alloy Ni基合金	Thermo Setting Plastic 熱硬化性塑膠	Thermo Plastic 熱可塑性塑膠				
Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC								
○	○	○		○	○		○							○	

○ Excellent ○ Better

直刃型絲攻 **Straight Fluted Tap**

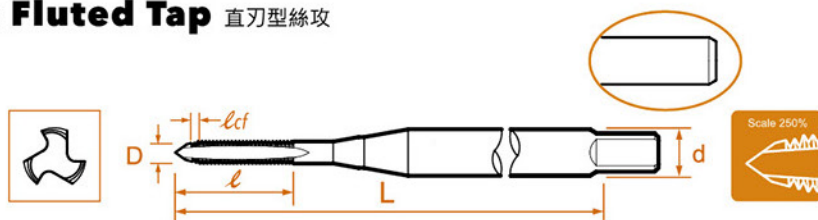
Tap Features 絲攻功能

- For tap is capping of small size tapping operation efficiently in precision components for IT industrial, etc.
 適用精密機器 · IT行業零配件的精密攻牙加工一效率高、精度佳。
- Suitable for Aluminum Alloy Casting, Magnesium Alloy Casting, Copper and Stainless Steel.
 適合鋁合金鑄造 · 鎂合金鑄件 · 銅合金及不銹鋼。



ST series

Straight Fluted Tap 直刃型絲攻



Thread Size 螺紋尺寸	TAP Limit 精度	lc 無效牙	(L) Overall Length 全長	(l) Thread Length 螺紋長	Fluted 刃數	(Ds) Shank Diameter 柄徑	Material 材質	Stock 庫存
M 1 x 0.25	TO1	1.5P	30	5	3	3	Carbide+SUS	○
M 1.1 x 0.25	TO1	1.5P	32	5	3	3	Carbide+SUS	○
M 1.2 x 0.25	TO1	1.5P	32	5	3	3	Carbide+SUS	○
M 1.4 x 0.3	TO1	1.5P	34	8	3	3	Carbide+SUS	✘
M 1.6 x 0.35	TO1	1.5P	36	8	3	3	Carbide+SUS	✘
M 1.7 x 0.35	TO1	1.5P	36	10	3	3	Carbide+SUS	✘
M 1.8 x 0.35	TO1	1.5P	36	10	3	3	Carbide+SUS	○
M 2 x 0.4	TO1	1.5P	40	12	3	3	Carbide+SUS	✘
M 2.2 x 0.45	TO1	1.5P	40	12	3	3	Carbide+SUS	✘
M 2.3 x 0.4	TO1	1.5P	40	12	3	3	Carbide+SUS	✘
M 2.5 x 0.45	TO1	1.5P	45	12	3	3	Carbide+SUS	○
M 2.6 x 0.45	TO1	1.5P	45	12	3	3	Carbide+SUS	✘
M 3 x 0.5	TO1	1.5P	45	12	3	4	Carbide+SUS	✘
M 3.5 x 0.6	TO1	1.5P	50		3	4	Carbide+SUS	✘
M 4 x 0.7	TO2	1.5P	50		3	6/5 ✘	Carbide+SUS	✘
M 4.5 x 0.75	TO2	1.5P	55		3	6/5 ✘	Carbide+SUS	✘
M 5 x 0.8	TO2	1.5P	60		3	6/5.5 ✘	Carbide+SUS	✘
M 6 x 1.0	TO2	1.5P	60		3	6	Carbide+SUS	✘
M 7 x 0.5	TO1	1.5P	65		4	8/6.2 ✘	Carbide+SUS	✘
M 8 x 1.25	TO2	1.5P	70		4	8/6.2 ✘	Carbide+SUS	✘
M 9 x 1.0	TO2	1.5P	72		4	8/7 ✘	Carbide+SUS	✘
M 10 x 1.25	TO2	1.5P	75		4	8/7 ✘	Carbide+SUS	✘
M 11 x 1.5	TO2	1.5P	80		4	8	Carbide+SUS	✘
M 12 x 1.75	TO2	1.5P	82		4	10/8.5 ✘	Carbide+SUS	✘
M 14 x 2.0	TO2	1.5P	88		4	12/10.5 ✘	Carbide+SUS	✘
M 15 x 1.5	TO2	1.5P	95		4	12/10.5 ✘	Carbide+SUS	✘
M 16 x 1.5	TO2	1.5P	95		4	14/12.5 ✘	Carbide+SUS	✘
M 18 x 2.5	TO3	1.5P	100		4	14	Carbide+SUS	✘
M 20 x 2.5	TO3	1.5P	105		4	14/15 ✘	Carbide+SUS	✘

○ Standard 標準品 ✘ Produce by order 訂製品 (Unit 單位: mm)

Low Carbon Steels 低碳鋼	Medium Carbon Steels 中碳鋼	High Carbon Steels 高碳鋼	Alloy Steels 合金鋼	Hardened Steels 硬化鋼			Stainless Steels 不銹鋼	Tool Steels 工具鋼	Cast Steels 鑄鋼	Cast Iron 鑄鐵	Ductile Cast Iron 韌性鑄鐵
C~0.25%	C0.25%~0.45%	C~0.45%	SCM	25~45 HRC	45~55 HRC	50~60 HRC	SUS	SKD	SC	FC	FCD
						○	◎				

◎ Excellent ○ Better



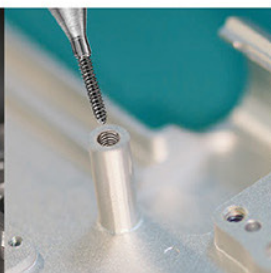
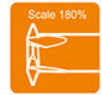
新焊接技術之絲攻及銑牙刀
Taps & Thread Milling Tools for precision operation

TM series

單刃銑牙刀 **Thread Milling**

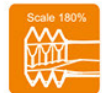
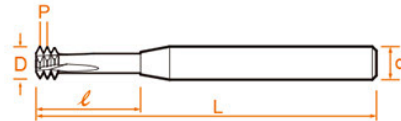
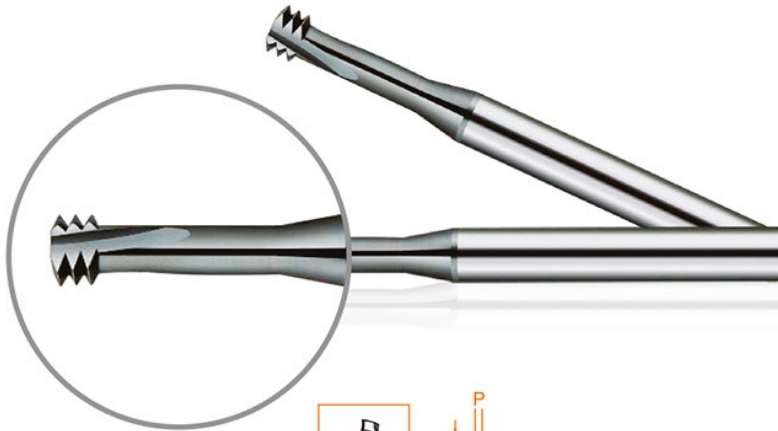
Thread Milling Features 銑牙刀功能

- Thread Size 螺紋尺寸 : M1.0~M8.0
- Reduce resistance of broken. 降低抗折
- Material 材料 : 鎢鋼 (廠牌 : Sumitomo)
- Enhance precision & percentage of thread 提高精度與螺紋的百分比
- Cost down & Increase life expectancy. 降低成本與增加壽命



TM3 series

Thread Milling, 3Flute 三刃銑牙刀



Thread Milling Series 銑牙刀系列						
Thread Size 螺紋尺寸	Pitch (P) 螺距	Diameter (D) 刃徑	Overall Length (L) 全長	Shank Dia. (d) 柄徑	Material 材質	Stock 庫存
M 1 x 0.25	0.25	0.70	50	4	Carbide	○
M 1.2 x 0.25	0.25	0.90	50	4	Carbide	○
M 1.4 x 0.30	0.30	1.05	50	4	Carbide	○
M 1.6 x 0.35	0.35	1.20	50	4	Carbide	○
M 2 x 0.4	0.40	1.55	50	4	Carbide	○
M 2.2 x 0.45	0.45	1.65	50	4	Carbide	○
M 2.5 x 0.45	0.45	1.95	50	4	Carbide	○
M 3 x 0.5	0.50	2.40	50	4	Carbide	○
M 3.5 x 0.6	0.60	2.75	50	4	Carbide	○
M 4 x 0.7	0.70	3.15	50	4	Carbide	○
M 5 x 0.8	0.80	4.05	50	6	Carbide	○
M 6 x 1.0	1.00	4.80	50	6	Carbide	○
M 8 x 1.25	1.25	6.50	50	6	Carbide	○

○ Standard 標準品 ※ Produce by order 訂製品 (Unit 單位: mm)

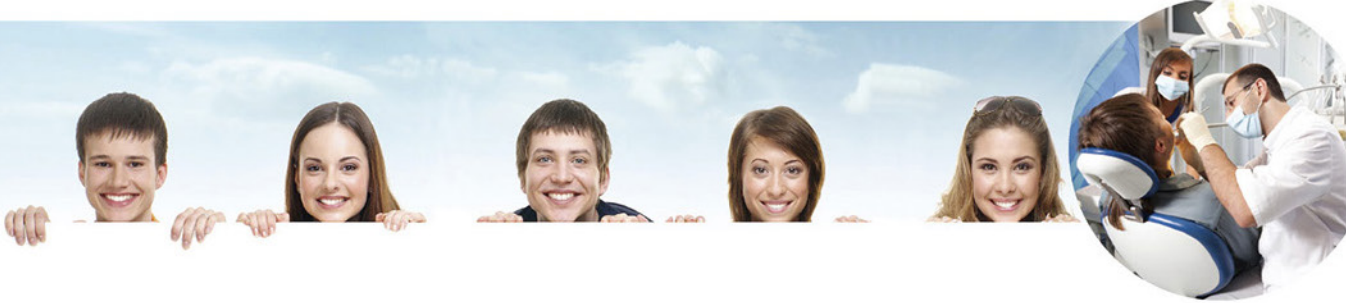
Low Carbon Steels 低碳鋼		Medium Carbon Steels 中碳鋼		High Carbon Steels 高碳鋼		Alloy Steels 合金鋼		Hardened Steels 硬化鋼			Stainless Steels 不銹鋼	Tool Steels 工具鋼	Cast Steels 鑄鋼	Cast Iron 鑄鐵	Ductile Cast Iron 韌性鑄鐵	
C~0.25%		C0.25%~0.45%		C~0.45%		SCM		25~45 HRC	45~55 HRC		50~60 HRC	SUS	SKD	SC	FC	FCD
○	○	○	○	○	○						○					
Copper 銅	Brass 黃銅	Brass Casting 黃銅鑄物	Bronze 青銅	Aluminum Rolled 鋁擠壓材質	Aluminum Alloy Casting 鋁合金	Magnesium Alloy Casting 鎂合金	Zinc Alloy Casting 亞鉛合金	Titanium Alloy 鈦合金	Nickel Alloy Ni基合金	Thermo Setting Plastic 熱硬化性塑膠		Thermo Plastic 熱可塑性塑膠				
Cu	Bs	BsC	PB	AL	AC, ADC	MC	ZDC									
○	○	○		○	○		○									

○ Excellent ○ Better

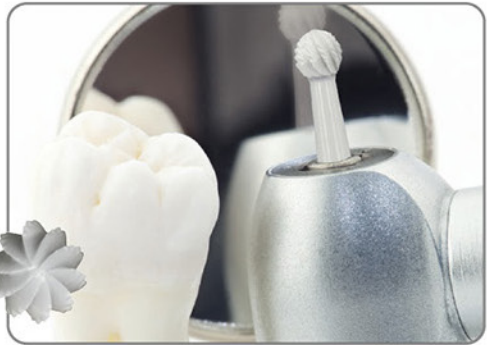
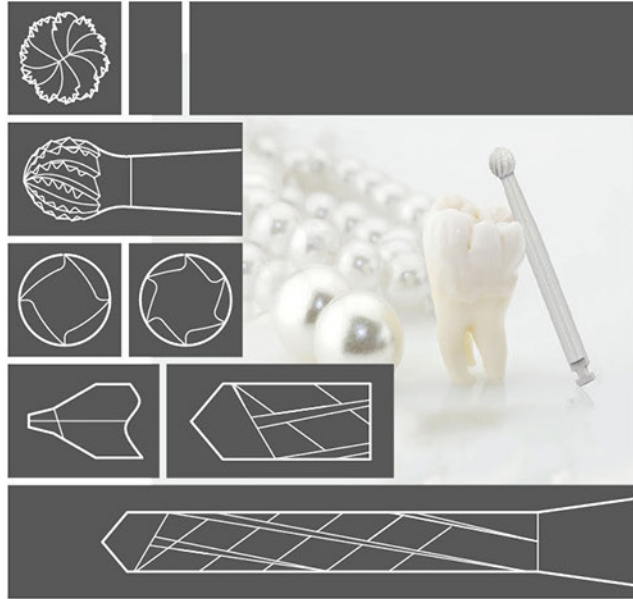


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