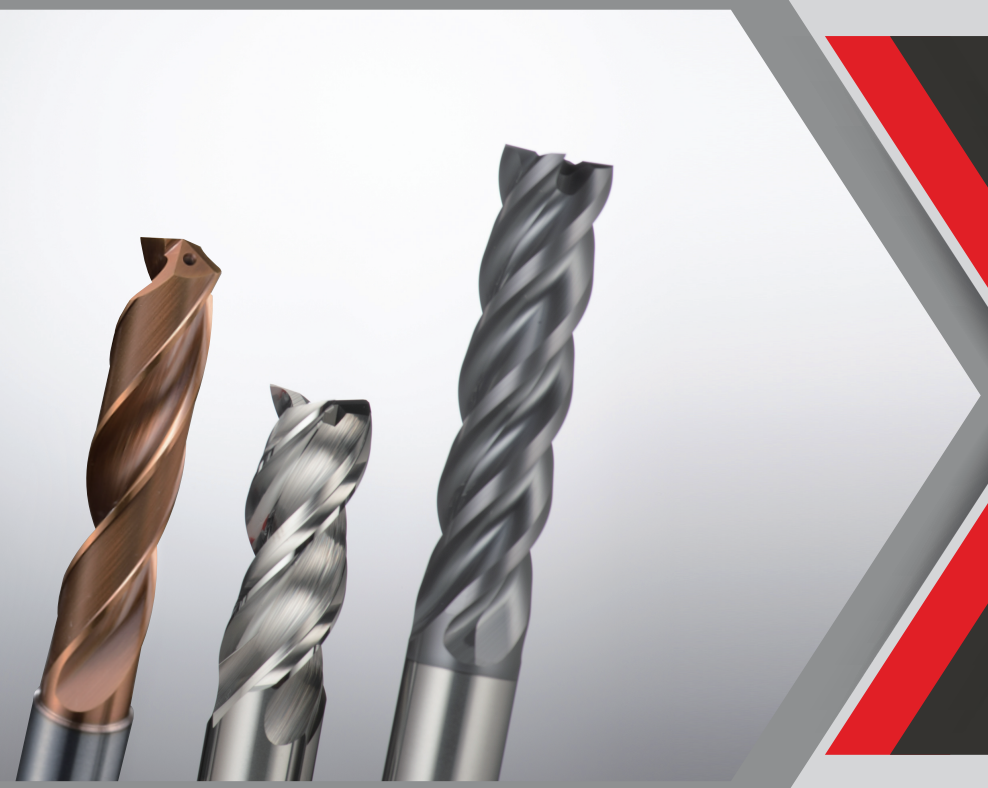
7leaders®
The Art of Cutting



SOLID CARBIDE

End Mills | Drills | Reamers

COMPANY PROFILE 公司簡介

7-Leaders Corp. specializes in production and marketing of tungsten carbide cutting tools such as End mills, Drills, Reamers, and etc.

Established in 1990 by Mr. Jack Lee, the company manufactures high quality products and provides best services along with the trade mark " 7leaders® " all over the world. 7Leaders manufactures solid carbide cutting tools for Mold& Die, Machine Tools, Automotive, Aerospace, 3C, Watches, Optical and Medical solutions.

We keep integrating marketing inall kinds of cutting tools and providing the best quality products to our customers. We aim to become a leading brand name in the cutting tools industry.

七駿科技股份有限公司為董事長李啟樂先生於1990年創立，主要從事銑刀、鑽頭、鉸刀等各種不同碳化鎢鋼切削刀具的生產與銷售。以”7leaders®“行銷全球，提供高品質產品與優越服務。

所研製的刀具，主要應用於模具、機械配件、汽機車、航太、3C、鐘錶眼鏡、運動器材、醫療業。營運範圍遍及兩岸三地以及歐洲、亞洲、中美洲、巴西等國家。

未來七駿將整合式各式樣系列的碳化鎢鋼切削刀具銷售業務，致力滿足客戶對刀具的所有需求，成為超越全球的領導品牌。

24 Hours a Day. 365 Days a Year Automated Production Capabilities

24小時全天、365天全年自動化，最先進生產能力

Tungsten Carbide Rods

01

材料生產

7-Leaders cooperates with a Swiss tungsten carbide rod manufacturer, producing high quality tungsten carbide rods in ETM brand.

七駿與瑞士碳化鎢鋼燒結工廠長期配合，生產ETM品牌碳化鎢鋼圓棒，提供高性能及穩定的材料。

Tools Manufacturing

02

刀具製作

7-Leaders has Walter and Rollomatic CNC grinding machines and manufactures end mills, drills and reamers.

七駿公司擁有最新進的WALTER德國刀具研磨設備及ROLLOMATIC瑞士高階刀具研磨設備。產品系列有立銑刀、鑽頭、鉸刀等全碳化鎢鋼刀具。

Coating Service

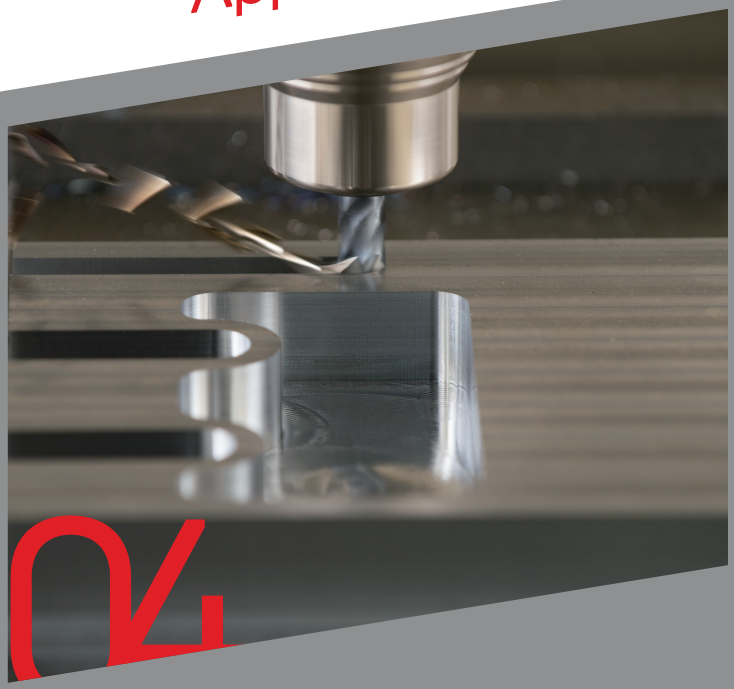
03

塗層服務

Our Nano thin film coating center uses cathodic arc evaporation splitting coating machines from "Swiss-PVD" in Switzerland.
7-Leaders is the first company applying "splitting arc" technology in Taiwan. We provide variable coating service.

七駿奈米塗層部，引進瑞士Swiss-PVD的刀具塗層設備，為台灣首家獲得劈裂式電弧(SplittingArc)奈米塗層技術企業。目前提供各種類塗層服務。

Application



04

應用技術

7-Leaders manufactures cutting tools through strict cutting test and fulfill customers' requirements on application.

七駿所生產的刀具，皆經過嚴密的切削測試，充分滿足客戶對切削應用的所有需求。

NEW OFFER
新產品發售

5 Flutes End Mills
For SUS, SUH

E234SX

Page 127/129 航太刀具

Geometry angles reach ideal balance with flute design.
Five uneven flute distributions which are effective in reducing vibration allow deeper cutting and high speed cutting
It can be widely applied to rough, high speed and finish process on varied metal working material, stainless steel and heat-resistant steel.

幾何角度和刃型達到理想的平衡。
5刃不等分割有效抑制震動的設計允許較大切深和高速加工。
可廣泛使用在粗加工、高速加工和精加工各種金屬材料、不銹鋼及耐熱鋼。

7 Flutes End Mills
For Titanium, Nickel

E236TX

Page 131 航太刀具

Multi flutes design and U-shaped groove are capable of performing well on finish process.
Seven uneven flute distributions are able to decrease vibration.
It is suitable for Titanium and Nickel work material.

多刃設計及U型槽設計可在中加工、精加工應用上實現優異切削性能。
7刃不等分割設計有效抑制震動。
針對鈦合金及鎳加工設計。

POPULAR PRODUCT
人氣商品

End Mills for Aluminium

E143

Page 141 強力鋁用銑刀

Suitable for roughing and finishing process on aluminium.
Better cleanliness on the side and bottom surface of working material.

適用於鋁合金粗加工、中加工及精加工。
加工物的表側面及底面光潔度佳。

Multipurpose End Mills

E140HX
E141HX

Page 93/95/97 多用途立銑刀

Uneven flutes distribution and variable helix design.
Suitable for roughing and finishing process.
A complete range of specifications for flute length:

●1.5D ●2.0D ●2.5D
●3.0D ●4.0D ●5.0D

不等分割及不等螺旋設計。
適用於粗加工、中加工及精加工。

Guide Lines / 簡介表

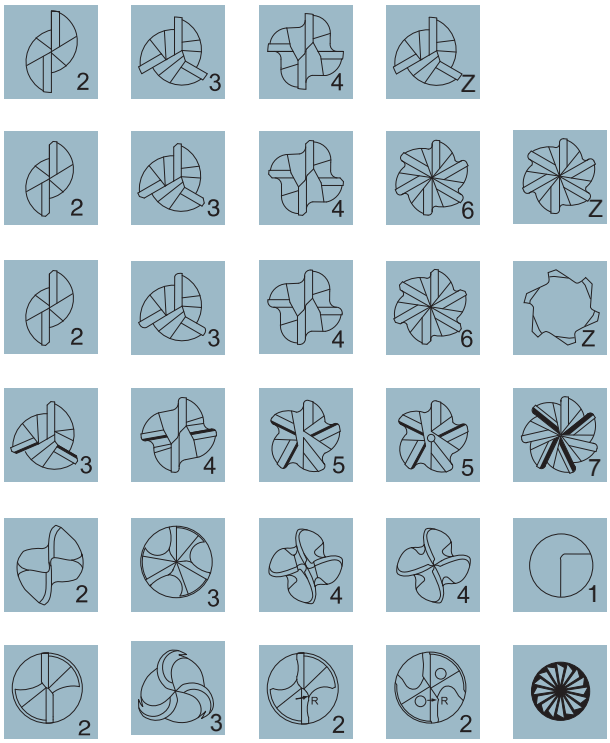
Tool Material / 刀具原料

MG Carbide — Micro Grain 超微粒

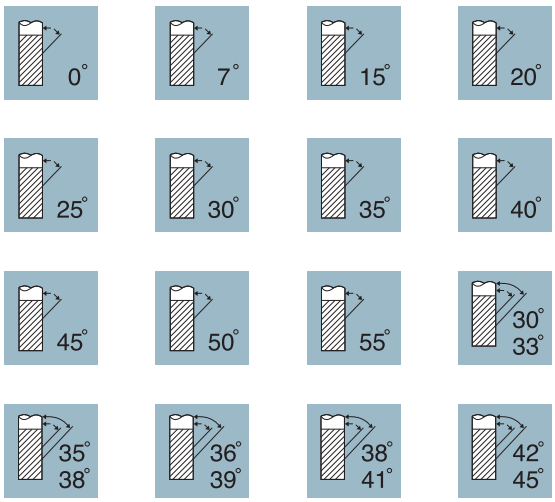
UMG Carbide — Ultra Micro Grain 極超微粒

SMG Carbide — Super Micro Grain 特極超微粒

Number of Flute / 刀具刃數



Helix Angle / 螺旋角



Coating Type / 塗層種類

TiAlN FT

High heat resistance, high oxidation resistance, nanocomposite coating with lubrication property. Suitable for any material and steels < 48HRC.

抗高熱性、高抗氧化性、奈米結構潤滑性佳，適用任何材料及鋼鐵硬度 < 48HRC。

AlTiN X-NaNo

Very high heat resistance and oxidation resistance. Suitable for steels < 60HRC.

非常高抗熱性，非常高抗氧化性，適用鋼鐵硬度 < 60HRC。

AlTiCrN HX

Multilayer, higher hardness, high oxidation resistance. Suitable for steels < 52 HRC.

多層膜，更高的硬度，高抗氧化性、隔熱性，適用鋼鐵硬度 < 52HRC。

AlTiSiN TX

Multilayer, higher nanohardness, extremely high heat resistance, very good thermal insulation. Suitable for high performance machining condition and also for midhardness alloy steels to 70HRC.

多層膜，更高的奈米硬度，非常高抗熱性、隔熱性，適用高效率的加工條件及中高硬度合金鋼材至70HRC。

AlTiN+ZrN SX

The cutting tools that are coater with multilayer nano rainbow film have some advantages as follow: AlTiZrN with extremely high heat and oxidation resistance, as well as good toughness and a smooth surface qualify. These benefits substantially enhance the tool life.

奈米彩虹多層膜，高抗氧化性、隔熱性，大幅提升刀具壽命。

ZrN ZX

Coating features: High surface finish with strong wear resistance, anti-oxidation, low friction, anti-adhesion. Application: Suitable for machining difficult material like aluminum, copper, stainless steels, titanium.。

塗層特性：表面光澤度高，兼具耐磨、抗氧化性能，低摩擦係數，抗沾黏。

應用：適用於加工鋁合金、銅、不鏽鋼、鈦合金等難切削材。

DLC DX

The cutting tools that are coated with multilayer nanorainbow film have some advantages as follow: Abrasion resistance, low-coefficient of friction, Anti-adhesion. These benefits substantially enhance the tool life.

奈米彩虹多層膜，耐摩耗、低摩擦系數、抗沾黏，大幅提升刀具壽命。

Diamond Dc

Extremely high hardness, good chemical stability. Suitable for machining graphite.

極高硬度、化學穩定性，適用石墨加工。

Relief / 傾斜角度

Slant Relief
傾銷

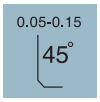
Eccentric Relief
偏心傾斜

Big Eccentric Relief
大偏心傾斜

Corner of Edges / 切削邊緣

Sharp
直角

Ball Nose
圓頭角



Corner Edge 45°
45°直角

Corner Radius
角度半徑

Series Length / 長度系列

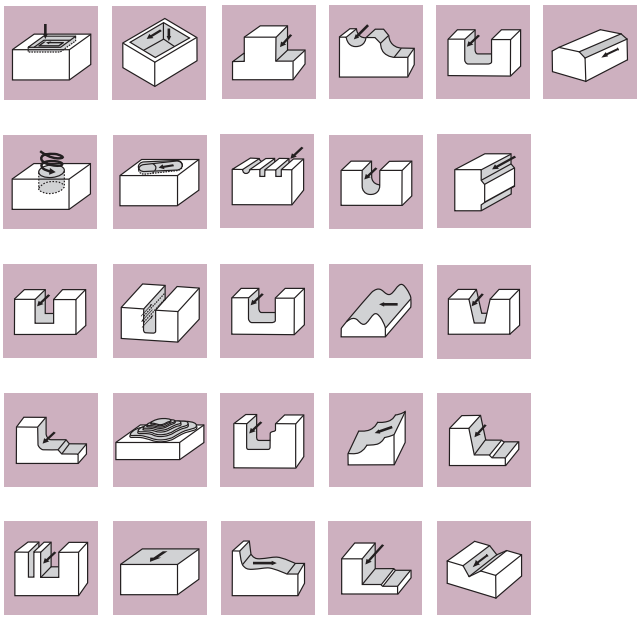
Stub Length / 短系列

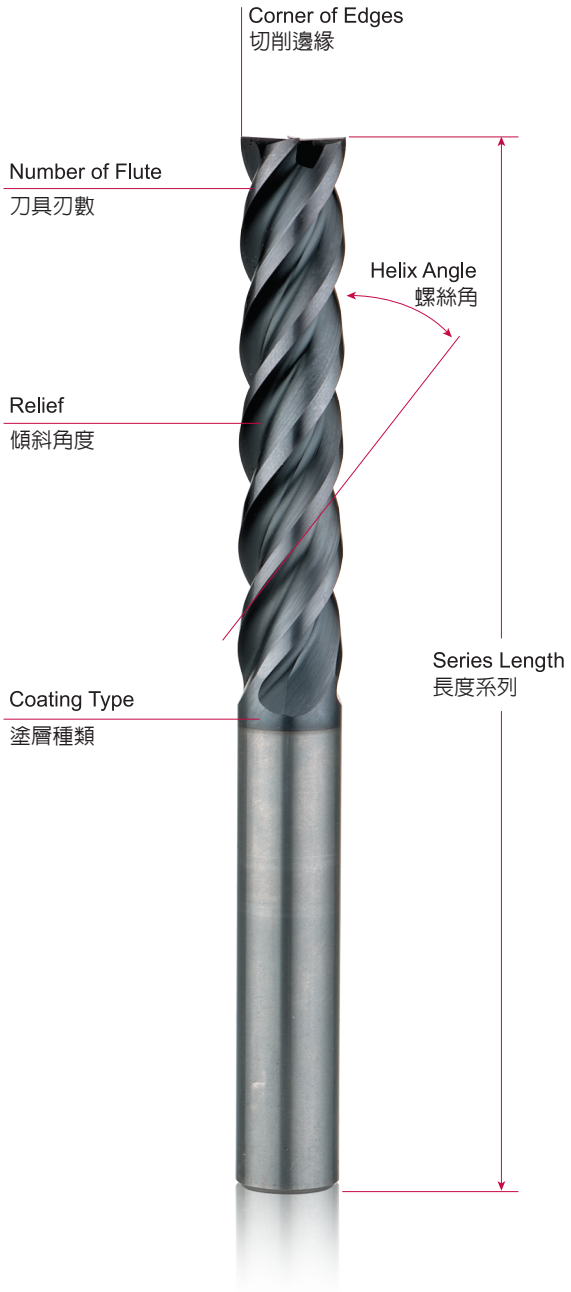
Standard Length / 標準長系列

Long Length / 加長系列

Extra Long Length / 特長系列

Type of Operation / 機械加工方式





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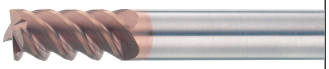
	E164TX E165TX		4	Finishing End Mills	13
	E158TX E159TX		4	High Performance End Mills	15
	E168TX E169TX		4	High Performance End Mills	17
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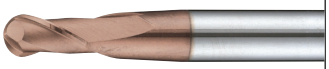
	B250TX		2	Ball Nose End Mills	37
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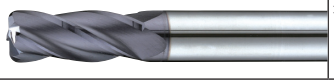
	B258X		不等 4	End Mills With Corner Radius	47

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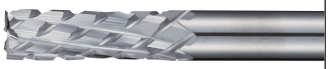
Routers For Composite Materials	E190 E191			Routers For Composite Materials	153
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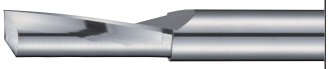
	E291		1	Routers For Composite Materials	159
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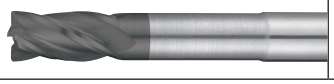
	G298DC		4	End Mills For Graphite	171

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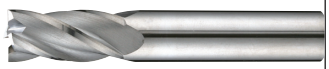
	E174		4	Finishing End Mills	203
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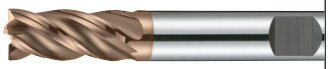
	F604TX F606TX		4	Finishing End Mills	237
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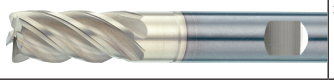
	F653SX		不等 5	Multipurpose End Mills With Corner Radius	267

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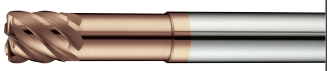
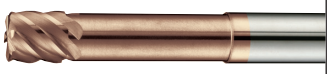
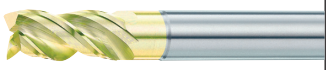
	F613TX		6	Toric End Mills	271
	F614TX		6	Toric End Mills	271
End Mills For Aluminium - DIN	F631ZX		不等 3	End Mills For Aluminium	275
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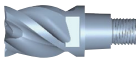
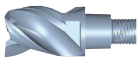
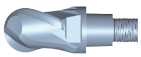
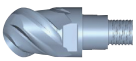
End Mills	EMH/SM		不等 4	Multipurpose End Mills	332
	EMH/SA		不等 3	End Mills For Aluminum	332
	EMH/BE		2	Ball Nose End Mills	332
	EMH/BH		4	Ball Nose End Mills - 4 Flutes	332

通用 精加工立銑刀
Universal Finishing End mills

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Apperance						
Code No	E122X	E125X E127X	E162TX E163TX	E124X	E126X E128X	E164TX E165TX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX
Helix Angle	35°	35°	35°	35°	35°	35°
No.of Flutes	2	2	2	4	4	4

7leaders®
The Art of Cutting

15	17	19
		
E158TX E159TX	**E168TX E169TX**	**E166TX E167TX**
SMG Carbide	**SMG Carbide**	**SMG Carbide**
AlTiSiN TX	**AlTiSiN TX**	**AlTiSiN TX**
 45°	 55°	 45°
 4	 4	 6

E122X 超微粒鎢鋼塗層通用立銑刀

Universal End Mills

Code No. E122X-Dc

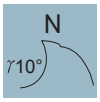
Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E122X	Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E122X	Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E122X
0.1	0.3	50	4	●	6.9	20	60	8	●	13.9	26	80	12	●
0.2	0.5	50	4	●	7	20	60	8	●	14	32	90	16	●
0.3	0.8	50	4	●	7.1	20	60	8	●	14.1	32	90	16	●
0.4	1	50	4	●	7.2	20	60	8	●	14.2	32	90	16	●
0.5	1.2	50	4	●	7.3	20	60	8	●	14.3	32	90	16	●
0.6	1.5	50	4	●	7.4	20	60	8	●	14.4	32	90	16	●
0.7	1.8	50	4	●	7.5	20	60	8	●	14.5	32	90	16	●
0.8	2	50	4	●	7.6	20	60	8	●	14.6	32	90	16	●
0.9	2.5	50	4	●	7.7	20	60	8	●	14.7	32	90	16	●
1	3	50	4	●	7.8	20	60	8	●	14.8	32	90	16	●
1.1	3	50	4	●	7.9	20	60	8	●	14.9	32	90	16	●
1.2	4	50	4	●	8	20	60	8	●	15	32	90	16	●
1.3	4	50	4	●	8.1	20	72	10	●	15.1	38	100	16	●
1.4	4	50	4	●	8.2	20	72	10	●	15.2	38	100	16	●
1.5	5	50	4	●	8.3	20	72	10	●	15.3	38	100	16	●
1.6	5	50	4	●	8.4	20	72	10	●	15.4	38	100	16	●
1.7	5	50	4	●	8.5	20	72	10	●	15.5	38	100	16	●
1.8	5	50	4	●	8.6	22	72	10	●	15.6	38	100	16	●
1.9	5	50	4	●	8.7	22	72	10	●	15.7	38	100	16	●
2	6	50	4	●	8.8	22	72	10	●	15.8	38	100	16	●
2.1	6	50	4	●	8.9	22	72	10	●	15.9	38	100	16	●
2.2	6	50	4	●	9	22	72	10	●	16	38	100	16	●
2.3	6	50	4	●	9.1	22	72	10	●	16.1	38	100	20	●
2.4	8	50	4	●	9.2	22	72	10	●	16.2	38	100	20	●
2.5	8	50	4	●	9.3	22	72	10	●	16.3	38	100	20	●
2.6	8	50	4	●	9.4	22	72	10	●	16.4	38	100	20	●
2.7	8	50	4	●	9.5	22	72	10	●	16.5	38	100	20	●
2.8	8	50	4	●	9.6	22	72	10	●	16.6	38	100	20	●
2.9	8	50	4	●	9.7	22	72	10	●	16.7	38	100	20	●
3 A	8	50	4	●	9.8	22	72	10	●	16.8	38	100	20	●
4 A	11	50	4	●	9.9	22	72	10	●	16.9	38	100	20	●
3	8	50	6	●	10	22	72	10	●	17	38	100	20	●
3.1	10	50	6	●	10.1	22	75	12	●	17.1	38	100	20	●
3.2	10	50	6	●	10.2	22	75	12	●	17.2	38	100	20	●
3.3	10	50	6	●	10.3	22	75	12	●	17.3	38	100	20	●
3.4	10	50	6	●	10.4	22	75	12	●	17.4	38	100	20	●
3.5	10	50	6	●	10.5	22	75	12	●	17.5	38	100	20	●
3.6	10	50	6	●	10.6	26	75	12	●	17.6	38	100	20	●
3.7	10	50	6	●	10.7	26	75	12	●	17.7	38	100	20	●
3.8	11	50	6	●	10.8	26	75	12	●	17.8	38	100	20	●
3.9	11	50	6	●	10.9	26	75	12	●	17.9	38	100	20	●
4	11	50	6	●	11	26	75	12	●	18	38	100	20	●
4.1	11	50	6	●	11.1	26	75	12	●	18.1	38	100	20	●
4.2	11	50	6	●	11.2	26	75	12	●	18.2	38	100	20	●
4.3	11	50	6	●	11.3	26	75	12	●	18.3	38	100	20	●
4.4	11	50	6	●	11.4	26	75	12	●	18.4	38	100	20	●
4.5	11	50	6	●	11.5	26	75	12	●	18.5	38	100	20	●
4.6	11	50	6	●	11.6	26	75	12	●	18.6	38	100	20	●
4.7	11	50	6	●	11.7	26	75	12	●	18.7	38	100	20	●
4.8	13	50	6	●	11.8	26	75	12	●	18.8	38	100	20	●
4.9	13	50	6	●	11.9	26	75	12	●	18.9	38	100	20	●
5	13	50	6	●	12	26	75	12	●	19	38	100	20	●
5.1	13	50	6	●	12.1	26	80	12	●	19.1	38	100	20	●
5.2	13	50	6	●	12.2	26	80	12	●	19.2	38	100	20	●
5.3	13	50	6	●	12.3	26	80	12	●	19.3	38	100	20	●
5.4	13	50	6	●	12.4	26	80	12	●	19.4	38	100	20	●
5.5	13	50	6	●	12.5	26	80	12	●	19.5	38	100	20	●
5.6	16	50	6	●	12.6	26	80	12	●	19.6	38	100	20	●
5.7	16	50	6	●	12.7	26	80	12	●	19.7	38	100	20	●
5.8	16	50	6	●	12.8	26	80	12	●	19.8	38	100	20	●
5.9	16	50	6	●	12.9	26	80	12	●	19.9	38	100	20	●
6	16	50	6	●	13	26	80	12	●	20	38	100	20	●
6.1	16	60	8	●	13.1	26	80	12	●	1/8 3.175	8	50	6	●
6.2	16	60	8	●	13.2	26	80	12	●	3/16 4.760	12	50	6	●
6.3	16	60	8	●	13.3	26	80	12	●	1/4 6.350	18	60	8	●
6.4	16	60	8	●	13.4	26	80	12	●	5/16 7.940	20	60	8	●
6.5	16	60	8	●	13.5	26	80	12	●	3/8 9.525	22	72	10	●
6.6	20	60	8	●	13.6	26	80	12	●	1/2 12.700	26	75	12	●
6.7	20	60	8	●	13.7	26	80	12	●	5/8 15.880	38	100	16	●
6.8	20	60	8	●	13.8	26	80	12	●	3/4 19.050	38	100	20	●

Steel < 48HRC

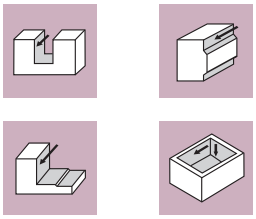
P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiN X-NaNo



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E122X 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

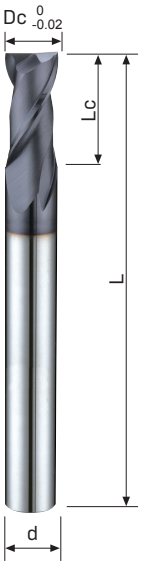
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel ※切削液使用		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 20~40 Ø0.8~3.0 40~50 Ø3.1~20 55~60		Ø0.1~0.7 20~35 Ø0.8~3.0 35~45 Ø3.1~20 45~50		Ø0.1~0.7 20~40 Ø0.8~3.0 40~50 Ø3.1~20 55~60		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 80~100		Ø0.1~0.7 30~95 Ø0.8~20 125~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E122X-0.1	0.1	35,000	60	35,000	60	35,000	60	35,000	50	35,000	20	35,000	50	35,000	60	50,000	100
E122X-0.2	0.2	32,000	85	32,000	85	32,000	80	32,000	75	32,000	30	32,000	75	32,000	85	50,000	140
E122X-0.3	0.3	32,000	100	32,000	100	32,000	90	32,000	80	32,000	55	32,000	80	32,000	100	50,000	170
E122X-0.4	0.4	32,000	110	32,000	110	32,000	100	32,000	90	27,500	60	32,000	90	32,000	110	50,000	190
E122X-0.5	0.5	31,000	115	31,000	115	31,000	150	25,000	90	22,000	60	25,000	90	31,000	115	50,000	200
E122X-0.6	0.6	27,000	118	27,000	118	27,000	105	19,500	90	17,000	60	19,500	90	27,000	118	50,000	230
E122X-0.8	0.8	21,500	120	21,500	120	21,500	108	15,500	90	13,500	60	15,500	90	21,500	120	50,000	290
E122X-1	1	17,500	120	17,500	120	17,500	108	12,500	90	11,000	60	12,500	90	17,500	120	47,500	300
E122X-1.2	1.2	15,000	118	15,000	118	15,000	106	10,500	90	9,300	60	10,500	90	15,000	118	40,500	300
E122X-1.5	1.5	12,500	122	12,500	122	12,500	110	8,900	90	7,900	60	8,900	90	12,500	122	32,000	300
E122X-1.8	1.8	10,500	125	10,500	125	10,500	115	7,500	90	6,800	60	7,500	90	10,500	125	28,000	300
E122X-2	2	9,700	130	9,700	130	9,700	117	7,000	90	6,300	70	7,000	90	9,700	130	24,000	300
E122X-2.5	2.5	8,200	155	8,200	155	8,200	140	6,100	90	5,300	70	6,100	90	8,200	155	20,000	350
E122X-3	3	6,900	170	6,900	170	6,900	153	5,300	100	4,400	70	5,300	100	8,493	200	16,000	400
E122X-3.5	3.5	6,000	190	6,000	190	6,000	190	4,700	100	3,860	70	4,700	100	7,280	210	13,650	415
E122X-4	4	5,400	210	5,400	210	5,400	190	4,200	120	3,500	90	4,200	120	6,370	215	12,000	430
E122X-4.5	4.5	4,850	240	4,850	240	4,850	240	3,800	120	3,200	90	3,800	120	5,660	220	10,600	465
E122X-5	5	4,500	265	4,500	265	4,500	240	3,500	130	3,000	95	3,500	130	5,096	225	9,500	500
E122X-5.5	5.5	4,200	268	4,200	268	4,200	268	3,200	130	2,720	95	3,200	130	4,630	225	8,700	510
E122X-6	6	4,000	270	4,000	270	4,000	243	2,900	130	2,500	100	2,900	130	4,247	230	7,900	520
E122X-7	7	3,500	265	3,500	265	3,500	265	2,550	120	2,200	100	2,550	120	3,640	235	6,900	520
E122X-8	8	3,000	265	3,000	265	3,000	265	2,200	120	1,900	100	2,200	120	3,185	235	5,900	520
E122X-9	9	2,700	260	2,700	260	2,700	260	1,950	120	1,650	95	1,950	120	2,830	215	5,300	500
E122X-10	10	2,400	255	2,400	255	2,400	255	1,700	120	1,400	95	1,700	120	2,548	215	4,700	500
E122X-11	11	2,200	250	2,200	250	2,200	250	1,550	120	1,300	95	1,550	120	2,310	215	4,350	500
E122X-12	12	2,000	246	2,000	246	2,000	246	1,400	120	1,200	95	1,400	120	2,123	215	4,000	500
E122X-13	13	1,850	240	1,850	240	1,850	240	1,300	90	1,100	80	1,300	90	1,960	210	3,750	400
E122X-14	14	1,700	240	1,700	240	1,700	240	1,200	90	1,000	80	1,200	90	1,820	210	3,500	400
E122X-15	15	1,600	220	1,600	220	1,600	220	1,050	90	900	80	1,050	90	1,700	210	3,250	400
E122X-16	16	1,500	200	1,500	200	1,500	200	1,100	90	800	80	1,100	90	1,593	210	3,000	400
E122X-17	17	1,400	190	1,400	190	1,400	190	1,000	90	750	70	1,000	90	1,500	205	2,850	350
E122X-18	18	1,300	180	1,300	180	1,300	180	900	90	700	70	900	90	1,416	205	2,700	350
E122X-19	19	1,100	165	1,100	165	1,100	165	850	90	650	60	850	90	1,340	205	2,550	300
E122X-20	20	1,200	155	1,200	155	1,200	155	800	90	600	60	800	90	1,274	205	2,400	300
切入深度 (mm) 		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.01D <3 0.02D ≥3 0.05D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E125X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E125X
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
11	35	110	12	●
12	40	110	12	●
14	40	120	16	●
16	50	140	16	●
20	60	160	20	●

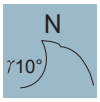


Steel < 48HRC

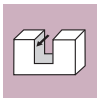
P	H	M	K	N	S
●	●	○	●	○	

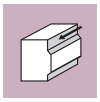
MG Carbide

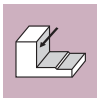
AlTiN X-NaNo

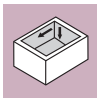


Type of Operation



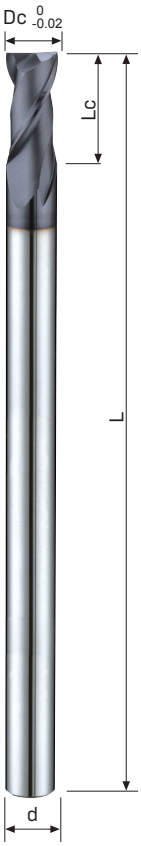






Code No. E127X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E127X
3	12	80	4	●
4	15	80	4	●
5	20	100	6	●
6	20	100	6	●
8	25	130	8	●
10	30	160	10	●
12	40	180	12	●
16	50	210	16	●
20	60	210	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E125X / E127X 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60		60		50		40		30		80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E125X/E127X-3	3	6,050	140	6,050	140	5,200	120	4,200	80	3,000	65	6,800	140
E125X/E127X-4	4	4,860	149	4,860	149	3,800	120	3,200	90	2,160	65	4,860	149
E125X/E127X-5	5	4,050	162	4,050	162	3,050	120	2,600	90	1,800	75	4,050	162
E125X/E127X-6	6	3,250	162	3,250	162	2,600	120	2,100	90	1,440	75	3,250	162
E125X-7	7	2,850	162	2,850	162	2,275	130	1,850	100	1,260	75	2,850	162
E125X/E127X-8	8	2,450	162	2,450	162	1,950	140	1,600	100	1,080	75	2,450	162
E125X-9	9	2,200	162	2,200	162	1,750	140	1,450	110	970	75	2,200	162
E125X/E127X-10	10	1,950	162	1,950	162	1,550	140	1,300	110	870	75	1,950	162
E125X-11	11	1,780	162	1,780	162	1,420	140	1,200	110	790	75	1,780	162
E125X/E127X-12	12	1,620	162	1,620	162	1,300	140	1,080	110	720	75	1,620	162
E125X-14	14	1,650	180	1,650	180	1,200	150	1,000	118	720	80	1,650	180
E125X/E127X-16	16	1,400	198	1,400	198	1,900	160	900	125	630	90	1,400	198
E125X/E127X-20	20	1,080	198	1,080	198	870	160	720	125	480	90	1,080	198
切入深度 (mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.2D		ap:0.2D		ap:0.3D	

※ Notice: E127X is Long Length series End Mills. Please adjust the parameter according

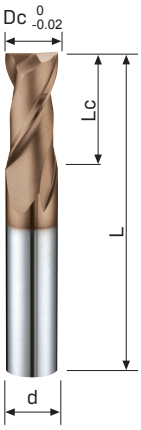
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E127X為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E162TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E162TX
0.1	0.3	50	4	●
0.2	0.5	50	4	●
0.3	0.8	50	4	●
0.4	1	50	4	●
0.5	1.2	50	4	●
0.6	1.5	50	4	●
0.8	2	50	4	●
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3 A	8	50	4	●
4 A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●

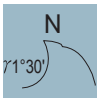


Steel < 56HRC

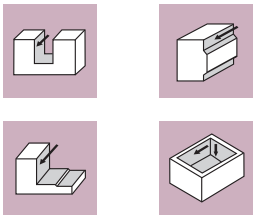
P	H	M	K	N	S
●	●				

UMG Carbide

AlTiSiN TX



Type of Operation

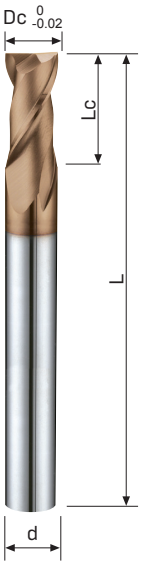


Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E163TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E163TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
11	35	110	12	●
12	40	110	12	●
14	40	120	16	●
16	50	140	16	●
20	60	160	20	●



E162TX / E163TX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		Ø0.1~0.7 28~57 Ø0.8~3.0 60~100 Ø3.1~20 109~120		Ø0.1~0.7 28~57 Ø0.8~3.0 60~100 Ø3.1~20 109~120		Ø0.1~0.7 20~50 Ø0.8~3.0 55~65 Ø3.1~20 65~80		Ø0.1~0.7 28~45 Ø0.8~3.0 48~80 Ø3.1~20 88~110		Ø0.1~0.7 28~34 Ø0.8~3.0 35~59 Ø3.1~20 65~70		Ø0.1~20 21~45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E162TX-0.1	0.1	30,000	100	30,000	100	30,000	100	30,000	100	30,000	50	30,000	25
E162TX-0.2	0.2	30,000	100	30,000	100	30,000	100	30,000	100	30,000	50	30,000	25
E162TX-0.3	0.3	30,000	110	30,000	110	30,000	110	30,000	110	30,000	55	22,000	25
E162TX-0.4	0.4	30,000	120	30,000	120	30,000	120	30,000	120	27,000	60	17,000	25
E162TX-0.5	0.5	30,000	120	30,000	120	29,000	120	29,000	120	21,500	60	13,000	25
E162TX-0.6	0.6	30,000	120	30,000	120	24,000	120	24,000	120	18,000	60	11,000	25
E162TX-0.8	0.8	24,000	120	24,000	120	19,000	120	19,000	120	13,800	60	8,800	30
E162TX-1	1	28,500	500	28,500	500	28,500	500	25,000	380	19,000	250	12,500	110
E162TX-1.5	1.5	22,000	505	22,000	505	22,000	505	19,250	390	14,500	255	9,650	115
E162TX-2	2	15,500	510	15,500	510	15,500	510	13,500	400	10,000	260	6,800	120
E162TX-2.5	2.5	13,000	530	13,000	530	13,000	530	11,000	405	8,150	270	5,800	130
E162TX/E163TX-3	3	10,500	550	10,500	550	10,500	550	8,500	410	6,300	280	4,800	140
E162TX-3.5	3.5	9,600	555	9,600	555	9,600	555	7,750	405	5,750	275	4,300	135
E162TX/E163TX-4	4	8,700	560	8,700	560	8,700	560	7,000	400	5,200	270	3,800	135
E162TX-4.5	4.5	7,700	550	7,700	550	7,700	550	6,500	450	4,800	260	3,500	130
E162TX/E163TX-5	5	7,500	545	7,500	545	7,500	545	6,150	475	4,450	250	3,225	125
E162TX-5.5	5.5	6,800	540	6,800	540	6,800	540	5,800	500	4,000	240	3,000	120
E162TX/E163TX-6	6	6,300	530	6,300	530	6,300	530	5,300	550	3,700	235	2,650	120
E162TX/E163TX-7	7	5,550	530	5,550	530	5,550	530	4,650	460	3,250	240	2,300	135
E162TX/E163TX-8	8	4,800	530	4,800	530	4,800	530	4,000	370	2,800	250	2,000	130
E162TX/E163TX-9	9	4,300	540	4,300	540	4,300	540	3,600	375	2,550	250	1,800	140
E162TX/E163TX-10	10	3,800	550	3,800	550	3,800	550	3,200	380	2,300	250	1,600	150
E162TX/E163TX-11	11	3,500	540	3,500	540	3,500	540	2,900	380	2,120	255	1,500	150
E162TX/E163TX-12	12	3,200	530	3,200	530	3,200	530	2,600	380	1,950	260	1,400	155
E162TX/E163TX-14	14	2,750	510	2,750	510	2,750	510	2,500	360	1,600	250	1,000	135
E162TX/E163TX-16	16	2,400	500	2,400	500	2,400	500	2,200	350	1,400	240	900	120
E162TX-18	18	2,200	480	2,200	480	2,200	480	1,950	320	1,200	220	800	110
E162TX/E163TX-20	20	1,900	460	1,900	460	1,900	460	1,750	300	1,100	200	720	110
切入深度 (mm) 		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.1D ≥3 0.2D		ap:<3 0.05D ≥3 0.1D		ap:<3 0.05D ≥3 0.1D	

※ Notice: E163TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E163TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

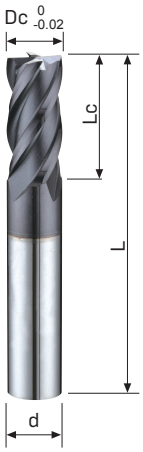
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E124X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E124X
1	3	50	4	●
1.2	4	50	4	●
1.4	4	50	4	●
1.5	5	50	4	●
1.6	5	50	4	●
1.8	5	50	4	●
2	6	50	4	●
2.2	6	50	4	●
2.4	8	50	4	●
2.5	8	50	4	●
2.6	8	50	4	●
2.8	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
6.5	16	60	8	●
7	20	60	8	●
7.5	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	22	72	10	●
9.5	22	72	10	●
10	22	72	10	●
10.5	22	75	12	●
11	26	75	12	●
12	26	75	12	●
13	26	80	12	●
14	32	90	16	●
15	32	90	16	●
16	38	100	16	●
17	38	100	20	●
18	38	100	20	●
19	38	100	20	●
20	38	100	20	●

Code No. E124X-Dc

Dc 0 -0.02		Lc mm	L mm	d h6	AlTiN E124X
1/8	3.175	8	50	6	●
3/16	4.760	12	50	6	●
1/4	6.350	18	60	8	●
5/16	7.940	20	60	8	●
3/8	9.525	22	72	10	●
1/2	12.700	26	75	12	●
5/8	15.880	38	100	16	●
3/4	19.050	38	100	20	●

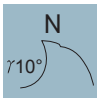


Steel < 48HRC

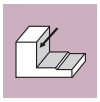
P	H	M	K	N	S
●	●	○	●	○	

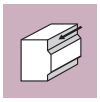
MG Carbide

AlTiN X-NaNo



Type of Operation





Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E124X 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

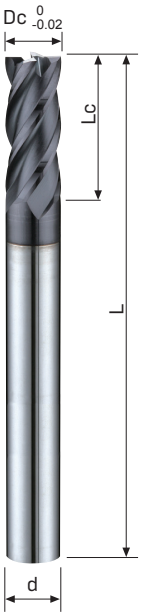
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		85		85		75		60		50		60		85		150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E124X-1	1	20,000	240	20,000	240	15,000	210	11,000	85	7,100	40	11,000	85	20,000	240	47,600	420
E124X-1.5	1.5	13,500	250	13,500	250	12,500	215	8,000	90	6,900	80	8,000	90	13,500	250	31,800	620
E124X-2	2	13,000	300	13,000	300	11,000	280	7,000	110	6,350	100	7,000	110	13,000	300	24,000	590
E124X-2.5	2.5	11,000	370	11,000	370	9,500	245	6,300	110	5,500	105	6,300	110	11,000	370	19,200	960
E124X-3	3	9,000	480	9,000	480	7,400	350	5,300	120	4,800	110	5,300	120	9,000	480	15,800	860
E124X-3.5	3.5	7,800	490	7,800	490	6,500	350	4,800	130	4,300	110	4,800	130	7,800	490	13,600	860
E124X-4	4	6,650	500	6,650	500	5,500	350	4,250	135	3,700	115	4,250	135	6,650	500	12,000	900
E124X-4.5	4.5	6,000	550	6,000	550	5,000	385	3,870	130	3,450	120	3,870	130	5,950		10,700	970
E124X-5	5	5,300	600	5,300	600	4,500	420	3,500	130	3,200	120	3,500	130	5,300	600	9,400	1,040
E124X-5.5	5.5	4,900	600	4,900	600	4,100	420	3,250	135	2,920	125	3,250	135	4,900		8,600	1,040
E124X-6	6	4,500	600	4,500	600	3,700	425	3,000	140	2,650	125	3,000	140	4,500	600	7,800	1,040
E124X-7	7	3,900	575	3,900	575	2,950	410	2,420	130	2,250	125	2,420	130	3,900		6,800	1,025
E124X-8	8	3,300	550	3,300	550	2,600	410	1,850	120	1,900	125	1,850	120	3,300	550	5,800	1,010
E124X-9	9	2,950	535	2,950	535	2,350	405	1,650	125	1,700	130	1,650	125	2,950		5,300	1,010
E124X-10	10	2,600	520	2,600	520	2,100	400	1,500	125	1,500	130	1,500	125	2,600	520	4,800	1,010
E124X-11	11	2,400	520	2,400	520	1,950	405	1,350	125	1,350	120	1,350	120	2,400		4,400	1,010
E124X-12	12	2,200	520	2,200	520	1,800	405	1,200	120	1,200	120	1,200	120	2,200	520	4,000	1,010
E124X-13	13	2,050	535	2,050	535	1,700	410	1,200	130	1,150	120	1,200	130	2,050		3,700	1,000
E124X-14	14	1,900	550	1,900	550	1,600	410	1,200	140	1,100	120	1,200	140	1,900	550	3,400	990
E124X-15	15	1,800	540	1,800	540	1,500	410	1,150	130	1,050	100	1,050	135	1,800		3,200	975
E124X-16	16	1,700	530	1,700	530	1,400	410	1,100	130	1,000	100	1,100	130	1,700	530	3,000	960
E124X-17	17	1,600	525	1,600	525	1,300	405	1,020	100	940	95	1,020	115	1,600		2,800	950
E124X-18	18	1,500	520	1,500	520	1,200	405	950	100	880	95	950	100	1,500	520	2,600	940
E124X-19	19	1,400	510	1,400	510	1,150	385	925	90	840	90	925	95	1,400		2,500	910
E124X-20	20	1,300	500	1,300	500	1,100	370	900	90	800	90	900	90	1,300	500	2,400	890
切入深度 (mm) 		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.01D ≥3 0.02D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E126X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E126X
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
11	35	110	12	●
12	40	110	12	●
14	40	120	16	●
16	50	140	16	●
20	60	160	20	●

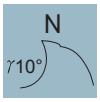


Steel < 48HRC

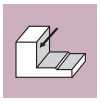
P	H	M	K	N	S
●	●	○	●	○	

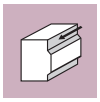
MG Carbide

AlTiN X-NaNo



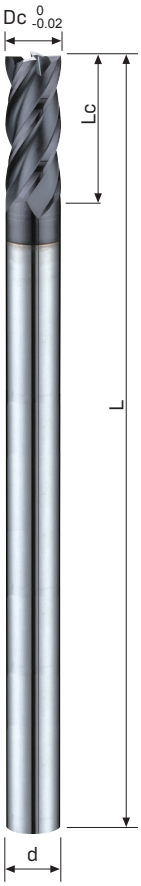
Type of Operation





Code No. E128X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E128X
3	12	80	4	●
4	15	80	4	●
5	20	100	6	●
6	20	100	6	●
8	25	130	8	●
10	30	160	10	●
12	40	180	12	●
16	50	210	16	●
20	60	210	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E126X / E128X 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		65		65		55		40		38		40		65		115	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E126X/E128X-3	3	6,750	360	6,750	360	5,550	265	3,975	90	3,600	85	3,975	90	6,750	360	11,850	645
E126X/E128X-4	4	5,000	375	5,000	375	4,125	265	3,200	100	2,775	85	3,200	100	5,000	375	9,000	675
E126X/E128X-5	5	3,975	450	3,975	450	3,375	315	2,625	100	2,400	90	2,625	100	3,975	450	7,050	780
E126X/E128X-6	6	3,375	450	3,375	450	2,775	320	2,250	105	1,988	95	2,250	105	3,375	450	5,850	780
E126X-7	7	2,900	430	2,900	430	2,360	315	1,800	100	1,700	95	1,820	100	2,900	430	5,000	770
E126X/E128X-8	8	2,475	410	2,475	410	1,950	310	1,400	90	1,425	95	1,400	90	2,475	410	4,350	760
E126X-9	9	2,200	400	2,200	400	1,775	305	1,270	95	1,270	100	1,250	95	2,200	400	3,950	760
E126X/E128X-10	10	1,950	390	1,950	390	1,575	300	1,125	95	1,125	100	1,125	95	1,950	390	3,600	760
E126X-11	11	1,800	390	1,800	390	1,450	305	1,000	90	1,000	95	1,000	90	1,800	390	3,300	760
E126X/E128X-12	12	1,650	390	1,650	390	1,350	305	900	90	900	90	900	90	1,650	390	3,000	760
E126X-14	14	1,430	413	1,430	413	1,200	310	900	105	825	90	900	105	1,430	413	2,550	750
E126X/E128X-16	16	1,275	400	1,275	400	1,050	310	825	100	750	75	825	100	1,275	400	2,250	720
E126X/E128X-20	20	975	375	975	375	825	275	675	70	600	70	675	70	975	375	1,800	670
切入深度 (mm) 		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

※ Notice: E128X is Long Length series End Mills. Please adjust the parameter according

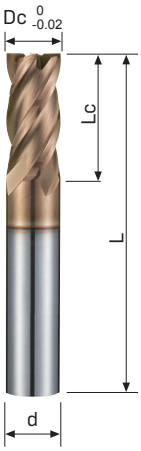
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E128X為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E164TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E164TX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3 A	8	50	4	●
4 A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●

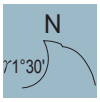


Steel < 56HRC

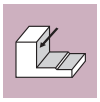
P	H	M	K	N	S
●	●				

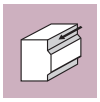
UMG Carbide

AlTiSiN TX



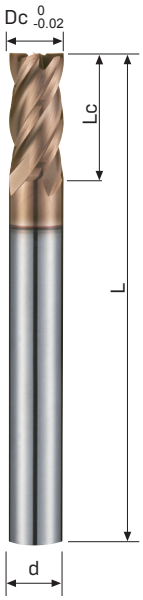
Type of Operation





Code No. E165TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E165TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
7	25	100	8	●
8	25	100	8	●
9	30	100	10	●
10	30	100	10	●
11	35	110	12	●
12	40	110	12	●
14	40	120	16	●
16	50	140	16	●
20	60	160	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E164TX / E165TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.5 63~70 Ø3.0~20 108~122		Ø1.0~2.0 63~67 Ø3.0~20 69~72		Ø1.0~2.0 63~67 Ø3.0~20 69~72		Ø1.0~20 30~45		Ø1.0~20 30~40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E164TX-1	1	20,000	240	20,000	240	20,000	240	20,000	185	20,000	185	10,000	60	9,500	40
E164TX-1.5	1.5	15,000	245	15,000	245	15,000	245	15,000	185	15,000	185	7,100	70	6,300	50
E164TX-2	2	11,000	480	11,000	480	11,000	480	10,000	300	10,000	300	6,400	150	4,800	95
E164TX-2.5	2.5	8,800	600	8,800	600	8,800	600	8,500	350	8,500	350	5,600	170	4,500	100
E164TX/E165TX-3	3	11,500	500	11,500	500	11,500	500	7,300	450	7,300	450	4,800	220	4,000	150
E164TX-3.5	3.5	10,000	510	10,000	510	10,000	510	6,400	475	6,400	475	4,200	235	3,600	185
E164TX/E165TX-4	4	8,600	515	8,600	515	8,600	515	5,600	500	5,600	500	3,600	250	3,200	220
E164TX-4.5	4.5	7,700	515	7,700	515	7,700	515	5,100	525	5,100	525	3,250	265	2,900	220
E164TX/E165TX-5	5	6,800	515	6,800	515	6,800	515	4,500	550	4,500	550	2,900	280	2,600	220
E164TX-5.5	5.5	6,300	515	6,300	515	6,300	515	4,100	575	4,100	575	2,650	290	2,350	220
E164TX/E165TX-6	6	5,800	520	5,800	520	5,800	520	3,700	600	3,700	600	2,400	300	2,100	220
E164TX-7	7	5,050	520	5,050	520	5,050	520	3,250	610	3,250	610	2,100	305	1,850	210
E164TX/E165TX-8	8	4,300	520	4,300	520	4,300	520	2,800	620	2,800	620	1,800	310	1,600	210
E164TX-9	9	3,850	530	3,850	530	3,850	530	2,550	620	2,550	620	1,600	305	1,450	195
E164TX/E165TX-10	10	3,400	540	3,400	540	3,400	540	2,300	620	2,300	620	1,400	300	1,300	180
E164TX-11	11	3,150	545	3,150	545	3,150	545	2,100	620	2,100	620	1,300	300	1,200	165
E164TX/E165TX-12	12	2,900	545	2,900	545	2,900	545	1,900	620	1,900	620	1,200	300	1,100	150
E164TX-14	14	2,650	575	2,650	575	2,650	575	1,650	550	1,650	550	1,050	265	950	125
E164TX/E165TX-16	16	2,400	610	2,400	610	2,400	610	1,400	480	1,400	480	900	230	800	120
E164TX-18	18	2,250	620	2,250	620	2,250	620	1,250	450	1,250	450	810	220	720	105
E164TX/E165TX-20	20	1,950	630	1,950	630	1,950	630	1,100	420	1,100	420	720	210	640	90
切入深度 (mm) 		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:<3 0.02D ≥3 0.05D		ap:1.5D ae:0.02D		ap:1.5D ae:0.02D	

※ Notice: E165TX is Long Length series End Mills. Please adjust the parameter according

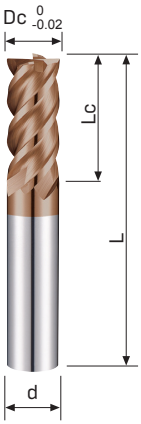
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E165TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E158TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E158TX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●
16	38	100	16	●
20	38	100	20	●



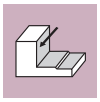
Steel < 62HRC

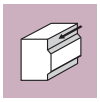
P	H	M	K	N	S
●	●	●	●	○	○

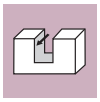
SMG Carbide

AlTiSiN TX

Type of Operation

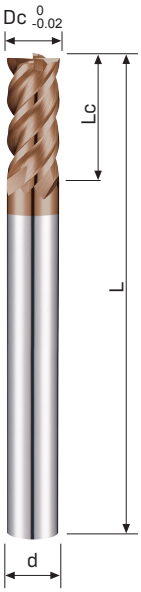






Code No. E159TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E159TX
3	12	70	6	●
4	15	70	6	●
5	20	80	6	●
6	20	80	6	●
8	25	100	8	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

E158TX / E159TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.5 硬化鋼 Hardened Steel (48~56HRC)		GR.5 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		100		100		80		65		62		60		30		62		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E158TX-1	1	31,850	509	31,850	509	25,480	407	20,700	331	19,747	315	19,110	305	9,555	152	19,747	315	31,850	509
E158TX-1.5	1.5	21,233	594	21,233	594	16,986	475	13,800	386	13,164	368	12,740	305	6,370	152	13,164	368	21,233	594
E158TX-2	2	15,925	637	15,925	637	12,740	560	10,351	455	9,873	395	9,555	344	4,777	152	9,873	395	15,925	637
E158TX-2.5	2.5	12,740	764	12,740	764	10,192	611	8,281	496	7,898	473	7,644	458	3,822	152	7,898	473	12,740	764
E158TX-3	3	10,600	950	10,600	950	8,300	750	7,000	560	6,600	510	6,400	480	3,200	180	6,600	510	10,600	950
E158TX-4	4	8,000	1,000	8,000	1,000	6,150	800	5,200	560	5,000	600	4,800	510	2,400	185	5,000	600	8,000	1,000
E158TX-5	5	6,350	1,000	6,350	1,000	5,000	840	4,200	580	4,000	610	3,800	530	2,000	190	4,000	610	6,350	1,000
E158TX/E159TX-6	6	5,300	1,200	5,300	1,200	4,200	950	3,500	700	3,300	650	3,200	540	1,600	190	3,300	650	5,300	1,200
E158TX/E159TX-8	8	4,000	1,200	4,000	1,200	3,100	900	2,700	650	2,500	640	2,400	550	1,200	175	2,500	640	4,000	1,200
E158TX/E159TX-10	10	3,200	1,100	3,200	1,100	2,500	850	2,100	600	2,000	585	1,900	520	950	155	2,000	585	3,200	1,100
E158TX/E159TX-12	12	2,650	1,100	2,650	1,100	2,000	850	1,750	560	1,700	530	1,600	470	800	160	1,700	530	2,650	1,100
E158TX/E159TX-16	16	2,000	950	2,000	950	1,600	730	1,300	500	1,250	430	1,200	400	600	160	1,250	430	2,000	950
E158TX/E159TX-20	20	1,600	760	1,600	760	1,300	580	1,100	450	980	380	950	350	480	160	980	380	1,600	760
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D		ae:0.2D	

※ Notice: E159TX is Long Length series End Mills. Please adjust the parameter according

※注意E159TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

Side Milling (High-speed machining) 側面切削(高速加工)

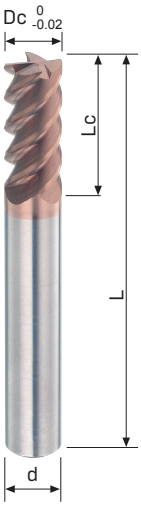
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.5 硬化鋼 Hardened Steel (48~56HRC)		GR.5 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		200		200		200		200		150		100		80		150		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E158TX-3	3	21,233	1,274	21,233	1,274	21,233	1,274	21,233	1,274	15,925	955	10,616	637	8493	509	15,925	955	21,233	1,274
E158TX-4	4	15,925	1,274	15,925	1,274	15,925	1,274	15,925	1,274	11,943	955	7,962	637	6370	509	11,943	955	15,925	1,274
E158TX-5	5	12,740	1,528	12,740	1,528	12,740	1,528	12,740	1,528	9,555	1,146	6,370	764	5096	509	9,555	1146	12,740	1,528
E158TX-6	6	10,500	2,800	10,500	2,800	10,500	2,500	10,500	1,800	8,000	1,350	5,300	900	4,200	600	8,000	1,350	10,500	2,800
E158TX-8	8	8,000	2,400	8,000	2,400	8,000	2,300	8,000	1,700	5,900	1,350	4,000	850	3,200	550	5,900	1,350	8,000	2,400
E158TX-10	10	6,300	2,350	6,300	2,350	6,300	2,200	6,300	1,650	4,700	1,300	3,200	800	2,500	500	4,700	1,300	6,300	2,350
E158TX-12	12	5,300	2,350	5,300	2,350	5,300	2,100	5,300	1,650	4,000	1,300	2,600	785	2,100	480	4,000	1,300	5,300	2,350
E158TX-16	16	4,000	1,800	4,000	1,800	4,000	1,800	4,000	1,600	3,000	1,200	2,000	780	1,600	480	3,000	1,200	4,000	1,800
E158TX-20	20	3,200	1,500	3,200	1,500	3,200	1,500	3,200	1,450	2,400	1,100	1,600	730	1,300	475	2,400	1,100	3,200	1,500
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.0D		ap:1.0D		ap:1.5D		ap:1.5D	
		ae:0.05D		ae:0.02D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.02D		ae:0.02D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E168TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E168TX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●
16	38	100	16	●
20	38	100	20	●

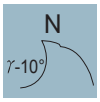


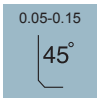
Hardened Steel 40-70HRC

P	H	M	K	N	S
	●				

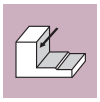
SMG Carbide

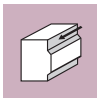
AlTiSiN TX





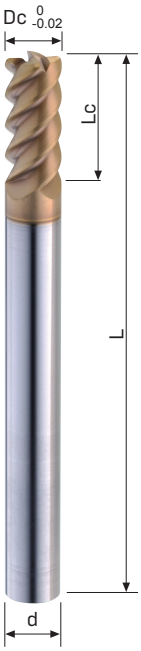
Type of Operation





Code No. E169TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiSiN E169TX
6	20	80	6	●
8	25	100	8	●
10	30	100	10	●
12	40	110	12	●
16	50	140	16	●
20	60	160	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E168TX / E169TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		150		100		50	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E168TX-3	3	15,800	1,200	10,500	820	3,800	120
E168TX-4	4	12,000	1,300	8,000	800	2,650	135
E168TX-5	5	9,500	1,300	6,300	850	2,250	140
E168TX/E169TX-6	6	8,000	1,200	5,300	820	2,200	175
E168TX/E169TX-8	8	6,000	1,100	4,000	750	1,650	185
E168TX/E169TX-10	10	4,800	1,100	3,200	745	1,300	165
E168TX/E169TX-12	12	4,000	1,065	2,700	740	1,100	145
E168TX/E169TX-16	16	3,000	1,000	2,000	730	840	170
E168TX/E169TX-20	20	2,400	955	1,600	700	670	170
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.05D		ae:0.03D		ae:0.02D	

High SpeedSide Milling 高速側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		200		150		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E168TX-3	3	21,233	1,620	15,925	1,130	10,617	424
E168TX-4	4	15,925	1,725	11,944	1,200	7,963	477
E168TX-5	5	12,740	1,750	9,555	1,200	6,370	510
E168TX-6	6	10,617	1,200	7,963	700	5,308	530
E168TX-8	8	7,963	1,200	5,972	700	3,981	530
E168TX-10	10	6,370	850	4,778	630	3,185	420
E168TX-12	12	5,308	850	3,981	630	2,654	420
E168TX-16	16	3,981	900	2,986	650	1,991	420
E168TX-20	20	3,185	900	2,389	650	1,593	420
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.01D		ae:0.01D		ae:0.01D	

※ Notice: E169TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E169TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

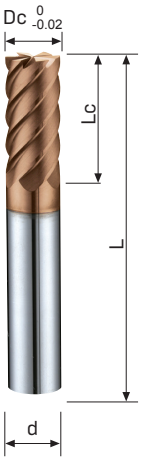
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E166TX / E167TX 極超微粒鎢鋼塗層精加工立銑刀

Finishing End Mills

Code No. E166TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E166TX
3	8	50	6	4	●
4	11	50	6	4	●
5	13	50	6	6	●
6	16	50	6	6	●
8	20	60	8	6	●
10	22	72	10	6	●
12	26	75	12	6	●
16	38	100	16	6	●
20	38	100	20	6	●

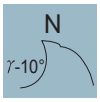


Hardened Steel 40-70HRC

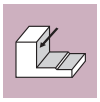
P	H	M	K	N	S
	●		○		

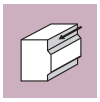
SMG Carbide

AlTiSiN TX



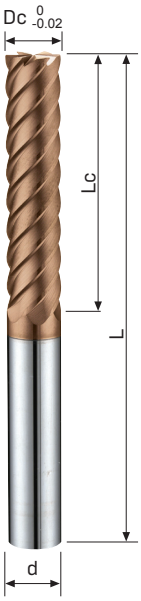
Type of Operation





Code No. E167TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	NO.of Flute	AlTiSiN E167TX
6	26	80	6	6	●
8	36	100	8	6	●
10	46	100	10	6	●
12	56	110	12	6	●
16	66	140	16	6	●
20	76	160	20	6	●



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E166TX / E167TX 切削條件參考表

Recommended Milling Conditions

E166TX Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		150		100		90		145	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E166TX-3	3	13,500	1,600	10,500	1,200	7,900	650	15,000	1,800
E166TX-4	4	9,900	1,600	7,900	1,200	5,900	660	11,000	1,800
E166TX-5	5	7,900	1,580	6,300	1,200	4,700	650	8,800	1,750
E166TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000	7,400	2,600
E166TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000	5,500	2,600
E166TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000	4,500	2,600
E166TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000	3,700	2,600
E166TX-16	16	2,500	2,100	2,000	1,700	1,500	900	2,800	2,400
E166TX-20	20	2,000	1,900	1,600	1,400	1,200	830	2,300	2,100
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.6D	
		ae:0.1D		ae:0.05D		ae:0.03D		ae:0.1D	

E167TX Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		45		35		30		70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E167TX-6	6	2,100	530	1,500	300	1,350	230	3,200	850
E167TX-8	8	1,800	550	1,200	310	1,100	250	2,800	1,000
E167TX-10	10	1,600	550	1,150	340	1,000	260	2,400	1,000
E167TX-12	12	1,300	520	1,000	280	800	230	1,950	970
E167TX-16	16	985	450	700	230	600	200	1,400	800
E167TX-20	20	800	380	570	210	480	160	1,100	660
切入深度 (mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.1D		ae:0.05D		ae:0.05D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

圓頭立銑刀
Ball Nose End Mills

Page	23	25	27	29	29	31
Apperance						
Code No	B222X	B232X B242X B246X	B262TX B263TX B264TX	B272TX	B273TX	B251TX
Carbide	MG Carbide	MG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX
Helix Angle	30°	30°	30°	30°	30°	25°
No.of Flutes	2	2	2	2	2	2

7leaders®
The Art of Cutting

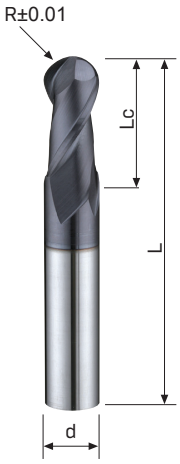
33	35	35	37
			
B261TX	**B253TX**	**B254TX**	**B250TX**
SMG Carbide	**SMG Carbide**	**SMG Carbide**	**UMG Carbide**
AlTiSiN TX	**AlTiSiN TX**	**AlTiSiN TX**	**AlTiSiN TX**
 15°	 45°	 45°	 30°
 2	 3	 4	 2

B222X 超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B222X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B222X
0.1	0.05R	0.2	50	4	●
0.2	0.1R	0.4	50	4	●
0.3	0.15R	0.6	50	4	●
0.4	0.2R	0.8	50	4	●
0.5	0.25R	1	50	4	●
0.6	0.3R	1.2	50	4	●
0.7	0.35R	1.4	50	4	●
0.8	0.4R	1.6	50	4	●
0.9	0.45R	1.8	50	4	●
1	0.5R	2	50	4	●
1.2	0.6R	2.4	50	4	●
1.4	0.7R	2.8	50	4	●
1.5	0.75R	3	50	4	●
1.6	0.8R	3.2	50	4	●
1.8	0.9R	3.6	50	4	●
2	1R	4	50	4	●
2.5	1.25R	5	50	4	●
3 A	1.5R	6	50	4	●
4 A	2R	8	50	4	●
3	1.5R	6	50	6	●
3.5	1.75R	8	50	6	●
4	2R	8	50	6	●
4.5	2.25R	10	50	6	●
5	2.5R	10	50	6	●
5.5	2.75R	12	50	6	●
6	3R	12	50	6	●
6.5	3.25R	14	60	8	●
7	3.5R	14	60	8	●
7.5	3.75R	14	60	8	●
8	4R	14	60	8	●
8.5	4.25R	18	72	10	●
9	4.5R	18	72	10	●
9.5	4.75R	18	72	10	●
10	5R	18	72	10	●
11	5.5R	22	75	12	●
12	6R	22	75	12	●
13	6.5R	26	90	16	●
14	7R	26	90	16	●
15	7.5R	30	90	16	●
16	8R	30	100	16	●
17	8.5R	34	100	20	●
18	9R	34	100	20	●
19	9.5R	38	100	20	●
20	10R	38	100	20	●

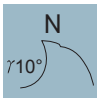


Steel < 48HRC

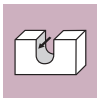
P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiN X-NaNo



Type of Operation



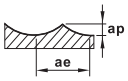
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B222X 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

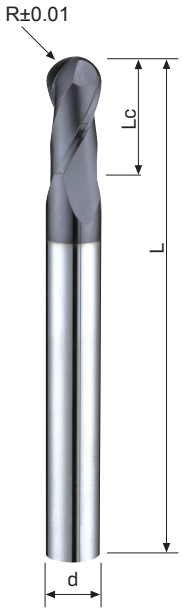
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 20~60 Ø0.8~20 80~100		Ø0.1~0.6 20~60 Ø0.8~20 60~80		Ø0.1~0.6 20~60 Ø0.8~20 60~70		Ø0.1~0.6 20~60 Ø0.8~20 60~80		Ø0.1~0.6 20~60 Ø0.8~20 80~120		Ø0.1~0.6 25~75 Ø0.8~20 100~120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B222X-R0.05	0.1	32,000	140	32,000	140	32,000	140	32,000	120	32,000	120	32,000	100	32,000	140	40,000	180
B222X-R0.1	0.2	32,000	160	32,000	160	32,000	160	32,000	140	32,000	140	32,000	120	32,000	160	40,000	200
B222X-R0.15	0.3	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	40,000	300
B222X-R0.2	0.4	32,000	296	32,000	296	32,000	330	32,000	330	32,000	205	32,000	330	32,000	296	40,000	490
B222X-R0.25	0.5	32,000	395	32,000	395	32,000	330	32,000	330	32,000	205	32,000	330	32,000	395	40,000	490
B222X-R0.3	0.6	32,000	490	32,000	490	32,000	400	32,000	400	32,000	265	32,000	400	32,000	490	40,000	580
B222X-R0.4	0.8	32,000	550	32,000	550	31,500	406	31,500	406	27,500	290	31,500	406	32,000	550	40,000	660
B222X-R0.5	1	31,500	564	31,500	564	25,000	412	25,000	412	22,000	296	25,000	412	31,500	564	32,000	700
B222X-R0.6	1.2	29,190	570	29,190	570	23,880	410	23,880	410	18,580	300	21,250	410	29,195	570	31,850	710
B222X-R0.75	1.5	26,250	578	26,250	578	20,860	418	20,860	418	14,800	302	20,860	418	26,250	578	25,500	715
B222X-R0.9	1.8	21,230	580	21,230	580	17,690	424	17,690	424	12,380	305	17,690	420	23,000	580	23,000	720
B222X-R1	2	21,000	582	21,000	582	16,720	425	16,720	425	11,000	310	16,720	425	21,000	582	19,000	730
B222X-R1.25	2.5	15,750	596	15,750	596	12,580	430	12,580	430	8,900	316	12,580	430	15,750	596	12,700	745
B222X-R1.5	3	10,500	620	10,500	620	8,450	435	8,450	435	7,400	322	8,450	435	10,500	620	12,500	760
B222X-R1.75	3.5	9,840	625	9,840	625	7,350	440	7,350	440	6,400	330	7,350	440	9,840	625	11,000	760
B222X-R2	4	9,250	630	9,250	630	6,350	442	6,350	442	5,550	342	6,350	442	9,250	630	9,500	765
B222X-R1.25	4.5	8,600	635	8,600	635	5,700	445	5,700	445	5,100	355	5,700	445	8,600	635	8,600	770
B222X-R2.5	5	7,950	640	7,950	640	5,095	447	5,095	447	4,460	377	5,095	447	7,950	640	7,650	775
B222X-R2.75	5.5	6,600	645	6,600	645	4,650	450	4,650	450	4,050	380	4,650	450	6,600	645	6,950	780
B222X-R3	6	5,300	670	5,300	670	4,200	465	4,200	465	3,700	390	4,200	465	5,300	670	6,300	800
B222X-R3.5	7	4,600	730	4,600	730	3,700	510	3,700	510	3,200	420	3,700	510	4,600	730	5,500	870
B222X-R4	8	3,950	790	3,950	790	3,150	555	3,150	555	2,750	455	3,150	555	3,950	790	4,750	950
B222X-R4.5	9	3,550	765	3,550	765	2,825	540	2,825	540	2,450	440	2,825	540	3,550	765	4,250	920
B222X-R5	10	3,150	745	3,150	745	2,500	525	2,500	525	2,200	430	2,500	525	3,150	745	3,800	890
B222X-R5.5	11	2,900	720	2,900	720	2,300	505	2,300	505	2,000	430	2,300	505	2,900	720	3,470	865
B222X-R6	12	2,650	700	2,650	700	2,100	490	2,100	490	1,850	430	2,100	490	2,650	700	3,170	840
B222X-R6.5	13	2,450	655	2,450	655	1,960	460	1,960	460	1,730	400	1,960	460	2,450	655	2,970	790
B222X-R7	14	2,300	610	2,300	610	1,830	430	1,830	430	1,620	375	1,830	430	2,300	610	2,780	730
B222X-R7.5	15	2,150	565	2,150	565	1,700	400	1,700	400	1,500	350	1,700	400	2,150	565	2,590	680
B222X-R8	16	1,990	525	1,990	525	1,580	370	1,580	370	1,390	325	1,580	370	1,990	525	2,400	630
B222X-R8.5	17	1,890	495	1,890	495	1,500	350	1,500	350	1,320	305	1,500	350	1,890	495	2,270	590
B222X-R9	18	1,790	470	1,790	470	1,420	330	1,420	330	1,250	290	1,420	330	1,790	470	2,150	560
B222X-R9.5	19	1,690	445	1,690	445	1,340	310	1,340	310	1,180	275	1,340	310	1,690	445	2,020	530
B222X-R10	20	1,590	420	1,590	420	1,260	290	1,260	290	1,110	260	1,260	290	1,590	420	1,900	500
切入深度 (mm) 		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.05D ≥1 0.1D		ap:0.1D ae:<1 0.05D ≥1 0.1D		ap:0.1D ae:<1 0.1D ≥1 0.2D		ap:0.1D ae:<1 0.1D ≥1 0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. B232X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B232X
1	0.5R	2	50	6	●
1.5	0.75R	3	50	6	●
2	1R	4	60	6	●
2.5	1.25R	5	60	6	●
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
7	3.5R	14	100	8	●
8	4R	14	100	8	●
9	4.5R	18	100	10	●
10	5R	18	100	10	●
12	6R	22	110	12	●
14	7R	26	120	16	●
16	8R	30	140	16	●
20	10R	38	160	20	●

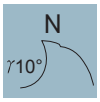


Steel < 48HRC

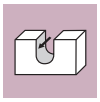
P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiN X-NaNo

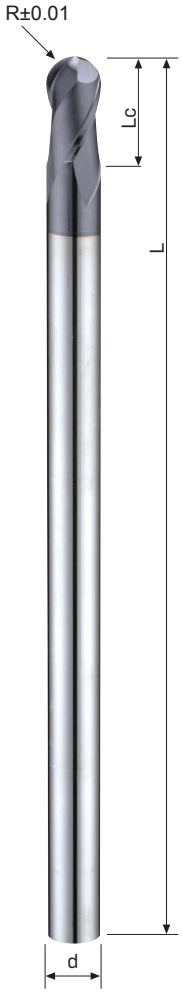


Type of Operation



Code No. B242X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B242X
1	0.5R	2	70	3	●
2	1R	4	70	3	●
3	1.5R	6	80	4	●
4	2R	8	80	4	●
5	2.5R	10	100	6	●
6	3R	12	100	6	●
8	4R	14	130	8	●
10	5R	18	160	10	●
12	6R	22	180	12	●
16	8R	30	210	16	●
20	10R	38	210	20	●



Code No. B246X-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B246X
2	1R	4	100	3	●
4	2R	8	130	4	●
6	3R	12	160	6	●
8	4R	14	180	8	●
10	5R	18	200	10	●
12	6R	22	210	12	●

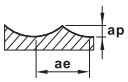
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B232X / B242X / B246X 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		100		100		65		65		55		65		100		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B232X/B242X-R0.5	1	25,200	480	25,200	480	20,000	320	20,000	320	17,600	225	20,000	320	25,200	480	25,600	560
B232X-R0.75	1.5	16,640	480	16,640	480	13,600	320	13,600	320	11,840	225	13,600	320	16,640	480	20,400	560
B232X/B242X/B246X-R1	2	12,400	480	12,400	480	10,000	320	10,000	320	8,800	230	10,000	320	12,400	480	15,200	560
B232X-R1.25	2.5	12,400	480	12,400	480	8,160	320	8,160	320	7,120	230	8,160	320	12,400	480	10,160	560
B232X/B242X-R1.5	3	8,400	500	8,400	500	6,760	325	6,760	325	5,920	230	6,760	325	8,400	500	10,000	608
B232X/B242X/B246X-R2	4	6,360	500	6,360	500	5,080	355	5,080	355	4,440	300	5,080	355	6,360	500	7,600	608
B232X/B242X-R2.5	5	6,360	500	6,360	500	4,070	355	4,070	355	3,568	300	4,070	355	6,360	500	6,120	608
B232X/B242X/B246X-R3	6	4,240	535	4,240	535	3,360	370	3,360	370	2,960	310	3,360	370	4,240	535	5,040	640
B232X/B242X/B246X-R4	8	3,160	630	3,160	630	2,520	445	2,520	445	2,200	360	2,520	445	3,160	630	3,800	760
B232X/B242X/B246X-R5	10	2,520	600	2,520	600	2,000	420	2,000	420	1,760	340	2,000	420	2,520	600	3,040	710
B232X/B242X/B246X-R6	12	2,120	560	2,120	560	1,680	390	1,680	390	1,480	340	1,680	390	2,120	560	2,530	670
B232X/B242X-R8	16	1,590	420	1,590	420	1,260	295	1,260	295	1,110	260	1,260	295	1,590	420	1,920	500
B232X/B242X-R10	20	1,270	335	1,270	335	1,000	230	1,000	230	888	200	1,000	230	1,270	335	1,520	400
切入深度 (mm) 		ap:0.1D ae:0.2D		ap:0.1D ae:0.2D		ap:0.1D ae:0.2D		ap:0.1D ae:0.2D		ap:0.1D ae:0.1D		ap:0.1D ae:0.1D		ap:0.1D ae:0.2D		ap:0.1D ae:0.2D	

※ Notice: B242X&B246X is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意B242X&B246X為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. B262TX-Dc

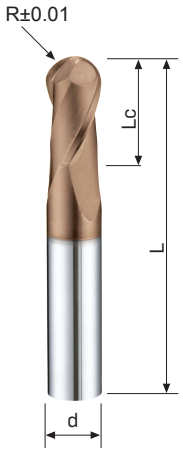
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B262TX
0.1	0.05R	0.2	50	4	●
0.2	0.1R	0.4	50	4	●
0.3	0.15R	0.6	50	4	●
0.4	0.2R	0.8	50	4	●
0.5	0.25R	1	50	4	●
0.6	0.3R	1.2	50	4	●
0.8	0.4R	1.6	50	4	●
1	0.5R	2	50	4	●
1.5	0.75R	3	50	4	●
2	1R	4	50	4	●
2.5	1.25R	5	50	4	●
3 A	1.5R	6	50	4	●
4 A	2R	8	50	4	●
3	1.5R	6	50	6	●
4	2R	8	50	6	●
5	2.5R	10	50	6	●
6	3R	12	50	6	●
7	3.5R	14	60	8	●
8	4R	14	60	8	●
9	4.5R	18	72	10	●
10	5R	18	72	10	●
12	6R	22	75	12	●
14	7R	26	90	16	●
16	8R	30	100	16	●
20	10R	38	100	20	●

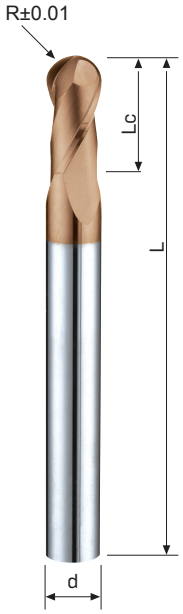
Code No. B263TX-Dc

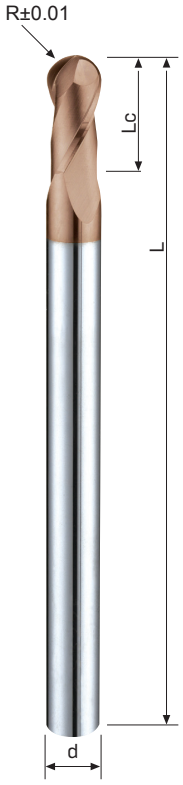
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B263TX
1	0.5R	2	50	6	●
1.5	0.75R	3	50	6	●
2	1R	4	60	6	●
2.5	1.25R	5	60	6	●
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
7	3.5R	14	100	8	●
8	4R	14	100	8	●
9	4.5R	18	100	10	●
10	5R	18	100	10	●
12	6R	22	110	12	●
14	7R	26	120	16	●
16	8R	30	140	16	●
20	10R	38	160	20	●

Code No. B264TX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B264TX
1	0.5R	2	70	3	●
2	1R	4	70	3	●
3	1.5R	6	80	4	●
4	2R	8	80	4	●
5	2.5R	10	100	6	●
6	3R	12	100	6	●
8	4R	14	130	8	●
10	5R	18	160	10	●
12	6R	22	180	12	●
16	8R	30	210	16	●
20	10R	38	210	20	●







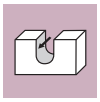
Steel < 62HRC

P	H	M	K	N	S
●	●		○		

SMG Carbide

AlTiSiN TX

Type of Operation



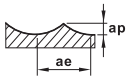
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

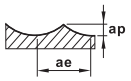
B262TX / B263TX / B264TX 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		Ø0.1~0.6 30~60 Ø0.8~20 80~120		Ø0.1~0.6 30~60 Ø0.8~20 80~120		Ø0.1~0.6 30~60 Ø0.8~20 80~100		Ø0.1~0.6 30~60 Ø0.8~20 73~80		Ø0.1~0.6 30~60 Ø0.8~20 65~70		Ø0.1~0.6 23~46 Ø0.8~20 48~60		Ø0.1~0.6 20~35 Ø0.8~20 35~42	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B262TX-R0.05	0.1	32,000	320	32,000	320	32,000	300	32,000	250	24,500	160	24,500	100	24,500	50
B262TX-R0.1	0.2	32,000	360	32,000	360	32,000	320	32,000	280	24,500	180	24,500	100	24,500	75
B262TX-R0.15	0.3	32,000	400	32,000	400	32,000	365	32,000	300	32,000	180	24,500	100	24,500	75
B262TX-R0.2	0.4	32,000	450	32,000	450	32,000	400	32,000	320	32,000	200	24,500	130	24,500	115
B262TX-R0.25	0.5	32,000	485	32,000	485	32,000	440	32,000	360	32,000	230	24,500	150	24,500	130
B262TX-R0.3	0.6	32,000	530	32,000	530	31,500	480	32,000	400	32,000	260	24,500	170	23,500	150
B262TX-R0.4	0.8	32,000	605	32,000	605	31,500	550	29,000	400	27,000	270	19,000	185	14,000	140
B262TX/B263TX/B264TX-R0.5	1	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
B262TX/B263TX-R0.75	1.5	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
B262TX/B263TX/B264TX-R1	2	19,000	765	19,000	765	15,500	620	12,500	400	11,000	290	9,500	200	7,100	135
B262TX/B263TX-R1.25	2.5	19,000	765	19,000	765	15,500	620	12,500	400	11,000	290	9,500	200	6,360	135
B262TX/B236TX/B264TX-R1.5	3	12,500	765	12,500	765	10,500	630	8,450	400	7,400	290	6,350	200	4,700	140
B262TX/B236TX/B264TX-R2	4	9,500	765	9,500	765	7,950	630	6,350	450	5,550	370	4,750	270	3,500	170
B262TX/B236TX/B264TX-R2.5	5	7,600	850	7,600	850	6,350	630	5,050	450	4,450	370	3,800	280	2,860	170
B262TX/B236TX/B264TX-R3	6	6,350	850	6,350	850	5,300	650	4,200	460	3,700	390	3,150	290	2,300	175
B262TX/B263TX-R3.5	7	5,050	950	5,050	950	4,650	710	3,650	500	3,200	420	2,750	305	2,000	190
B262TX/B236TX/B264TX-R4	8	4,750	1,050	4,750	1,050	3,950	780	3,150	550	2,750	450	2,350	325	1,700	200
B262TX/B263TX-R4.5	9	4,250	1,000	4,250	1,000	3,550	760	2,850	535	2,450	440	2,120	330	1,550	200
B262TX/B236TX/B264TX-R5	10	3,800	950	3,800	950	3,150	740	2,500	525	2,200	430	1,900	330	1,400	200
B262TX/B236TX/B264TX-R6	12	3,150	890	3,150	890	2,650	700	2,100	490	1,850	430	1,550	310	1,100	190
B262TX/B263TX-R7	14	2,700	860	2,700	860	2,250	670	1,800	475	1,550	380	1,350	300	955	180
B262TX/B236TX/B264TX-R8	16	2,350	840	2,350	840	1,950	640	1,550	475	1,350	380	1,150	265	835	175
B262TX/B236TX/B264TX-R10	20	1,900	760	1,900	760	1,750	570	1,400	450	1,100	350	955	250	665	170
切入深度 (mm) 		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:<1 0.05D ≥1 0.1D		ap:0.05D		ap:0.05D	
		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:<1 0.1D ≥1 0.1D		ae:0.075D		ae:0.075D	

High-speed machining 高速加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		Ø1~3 157~198 Ø4~20 226~300		Ø1~3 157~198 Ø4~20 226~300		Ø1~3 155~165 Ø4~20 195~250		Ø1~3 140~160 Ø4~20 188~220		Ø1~3 125~153 Ø4~20 170~180		Ø1~3 100~113 Ø4~20 138~180		Ø1~3 79~92 Ø4~20 119~126	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B262TX/B263TX/B264TX-R0.5	1	50,000	2,800	50,000	2,800	50,000	2,800	50,000	2,500	47,500	2,200	32,000	1,400	25,000	1,000
B262TX/B263TX-R0.75	1.5	41,800	2,800	41,800	2,800	33,000	2,800	30,000	2,500	26,500	2,200	24,000	1,400	19,500	1,000
B262TX/B263TX/B264TX-R1	2	31,500	3,500	31,500	3,500	25,000	2,800	24,500	2,500	23,500	2,250	17,000	1,500	12,500	1,000
B262TX/B263TX-R1.25	2.5	41,800	3,500	41,800	3,500	21,000	2,800	20,000	25,000	19,500	2,200	14,000	1,500	10,000	950
B262TX/B236TX/B264TX-R1.5	3	21,000	3,500	21,000	3,500	16,500	2,800	16,000	2,500	15,500	2,200	11,000	1,500	8,400	950
B262TX/B236TX/B264TX-R2	4	18,000	3,700	18,000	3,700	15,500	3,200	15,000	2,700	13,500	2,400	11,000	1,900	7,900	1,000
B262TX/B236TX/B264TX-R2.5	5	15,500	4,000	15,500	4,000	15,000	4,000	14,000	2,800	11,000	2,300	10,000	2,000	7,600	1,200
B262TX/B236TX/B264TX-R3	6	15,000	4,800	15,000	4,800	13,500	4,300	11,500	2,700	9,500	2,200	9,500	2,200	6,600	1,050
B262TX/B236TX/B264TX-R4	8	11,500	3,600	11,500	3,600	10,000	3,200	8,900	2,000	7,100	1,700	7,100	1,700	4,900	880
B262TX/B236TX/B264TX-R5	10	9,500	3,000	9,500	3,000	8,200	2,500	7,100	1,700	5,700	1,300	5,700	1,300	3,900	700
B262TX/B236TX/B264TX-R6	12	7,900	2,450	7,900	2,450	6,800	2,100	5,900	1,350	4,700	1,000	4,700	1,000	3,300	580
B262TX/B236TX/B264TX-R8	16	5,900	1,800	5,900	1,800	5,000	1,500	4,500	1,000	3,500	800	3,500	800	2,450	400
B262TX/B236TX/B264TX-R10	20	4,700	1,300	4,700	1,300	4,000	1,200	3,500	800	2,800	650	2,800	650	2,000	320
切入深度 (mm) 		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D	

※ Notice: B263TX/B264TX is Long Length series End Mills. Please adjust the parameter according

※注意B263TX/B264TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

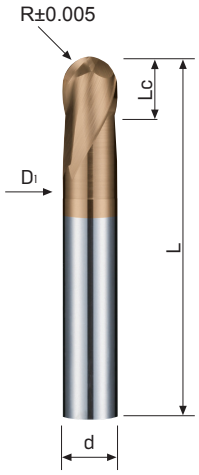
B272TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B272TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	AlTiSiN B272TX
0.1	0.05R	0.1	40	4	●
0.2	0.1R	0.2	40	4	●
0.3	0.15R	0.3	40	4	●
0.4	0.2R	0.4	40	4	●
0.5	0.25R	0.5	40	4	●
0.6	0.3R	0.6	40	4	●
0.8	0.3R	0.8	40	4	●
1	0.5R	1	40	4	●
1.5	0.75R	1.5	40	4	●
2	1R	2	45	6	●
2.5	1.25R	2.5	45	6	●
3	1.5R	3	45	6	●
4	2R	4	45	6	●
5	2.5R	5	50	6	●
6	3R	6	50	6	●
8	4R	8	60	8	●
10	5R	10	72	10	●
12	6R	12	75	12	●

※Suitable in: Heat-shrinkage shank
※適用：熱縮刀柄用

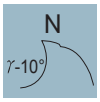


Hardened Steel 40-70HRC

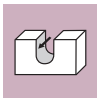
P	H	M	K	N	S
	●				

SMG Carbide

AlTiSiN TX



Type of Operation



Work Material

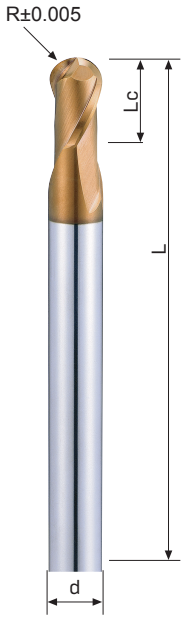
P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B273TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B273TX-Dc

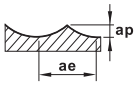
Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	AlTiSiN B273TX
1	0.5R	1.5	50	4	●
1.5	0.75R	2.5	50	4	●
2	1R	3	50	6	●
2.5	1.25R	4	50	6	●
3	1.5R	4.5	70	6	●
4	2R	6	70	6	●
5	2.5R	7.5	80	6	●
6	3R	9	80	6	●
8	4R	12	100	8	●
10	5R	15	100	10	●
12	6R	18	110	12	●



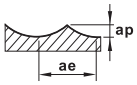
B272TX / B273TX 切削條件參考表

Recommended Milling Conditions

Finishing 精加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		130		120		90	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B272TX-R0.25	0.5	20,000	700	17,000	650	17,000	600
B272TX/B273TX-R0.5	1	20,000	800	15,000	750	15,000	750
B272TX/B273TX-R0.75	1.5	18,000	1,400	15,000	900	14,000	900
B272TX/B273TX-R1	2	15,000	1,600	14,000	1,200	14,000	1,260
B273TX-R1.25	2.5	14,000	1,700	13,000	1,500	10,000	1,200
B272TX/B273TX-R1.5	3	13,000	1,700	12,500	1,500	10,000	1,200
B272TX/B273TX-R2	4	11,000	1,680	10,000	1,560	7,200	1,080
B272TX/B273TX-R2.5	5	10,000	1,600	9,600	1,440	6,800	1,080
B272TX/B273TX-R3	6	6,900	1,450	6,400	1,280	4,800	960
B272TX/B273TX-R4	8	5,200	1,200	4,800	1,060	3,600	790
B272TX/B273TX-R5	10	4,100	1,030	3,800	910	2,900	700
B272TX/B273TX-R6	12	3,500	910	3,200	800	2,400	600
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

High-speed machining 高速加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		235		130		115	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B272TX-R0.25	0.5	50,000	1,450	40,000	1,100	40,000	900
B272TX/B273TX-R0.5	1	30,000	1,700	24,000	2,000	21,000	1,700
B272TX/B273TX-R0.75	1.5	30,000	2,400	17,000	2,000	15,000	1,700
B272TX/B273TX-R1	2	28,000	2,800	14,000	2,100	12,200	1,800
B273TX-R1.25	2.5	24,000	2,850	12,500	2,100	10,500	1,800
B272TX/B273TX-R1.5	3	21,000	3,000	10,500	2,200	9,000	1,750
B272TX/B273TX-R2	4	18,000	3,200	9,000	2,300	7,900	2,000
B272TX/B273TX-R2.5	5	15,500	3,300	7,800	2,500	6,800	2,000
B272TX/B273TX-R3	6	13,000	3,450	6,500	2,500	5,700	2,200
B272TX/B273TX-R4	8	9,500	3,000	5,200	2,100	4,500	1,900
B272TX/B273TX-R5	10	7,500	2,500	4,200	1,800	3,700	1,700
B272TX/B273TX-R6	12	6,200	2,000	3,600	1,700	3,100	1,450
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

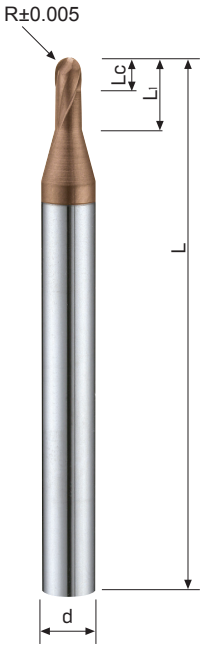
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B251TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B251TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	L1 mm	AlTiSiN B251TX
0.1	0.05R	0.1	50	4	0.3	●
0.2	0.1R	0.2	50	4	0.5	●
0.3	0.15R	0.3	50	4	0.8	●
0.4	0.2R	0.4	50	4	1	●
0.5	0.25R	0.5	50	4	1.3	●
0.6	0.3R	0.6	50	4	1.5	●
0.8	0.4R	0.8	50	4	2	●
1	0.5R	1	50	4	2.5	●
1.5	0.75R	1.5	50	4	3.8	●
2	1R	2	50	6	5	●
3	1.5R	3	60	6	8	●
4	2R	4	60	6	10	●
5	2.5R	5	60	6	12	●
6	3R	6	60	6	15	●



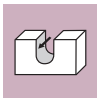
Hardened Steel 40-70HRC

P	H	M	K	N	S
	●				

SMG Carbide

AlTiSiN TX

Type of Operation



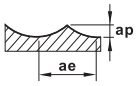
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

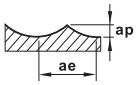
B251TX 切削條件參考表

Recommended Milling Conditions

Finishing 精加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		130		120		90	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B251TX-R0.15	0.3	40,000	500	30,000	400	30,000	350
B251TX-R0.2	0.4	40,000	500	30,000	400	30,000	350
B251TX-R0.25	0.5	40,000	600	30,000	500	30,000	400
B251TX-R0.3	0.6	30,000	600	30,000	500	30,000	500
B251TX-R0.4	0.8	30,000	700	20,000	600	30,000	600
B251TX-R0.5	1	20,000	800	15,000	750	15,000	750
B251TX-R0.75	1.5	18,000	1,400	15,000	900	14,000	900
B251TX-R1	2	15,000	1,600	14,000	1,200	14,000	1,260
B251TX-R1.5	3	13,000	1,700	12,500	1,500	10,000	1,200
B251TX-R2	4	11,000	1,680	10,000	1,560	7,200	1,080
B251TX-R2.5	5	10,000	1,600	9,600	1,440	6,800	1,080
B251TX-R3	6	6,900	1,450	6,400	1,280	4,800	960
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

High-speed machining 高速加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		200		175		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B251TX-R0.15	0.3	50,000	950	40,000	720	40,000	600
B251TX-R0.2	0.4	50,000	1,200	40,000	900	40,000	800
B251TX-R0.25	0.5	50,000	1,400	40,000	1,000	40,000	930
B251TX-R0.3	0.6	50,000	1,600	40,000	1,200	40,000	1,300
B251TX-R0.4	0.8	50,000	2,000	40,000	1,500	40,000	1,400
B251TX-R0.5	1	50,000	2,500	40,000	1,900	32,000	1,400
B251TX-R0.75	1.5	46,000	3,000	32,000	2,000	25,000	1,600
B251TX-R1	2	35,000	3,300	25,000	2,500	20,000	1,750
B251TX-R1.5	3	23,000	3,200	19,000	2,500	13,000	1,800
B251TX-R2	4	17,500	3,300	14,000	2,500	9,800	1,600
B251TX-R2.5	5	14,000	3,300	11,000	2,500	7,900	1,700
B251TX-R3	6	11,500	3,000	9,500	2,500	6,500	1,700
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

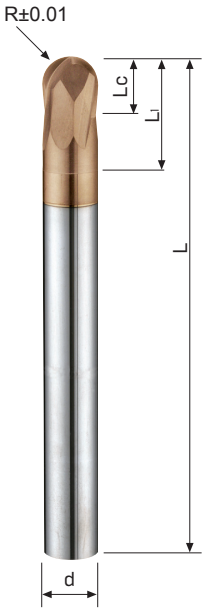
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B261TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B261TX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	AlTiSiN B261TX
1	0.5R	1	50	4	2	●
1.5	0.75R	1.5	50	4	3	●
2	1R	2	60	6	4	●
3	1.5R	3	70	6	6	●
4	2R	4	70	6	8	●
5	2.5R	5	80	6	10	●
6	3R	6	80	6	12	●
8	4R	8	100	8	16	●
10	5R	10	100	10	20	●
12	6R	12	110	12	24	●

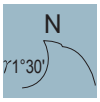


Hardened Steel 40-70HRC

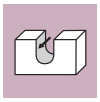
P	H	M	K	N	S
	●				

SMG Carbide

AlTiSiN TX



Type of Operation



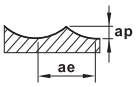
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

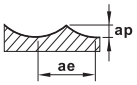
B261TX 切削條件參考表

Recommended Milling Conditions

Finishing 精加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		230		200		180	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B261TX-R0.5	1	40,000	1,000	31,500	800	23,000	600
B261TX-R0.75	1.5	34,000	1,000	26,000	800	19,200	600
B261TX-R1	2	26,500	1,300	22,000	1,000	16,200	800
B261TX-R1.5	3	25,500	2,300	21,000	1,800	15,500	1,500
B261TX-R2	4	21,000	2,350	17,300	1,800	12,800	1,400
B261TX-R2.5	5	18,000	2,300	14,800	1,850	11,000	1,380
B261TX-R3	6	12,000	2,300	10,500	2,000	9,500	1,800
B261TX-R4	8	9,100	1,700	7,900	1,500	7,100	1,300
B261TX-R5	10	7,300	1,400	6,300	1,200	5,700	1,000
B261TX-R6	12	6,000	1,200	5,300	1,000	4,700	950
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

High-speed machining 高速加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		320		250		180	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B261TX-R3	6	17,500	4,000	13,000	3,000	10,000	2,000
B261TX-R4	8	13,000	3,000	9,800	2,300	7,500	1,500
B261TX-R5	10	10,500	2,500	7,900	1,800	6,000	1,200
B261TX-R6	12	8,700	2,000	6,600	1,500	5,000	1,000
切入深度 (mm) 		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D		ap:0.02D ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

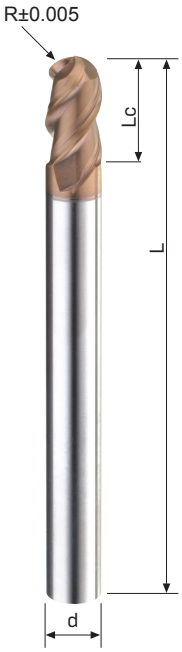
B253TX 極超微粒鎢鋼塗層3刃圓頭立銑刀

Ball Nose End Mills - 3 Flutes

SMG Carbide | AlTiSiN TX | 45° | 3 | N γ-10°

Code No. B253TX-Dc

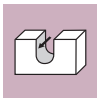
Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B253TX
6	3	12	80	6	●
8	4	14	100	8	●
10	5	18	100	10	●
12	6	22	110	12	●



Hardened Steel 40-70HRC

P	H	M	K	N	S
	●		○		○

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

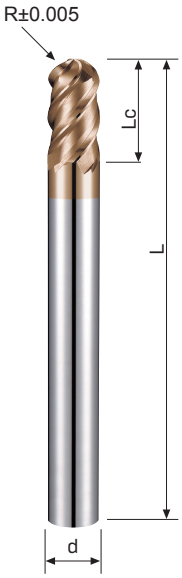
B254TX 極超微粒鎢鋼塗層4刃圓頭立銑刀

Ball Nose End Mills - 4 Flutes

SMG Carbide | AlTiSiN TX | 45° | 4 | N γ-10°

Code No. B254TX-Dc

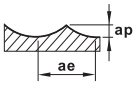
Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h6	AlTiSiN B254TX
3	1.5R	6	70	6	●
4	2R	8	70	6	●
5	2.5R	10	80	6	●
6	3R	12	80	6	●
8	4R	14	100	8	●
10	5R	18	100	10	●
12	6R	22	110	12	●
16	8R	30	140	16	●
20	10R	38	160	20	●



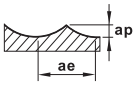
B253TX / B254TX 切削條件參考表

Recommended Milling Conditions

High feed machining　高進給加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.6 硬化鋼 Hardened Steel （48~56HRC）		GR.7 硬化鋼 Hardened Steel （56~68HRC）	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B253TX-R3	6	8000~3200	2700~1200	6400~2500	1900~830	4800~1900	1500~700
B253TX-R4	8	6000~2400	2600~1000	4800~1900	1900~800	3800~1500	1500~600
B253TX-R5	10	4800~1900	3400~1400	3800~1500	2400~1000	3000~1000	1600~800
B253TX-R6	12	4000~1600	2400~1000	3200~1300	1700~1100	2200~800	1350~600
切入深度 （mm） 		ap:0.075~0.015		ap:0.075~0.015		ap:0.075~0.015	
		ae:0.2~0.18		ae:0.2~0.18		ae:0.2~0.18	

Finishing　精加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.6 硬化鋼 Hardened Steel （48~56HRC）		GR.7 硬化鋼 Hardened Steel （56~68HRC）	
切削速度 Vc m/min		280		220		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B254TX-R1.5	3	29,000	6,560	23,000	4,500	21,100	4,240
B254TX-R2	4	22,000	6,250	17,100	4,000	15,800	3,520
B254TX-R2.5	5	17,500	5,600	13,600	3,500	12,700	3,200
B254TX-R3	6	15,000	5,000	11,400	3,000	10,600	2,500
B254TX-R4	8	11,000	4,200	8,550	2,500	7,950	2,250
B254TX-R5	10	9,000	3,500	6,850	2,150	6,350	2,000
B254TX-R6	12	7,500	3,000	5,700	2,000	5,300	1,900
B254TX-R8	16	5,500	3,000	4,280	2,000	4,000	1,900
B254TX-R10	20	4,500	3,000	3,500	2,000	3,200	1,900
切入深度 （mm） 		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

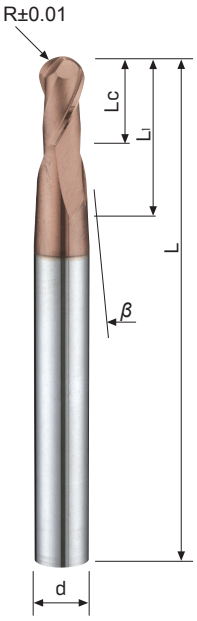
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B250TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. B250TX-R×β

R ±0.01	β on Side	Lc mm	L mm	d h6	L1 mm	AlTiSiN B250TX
0.5R	1° 30'	2	60	6	23	●
0.5R	5°	2	60	6	23	●
0.5R	3°	2	80	6	42	●
1R	1° 30'	4	60	6	23	●
1R	5°	4	60	6	23	●
1R	3°	4	80	6	41	●
1.5R	3°	6	70	6	32	●
1.5R	1° 30'	6	90	6	52	●
2R	3°	8	70	6	28	●
2R	1° 30'	8	90	6	49	●
2.5R	3°	10	90	8	41	●
2.5R	1° 30'	10	110	8	61	●
3R	3°	12	90	8	34	●
3R	1° 30'	12	110	8	53	●
4R	3°	14	100	10	36	●
4R	1° 30'	14	120	10	55	●
5R	3°	18	110	12	40	●
5R	1° 30'	18	130	12	59	●
6R	3°	22	140	16	63	●
6R	1° 30'	22	160	16	83	●



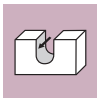
Steel < 62HRC

P	H	M	K	N	S
●	●		○		

UMG Carbide

AlTiSiN TX

Type of Operation



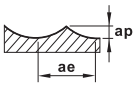
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B250TX 切削條件參考表

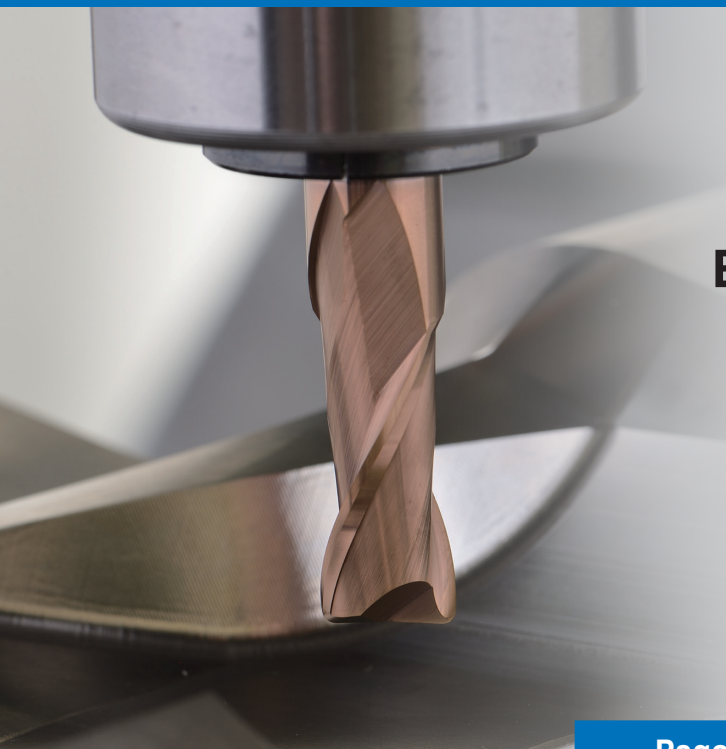
Recommended Milling Conditions

General processing 普通加工

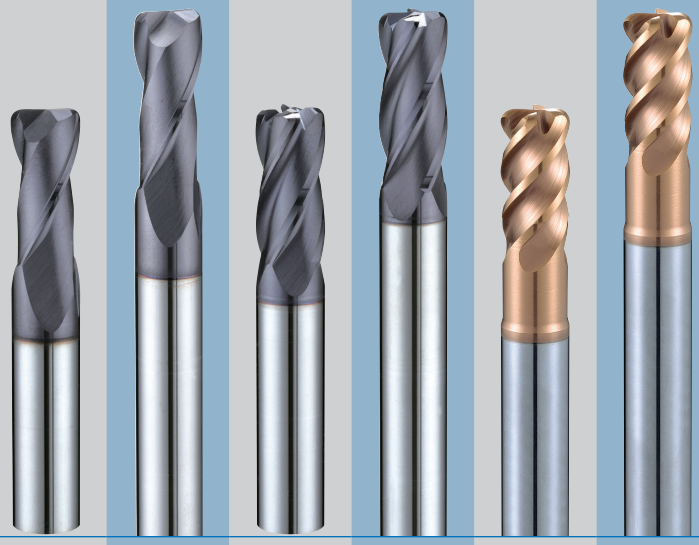
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		85		85		65		65		45		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B250TX-R0.5	1	20,000	125	20,000	125	15,000	120	15,000	120	11,000	65	7,100	30
B250TX-R1	2	11,000	130	11,000	130	85,000	120	85,000	120	6,400	70	4,000	40
B250TX-R1.5	3	5,900	230	5,900	230	5,000	190	5,000	190	3,500	90	2,150	45
B250TX-R2	4	5,300	310	5,300	310	4,200	230	4,200	230	2,950	90	1,850	55
B250TX-R2.5	5	4,400	305	4,400	305	3,500	230	3,500	230	2,450	100	1,500	55
B250TX-R3	6	3,300	290	3,300	290	2,600	230	2,600	230	1,850	95	1,200	50
B250TX-R4	8	2,600	275	2,600	275	2,100	220	2,100	220	1,450	95	950	50
B250TX-R5	10	2,200	275	2,200	275	1,750	220	1,750	220	1,200	90	800	45
B250TX-R6	12	2,650	700	2,650	700	2,100	490	2,100	490	1,850	430	2,100	490
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



R角立銑刀
End Mills With Corner Radius

Page	41	43	45	47	49	51
Apperance						
Code No	B255X	B257X	B256X	B258X	B275TX	B277TX
Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	SMG Carbide	SUMG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiSiN TX	AlTiSiN TX
Helix Angle	30°	30	30°	30°	45°	45°
No.of Flutes	2	2	不等 4	不等 4	4	4

7leaders®
The Art of Cutting

53	53	55	57	59	61	61	63	63	65
									
B259TX	B269TX	B271TX	F676TX	E105X	E106X	E107X	E108X	E109X	E110HX E120HX
SMG Carbide	SMG Carbide	SMG Carbide	UMG Carbide	UMG Carbide	MG Carblde	MG Carbide	UMG Carbide	UMG Carbide	MG Carbide
AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiN X-NaNo	AlTiCrN HX
 45°	 45°	 0°	 0°	 30°	 30°	 30°	 0°	 0°	 15°
 6	 6	 4	 4	 2	 2	 2	 4	 4	 3~6Z

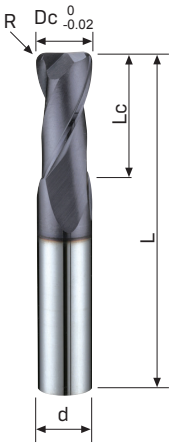
B255X 極超微粒鎢鋼塗層R角立銑刀

End Mills With Corner Radius

Code No. B255X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B255X
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R1.5	22	72	10	●
10	R2	22	72	10	●
10	R3	22	72	10	●

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B255X
12	R0.2	26	75	12	●
12	R0.3	26	75	12	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R1.5	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●
16	R0.5	38	100	16	●
16	R1	38	100	16	●
16	R1.5	38	100	16	●
16	R2	38	100	16	●
16	R3	38	100	16	●
16	R4	38	100	16	●
20	R0.5	38	100	20	●
20	R1	38	100	20	●
20	R1.5	38	100	20	●
20	R2	38	100	20	●
20	R3	38	100	20	●
20	R4	38	100	20	●
20	R5	38	100	20	●



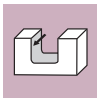
Steel < 56HRC

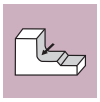
P	H	M	K	N	S
●	●	○	●	○	

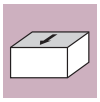
UMG Carbide

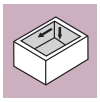
AlTiN X-NaNo

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.6 硬化鋼 Hardened Steel （48~56HRC）		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 62~70 Ø3.1~20 75~80		Ø1.0~3.0 40~50 Ø3.1~20 53~55		Ø1.0~3.0 34~40 Ø3.1~20 44~50		Ø1.0~3.0 22~25 Ø3.1~20 28~30		Ø1.0~3.0 62~70 Ø3.1~20 75~80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B255X-1	1	19,500	120	19,500	120	14,500	120	12,500	85	11,000	65	7,000	30	19,500	120
B255X-1.5	1.5	14,000	120	14,000	120	10,500	120	8,500	85	8,000	65	5,000	40	14,000	120
B255X-2	2	11,000	130	11,000	130	8,350	120	7,000	85	6,300	70	3,900	40	11,000	130
B255X-2.5	2.5	9,900	115	9,900	115	7,000	130	6,000	85	5,000	70	3,500	40	9,900	115
B255X-3	3	7,500	190	7,500	190	6,350	150	5,300	100	4,350	75	2,700	40	7,500	190
B255X-4	4	6,000	225	6,000	225	4,900	180	4,200	120	3,500	90	2,200	50	6,000	225
B255X-5	5	5,200	300	5,200	300	4,300	230	3,500	125	3,000	100	1,900	55	5,200	300
B255X-6	6	4,500	300	4,500	300	3,600	230	2,900	120	2,500	100	1,600	55	4,500	300
B255X-8	8	3,300	280	3,300	280	2,700	230	2,200	120	1,900	100	1,100	50	3,300	280
B255X-10	10	2,600	270	2,600	270	2,100	220	1,700	120	1,500	90	950	50	2,600	270
B255X-12	12	2,200	270	2,200	270	1,800	210	1,450	125	1,200	95	800	45	2,200	270
B255X-16	16	1,600	250	1,600	250	1,350	190	1,100	100	950	85	600	35	1,600	250
B255X-20	20	1,300	200	1,300	200	1,050	150	880	75	750	65	480	30	1,300	200
切入深度 （mm）		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap:≤3 0.3D >3 0.5D		ap：0.05D		ap:≤3 0.3D >3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

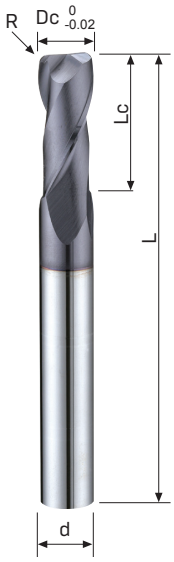
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B257X 極超微粒鎢鋼塗層R角立銑刀

End Mills With Corner Radius

Code No. B257X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B257X
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1	15	60	4	●
5	R0.2	18	70	5	●
5	R0.3	18	70	5	●
5	R0.5	18	70	5	●
5	R1	18	70	5	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
6	R2	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●
8	R1.5	25	100	8	●
8	R2	25	100	8	●
8	R3	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	100	10	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●
16	R0.5	50	140	16	●
16	R1	50	140	16	●
16	R1.5	50	140	16	●
16	R2	50	140	16	●
16	R3	50	140	16	●
16	R4	50	140	16	●
20	R0.5	60	160	20	●
20	R1	60	160	20	●
20	R1.5	60	160	20	●
20	R2	60	160	20	●
20	R3	60	160	20	●
20	R4	60	160	20	●
20	R5	60	160	20	●



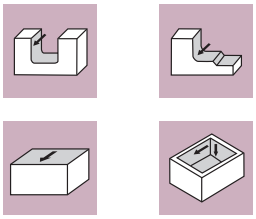
Steel < 56HRC

P	H	M	K	N	S
●	●	○	●	○	

UMG Carbide

AlTiN X-NaNo

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80		80		80		55		50		30		80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B257X-3	3	7,500	190	7,500	190	6,350	150	5,300	100	4,350	75	2,700	40	7,500	190
B257X-4	4	6,000	225	6,000	225	4,900	180	4,200	120	3,500	90	2,200	50	6,000	225
B257X-5	5	5,200	300	5,200	300	4,300	230	3,500	125	3,000	100	1,900	55	5,200	300
B257X-6	6	4,500	300	4,500	300	3,600	230	2,900	120	2,500	100	1,600	55	4,500	300
B257X-8	8	3,300	280	3,300	280	2,700	230	2,200	120	1,900	100	1,100	50	3,300	280
B257X-10	10	2,600	270	2,600	270	2,100	220	1,700	120	1,500	90	950	50	2,600	270
B257X-12	12	2,200	270	2,200	270	1,800	210	1,450	125	1,200	95	800	45	2,200	270
B257X-16	16	1,600	250	1,600	250	1,350	190	1,100	100	950	85	600	35	1,600	250
B257X-20	20	1,300	200	1,300	200	1,050	150	880	75	750	65	480	30	1,300	200
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap：0.05D		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

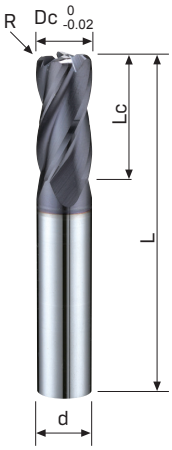
B256X 極超微粒鎢鋼塗層R角立銑刀

End Mills With Corner Radius

Code No. B256X-Dc×R

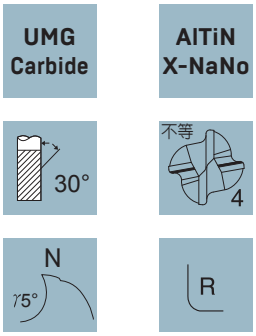
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B256X
1	R0.1	3	50	4	●
1	R0.2	3	50	4	●
1	R0.3	3	50	4	●
1.5	R0.1	5	50	4	●
1.5	R0.2	5	50	4	●
1.5	R0.3	5	50	4	●
1.5	R0.5	5	50	4	●
2	R0.1	6	50	4	●
2	R0.2	6	50	4	●
2	R0.3	6	50	4	●
2	R0.5	6	50	4	●
2.5	R0.1	8	50	4	●
2.5	R0.2	8	50	4	●
2.5	R0.3	8	50	4	●
2.5	R0.5	8	50	4	●
3A	R0.1	8	50	4	●
3A	R0.2	8	50	4	●
3A	R0.3	8	50	4	●
3A	R0.5	8	50	4	●
4A	R0.1	11	50	4	●
4A	R0.2	11	50	4	●
4A	R0.3	11	50	4	●
4A	R0.5	11	50	4	●
4A	R1	11	50	4	●
3	R0.1	8	50	6	●
3	R0.2	8	50	6	●
3	R0.3	8	50	6	●
3	R0.5	8	50	6	●
4	R0.1	11	50	6	●
4	R0.2	11	50	6	●
4	R0.3	11	50	6	●
4	R0.5	11	50	6	●
4	R1	11	50	6	●
5	R0.2	13	50	6	●
5	R0.3	13	50	6	●
5	R0.5	13	50	6	●
5	R1	13	50	6	●
6	R0.2	16	50	6	●
6	R0.3	16	50	6	●
6	R0.5	16	50	6	●
6	R1	16	50	6	●
6	R1.5	16	50	6	●
6	R2	16	50	6	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
8	R1.5	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
10	R0.2	22	72	10	●
10	R0.3	22	72	10	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
10	R1.5	22	72	10	●
10	R2	22	72	10	●
10	R3	22	72	10	●

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B256X
12	R0.2	26	75	12	●
12	R0.3	26	75	12	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
12	R1.5	26	75	12	●
12	R2	26	75	12	●
12	R3	26	75	12	●
16	R0.5	38	100	16	●
16	R1	38	100	16	●
16	R1.5	38	100	16	●
16	R2	38	100	16	●
16	R3	38	100	16	●
16	R4	38	100	16	●
20	R0.5	38	100	20	●
20	R1	38	100	20	●
20	R1.5	38	100	20	●
20	R2	38	100	20	●
20	R3	38	100	20	●
20	R4	38	100	20	●
20	R5	38	100	20	●

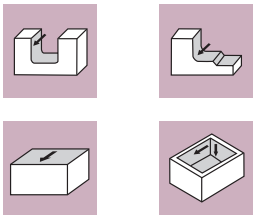


Steel < 56HRC

P	H	M	K	N	S
●	●	○	●	○	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B256X 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 60~80 Ø3.0~20 80~85	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B256X-1	1	20,000	240	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	20,000	240
B256X-1.5	1.5	13,500	245	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	13,500	245
B256X-2	2	13,000	300	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	13,000	300
B256X-2.5	2.5	10,000	320	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	10,000	320
B256X-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,800	500
B256X-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,600	530
B256X-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,300	600
B256X-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,500	610
B256X-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,300	590
B256X-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	580
B256X-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,200	580
B256X-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	530
B256X-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	510
切入深度 (mm) 		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:<3 0.05D ≥3 0.1D		ap:1.5D ae:0.02D		ap:1.5D ae:<3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

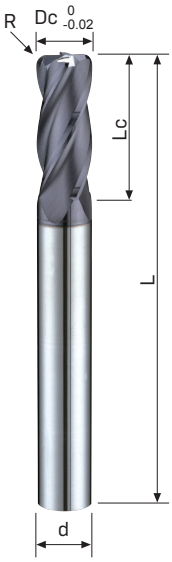
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B258X 極超微粒鎢鋼塗層R角立銑刀

End Mills With Corner Radius

Code No. B258X-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiN B258X
3	R0.1	10	50	3	●
3	R0.2	10	50	3	●
3	R0.3	10	50	3	●
3	R0.5	10	50	3	●
4	R0.1	15	60	4	●
4	R0.2	15	60	4	●
4	R0.3	15	60	4	●
4	R0.5	15	60	4	●
4	R1	15	60	4	●
5	R0.2	18	70	5	●
5	R0.3	18	70	5	●
5	R0.5	18	70	5	●
5	R1	18	70	5	●
6	R0.2	20	80	6	●
6	R0.3	20	80	6	●
6	R0.5	20	80	6	●
6	R1	20	80	6	●
6	R1.5	20	80	6	●
6	R2	20	80	6	●
8	R0.2	25	100	8	●
8	R0.3	25	100	8	●
8	R0.5	25	100	8	●
8	R1	25	100	8	●
8	R1.5	25	100	8	●
8	R2	25	100	8	●
8	R3	25	100	8	●
10	R0.2	30	100	10	●
10	R0.3	30	100	10	●
10	R0.5	30	100	10	●
10	R1	30	100	10	●
10	R1.5	30	100	10	●
10	R2	30	100	10	●
10	R3	30	100	10	●
12	R0.2	40	110	12	●
12	R0.3	40	110	12	●
12	R0.5	40	110	12	●
12	R1	40	110	12	●
12	R1.5	40	110	12	●
12	R2	40	110	12	●
12	R3	40	110	12	●
16	R0.5	50	140	16	●
16	R1	50	140	16	●
16	R1.5	50	140	16	●
16	R2	50	140	16	●
16	R3	50	140	16	●
16	R4	50	140	16	●
20	R0.5	60	160	20	●
20	R1	60	160	20	●
20	R1.5	60	160	20	●
20	R2	60	160	20	●
20	R3	60	160	20	●
20	R4	60	160	20	●
20	R5	60	160	20	●



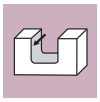
Steel < 56HRC

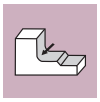
P	H	M	K	N	S
●	●	○	●	○	

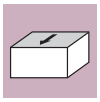
UMG Carbide

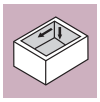
AlTiN X-NaNo

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B258X 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		85		85		75		70		60		30		85	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B258X-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,800	500
B258X-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,600	530
B258X-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,300	600
B258X-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,500	610
B258X-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,300	590
B258X-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	580
B258X-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,200	580
B258X-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	530
B258X-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	510
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.02D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

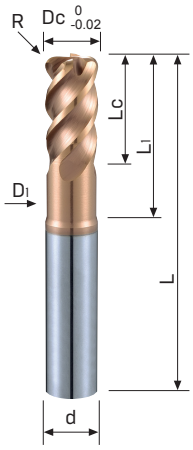
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B275TX 極超微粒鎢鋼塗層高效能R角立銑刀

High Performance End Mills With Corner Radius

Code No. B275TX-Dc

Dc $^{0}_{-0.02}$	R ±0.01	Lc mm	L mm	d h6	L_1 mm	D_1 mm	AlTiSiN B275TX
3	R0.2	5	50	6	8	2.85	●
3	R0.5	5	50	6	8	2.85	●
4	R0.2	6	50	6	10	3.8	●
4	R0.5	6	50	6	10	3.8	●
5	R0.2	8	50	6	13	4.8	●
5	R0.5	8	50	6	13	4.8	●
6	R0.2	9	50	6	15	5.7	●
6	R0.5	9	50	6	15	5.7	●
6	R1	9	50	6	15	5.7	●
6	R1.5	9	50	6	15	5.7	●
8	R0.2	12	60	8	20	7.6	●
8	R0.5	12	60	8	20	7.6	●
8	R1	12	60	8	20	7.6	●
8	R2	12	60	8	20	7.6	●
10	R0.2	15	75	10	25	9.5	●
10	R0.5	15	75	10	25	9.5	●
10	R1	15	75	10	25	9.5	●
10	R2	15	75	10	25	9.5	●
12	R0.2	18	80	12	30	11.4	●
12	R0.5	18	80	12	30	11.4	●
12	R1	18	80	12	30	11.4	●
12	R2	18	80	12	30	11.4	●
16	R0.5	24	100	16	40	15.2	●
16	R1	24	100	16	40	15.2	●
16	R2	24	100	16	40	15.2	●
16	R3	24	100	16	40	15.2	●
20	R0.5	30	110	20	50	19	●
20	R1	30	110	20	50	19	●
20	R2	30	110	20	50	19	●
20	R3	30	110	20	50	19	●



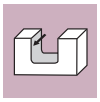
Steel < 62HRC

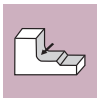
P	H	M	K	N	S
●	●	●	●		○

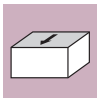
SMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

B275TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼/GR.2 低合金鋼/GR.3 高合金鋼 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4 硬化鋼/GR.5 硬化鋼 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		170		150		100		50		60		150	
型號 Code No.	刃徑 (Dc)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B275TX-3	3	18048	1444	15,800	1,200	10,500	820	3,800	120	6370	510	15,800	1,200
B275TX-4	4	13536	1624	12,000	1,300	8,000	800	2,650	135	4778	573	12,000	1,300
B275TX-5	5	10829	1733	9,500	1,300	6,300	850	2,250	140	3822	612	9,500	1,300
B275TX-6	6	9024	1805	8,000	1,200	5,300	820	2,200	175	3185	637	8,000	1,200
B275TX-8	8	6768	1624	6,000	1,100	4,000	750	1,650	185	2389	573	6,000	1,100
B275TX-10	10	5415	1516	4,800	1,100	3,200	745	1,300	165	1911	535	4,800	1,100
B275TX-12	12	4512	1444	4,000	1,065	2,700	740	1,100	145	1593	510	4,000	1,065
B275TX-16	16	3384	1218	3,000	1,000	2,000	730	840	170	1194	430	3,000	1,000
B275TX-20	20	2707	1083	2,400	955	1,600	700	670	170	956	382	2,400	955
切入深度 (mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.03D		ae:0.02D		ae:0.03D		ae:0.05D	

High SpeedSide Milling 高速側面切削

被削材 Work Material		GR.1 碳鋼/GR.2 低合金鋼/GR.3 高合金鋼 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4 硬化鋼/GR.5 硬化鋼 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		250		200		150		100		100		200	
型號 Code No.	刃徑 (Dc)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B275TX-3	3	26542	2123	21233	850	15925	630	10617	424	10617	849	21233	850
B275TX-4	4	19906	2389	15925	900	11944	630	7963	477	7963	956	15925	900
B275TX-5	5	15925	2548	12740	1000	9555	650	6370	510	6370	1019	12740	1000
B275TX-6	6	13271	2654	10617	1200	7963	700	5308	530	5308	1062	10617	1200
B275TX-8	8	9953	2389	7963	1200	5972	700	3981	530	3981	956	7963	1200
B275TX-10	10	7963	2230	6370	850	4778	630	3185	420	3185	892	6370	850
B275TX-12	12	6635	2123	5308	850	3981	630	2654	420	2654	849	5308	850
B275TX-16	16	4977	1792	3981	900	2986	650	1991	420	1991	717	3981	900
B275TX-20	20	3981	1593	3185	900	2389	650	1593	420	1593	637	3185	900
切入深度 (mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.03D		ae:0.01D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

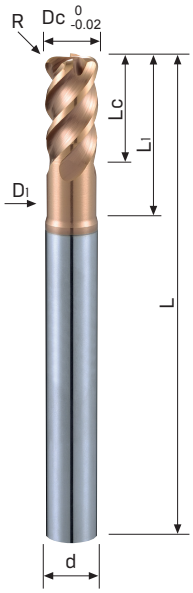
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B277TX 極超微粒鎢鋼塗層高效能R角立銑刀

High Performance End Mills With Corner Radius

Code No. B277TX-Dc

Dc $^{0}_{-0.02}$	R ±0.01	Lc mm	L mm	d h6	L_1 mm	D_1 mm	AlTiSiN B277TX
6	R0.2	9	80	6	18	5.7	●
6	R0.5	9	80	6	18	5.7	●
6	R1	9	80	6	18	5.7	●
6	R1.5	9	80	6	18	5.7	●
8	R0.2	12	100	8	24	7.6	●
8	R0.5	12	100	8	24	7.6	●
8	R1	12	100	8	24	7.6	●
8	R2	12	100	8	24	7.6	●
10	R0.2	15	100	10	30	9.5	●
10	R0.5	15	100	10	30	9.5	●
10	R1	15	100	10	30	9.5	●
10	R2	15	100	10	30	9.5	●
12	R0.2	18	110	12	36	11.4	●
12	R0.5	18	110	12	36	11.4	●
12	R1	18	110	12	36	11.4	●
12	R2	18	110	12	36	11.4	●
16	R0.5	24	140	16	48	15.2	●
16	R1	24	140	16	48	15.2	●
16	R2	24	140	16	48	15.2	●
16	R3	24	140	16	48	15.2	●
20	R0.5	30	160	20	60	19	●
20	R1	30	160	20	60	19	●
20	R2	30	160	20	60	19	●
20	R3	30	160	20	60	19	●



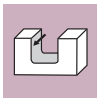
Steel < 62HRC

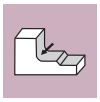
P	H	M	K	N	S
●	●	●	●		○

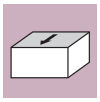
SMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼/GR.2 低合金鋼/GR.3 高合金鋼 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4 硬化鋼/GR.5 硬化鋼 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		150		130		100		50		60		150	
型號 Code No.	刃徑 (Dc)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B277TX-6	6	7963	1593	7,200	1,080	5,300	820	2,200	175	3185	637	8,000	1,200
B277TX-8	8	5972	1433	5,400	990	4,000	750	1,650	185	2389	573	6,000	1,100
B277TX-10	10	4778	1338	4,320	990	3,200	745	1,300	165	1911	535	4,800	1,100
B277TX-12	12	3981	1274	3,600	959	2,700	740	1,100	145	1593	510	4,000	1,065
B277TX-16	16	2986	1075	2,700	900	2,000	730	840	170	1194	430	3,000	1,000
B277TX-20	20	2389	956	2,160	860	1,600	700	670	170	956	382	2,400	955
切入深度 (mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.03D		ae:0.02D		ae:0.03D		ae:0.05D	

High SpeedSide Milling 高速側面切削

被削材 Work Material		GR.1 碳鋼/GR.2 低合金鋼/GR.3 高合金鋼 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)		GR.4 硬化鋼/GR.5 硬化鋼 Hardened Steel/Hardened Steel (30~38HRC) (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		200		180		150		100		100		200	
型號 Code No.	刃徑 (Dc)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B277TX-6	6	10617	2123	9554	1080	7963	700	5308	530	5308	1062	10617	1200
B277TX-8	8	7963	1911	7166	1080	5972	700	3981	530	3981	956	7963	1200
B277TX-10	10	6370	1784	5733	765	4778	630	3185	420	3185	892	6370	850
B277TX-12	12	5308	1699	4777	765	3981	630	2654	420	2654	849	5308	850
B277TX-16	16	3981	1433	3583	810	2986	650	1991	420	1991	717	3981	900
B277TX-20	20	3185	1274	2867	810	2389	650	1593	420	1593	637	3185	900
切入深度 (mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.03D		ae:0.01D	

※ Notice: B277TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意B277TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

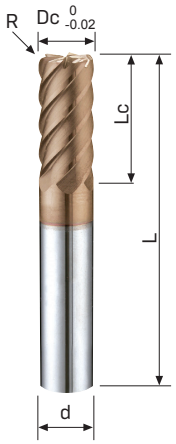
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B259TX / B269TX 極超微粒鎢鋼塗層精加工R角立銑刀

Finishing End Mills With Corner Radius

Code No. B259TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B259TX
6	R0.5	16	50	6	●
6	R1	16	50	6	●
8	R0.5	20	60	8	●
8	R1	20	60	8	●
10	R0.5	22	72	10	●
10	R1	22	72	10	●
12	R0.5	26	75	12	●
12	R1	26	75	12	●
16	R1	38	100	16	●
16	R2	38	100	16	●
20	R1	38	100	20	●
20	R2	38	100	20	●

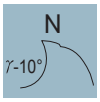


Hardened Steel 40-70HRC

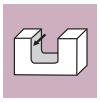
P	H	M	K	N	S
	●		○		

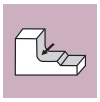
SMG Carbide

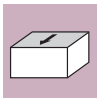
AlTiSiN TX

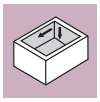


Type of Operation



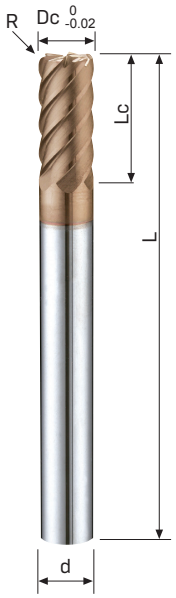






Code No. B269TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B269TX
6	R0.5	16	80	6	●
6	R1	16	80	6	●
8	R0.5	20	100	8	●
8	R1	20	100	8	●
10	R0.5	22	100	10	●
10	R1	22	100	10	●
12	R0.5	26	110	12	●
12	R1	26	110	12	●
16	R1	38	140	16	●
16	R2	38	140	16	●
20	R1	38	160	20	●
20	R2	38	160	20	●



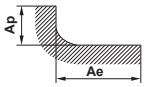
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B259TX / B269TX 切削條件參考表

Recommended Milling Conditions

High feed cutting 高進給切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		200		180		160		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B259TX/B269TX	6	10,617	2,548	9,555	2,293	8,493	2,038	10,617	2,548
B259TX/B269TX	8	7,963	2,389	7,166	2,150	6,370	2,293	7,963	2,389
B259TX/B269TX	10	6,370	3,058	5,733	2,752	5,096	2,446	6,370	3,058
B259TX/B269TX	12	5,308	3,185	4,778	2,867	4,247	2,548	5,308	3,185
B259TX/B269TX	16	3,981	2,867	3,583	2,580	3,185	2,293	3,981	2,867
B259TX/B269TX	20	3,185	2,293	2,867	2,064	2,548	1,835	3,185	2,293
切入深度 (mm) 		ap:0.2×R		ap:0.2×R		ap:0.1×R		ap:0.2×R	
		ae:0.5D		ae:0.5D		ae:0.5D		ae:0.5D	

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		150		100		90		145	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B259TX/B269TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000	7,400	2,600
B259TX/B269TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000	5,500	2,600
B259TX/B269TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000	4,500	2,600
B259TX/B269TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000	3,700	2,600
B259TX/B269TX-16	16	2,500	2,100	2,000	1,700	1,500	900	2,800	2,400
B259TX/B269TX-20	20	2,000	1,900	1,600	1,400	1,200	830	2,300	2,100
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.6D	
		ae:0.1D		ae:0.05D		ae:0.03D		ae:0.1D	

※ Notice: B269TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意B269TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

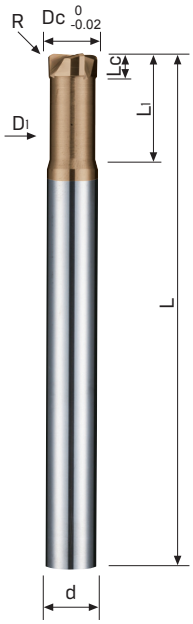
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B271TX 極超微粒鎢鋼塗層高效能R角立銑刀

High Performance End Mills With Corner Radius

Code No. B271TX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	AlTiSiN B271TX
3	R0.75	1.2	70	6	7.5	2.7	●
4	R1	1.6	70	6	10	3.6	●
5	R1	2	80	6	12	4.5	●
5	R1.2	2	80	6	12	4.5	●
6	R1	2.5	80	6	12	5.4	●
6	R1.5	2.5	80	6	12	5.4	●
8	R1	3.5	100	8	16	7.2	●
8	R2	3.5	100	8	16	7.2	●
10	R1	4	100	10	20	9	●
10	R2	4	100	10	20	9	●
12	R1	5	110	12	24	11	●
12	R2	5	110	12	24	11	●
12	R3	5	110	12	24	11	●

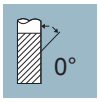


Hardened Steel 40-70HRC

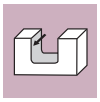
P	H	M	K	N	S
	●		●		

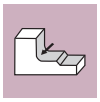
SMG Carbide

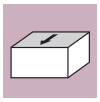
AlTiSiN TX



Type of Operation



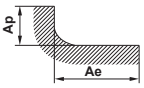




Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

High feed cutting 高進給切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		70		50		30		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B271TX-3	3	7,400	3,800	5,300	2,500	3,200	990	10,500	6,000
B271TX-4	4	5,500	4,100	4,000	2,700	2,400	1,000	8,000	6,500
B271TX-5	5	4,450	4,300	3,200	2,800	1,900	1,100	6,350	6,800
B271TX-6	6	3,700	4,300	2,600	2,800	1,600	1,100	5,300	6,800
B271TX-8	8	2,800	4,300	2,000	2,800	1,200	1,100	4,000	7,000
B271TX-10	10	2,250	4,400	1,600	2,800	1,000	1,100	3,200	7,000
B271TX-12	12	1,850	4,400	1,350	2,800	800	1,100	2,650	7,000
切入深度 (mm) 		ap:0.2xR		ap:0.2xR		ap:0.1xR		ap:0.2xR	
		ae:0.5D		ae:0.5D		ae:0.5D		ae:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

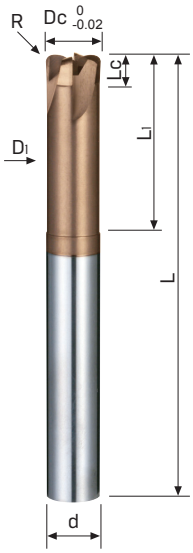
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F676TX 極超微粒鎢鋼塗層快進給立銑刀

High Feed End Mills

Code No. F676TX-Dc

Dc 0 -0.02	Progrmmable Radius	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F676TX
3	0.37	2	70	6	12	2.8	●
4	0.47	2	70	6	16	3.7	●
5	0.6	2.5	70	6	20	4.6	●
6	0.73	3	70	6	25	5.5	●
8	0.98	4	80	8	30	7.4	●
10	1.23	5	90	10	35	9.2	●
12	1.65	6	100	12	40	11	●

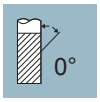


Steel < 70HRC

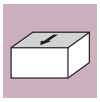
P	H	M	K	N	S
○	●		○		

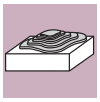
UMG Carbide

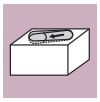
AlTiSiN TX



Type of Operation



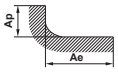




Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

High feed machining 高進給加工

被削材 Work Material		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		80		70		50		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F676TX-3	3	8,500	4,500	7,400	3,800	5,300	2,500	3,200	990
F676TX-4	4	6,350	4,800	5,500	4,100	4,000	2,700	2,400	1,000
F676TX-5	5	5,000	5,000	4,450	4,300	3,200	2,800	1,900	1,100
F676TX-6	6	4,300	5,000	3,700	4,300	2,600	2,800	1,600	1,100
F676TX-8	8	3,200	5,000	2,800	4,300	2,000	2,800	1,200	1,100
F676TX-10	10	2,550	5,100	2,250	4,400	1,600	2,800	1,000	1,100
F676TX-12	12	2,100	5,100	1,850	4,400	1,350	2,800	800	1,100
切入深度 (mm) 		ap:0.2×R		ap:0.2×R		ap:0.2×R		ap:0.1×R	
		ae:0.5D		ae:0.5D		ae:0.5D		ae:0.5D	

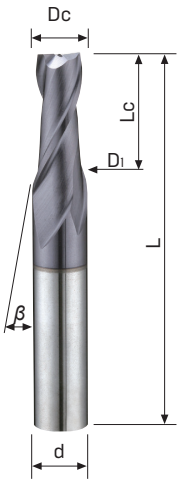
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E105X-Dc×β

Dc mm	β on Side	D1 mm	Lc mm	L mm	d h6	AlTiN E105X
1	30'	1.07	4	50	4	●
1	1°	1.14	4	50	4	●
1	1°30'	1.21	4	50	4	●
1	2°	1.28	4	50	4	●
1	2°30'	1.35	4	50	4	●
1	3°	1.42	4	50	4	●
1	4°	1.56	4	50	4	●
1	5°	1.7	4	50	4	●
1	6°	1.84	4	50	4	●
1	7°	1.98	4	50	4	●
1	10°	2.41	4	50	4	●
1.5	30'	1.59	5	50	4	●
1.5	1°	1.67	5	50	4	●
1.5	1°30'	1.76	5	50	4	●
1.5	2°	1.85	5	50	4	●
1.5	2°30'	1.93	5	50	4	●
1.5	3°	2.02	5	50	4	●
1.5	4°	2.2	5	50	4	●
1.5	5°	2.37	5	50	4	●
1.5	6°	2.55	5	50	4	●
1.5	7°	2.73	5	50	4	●
1.5	10°	3.26	5	50	4	●
2	30'	2.1	6	50	4	●
2	1°	2.21	6	50	4	●
2	1°30'	2.31	6	50	4	●
2	2°	2.41	6	50	4	●
2	2°30'	2.52	6	50	4	●
2	3°	2.62	6	50	4	●
2	4°	2.84	6	50	4	●
2	5°	3.05	6	50	4	●
2	6°	3.26	6	50	4	●
2	7°	3.47	6	50	4	●
2	10°	4.11	6	50	6	●
2.5	30'	2.64	8	50	4	●
2.5	1°	2.78	8	50	4	●
2.5	1°30'	2.91	8	50	4	●
2.5	2°	3.05	8	50	4	●
2.5	2°30'	3.2	8	50	4	●
2.5	3°	3.33	8	50	4	●
2.5	4°	3.62	8	50	4	●
2.5	5°	3.9	8	50	4	●
2.5	6°	4.18	8	50	6	●
2.5	7°	4.46	8	50	6	●
2.5	10°	5.32	8	50	6	●
3	30'	3.17	10	50	6	●
3	1°	3.35	10	50	6	●
3	1°30'	3.52	10	50	6	●
3	2°	3.69	10	50	6	●
3	2°30'	3.87	10	50	6	●
3	3°	4.05	10	50	6	●
3	4°	4.4	10	50	6	●
3	5°	4.75	10	50	6	●
3	6°	5.1	10	50	6	●
3	7°	5.46	10	50	6	●
3	10°	6.53	10	60	8	●

Dc mm	β on Side	D1 mm	Lc mm	L mm	d h6	AlTiN E105X
4	30'	4.26	15	50	6	●
4	1°	4.52	15	50	6	●
4	1°30'	4.79	15	50	6	●
4	2°	5.04	15	50	6	●
4	2°30'	5.31	15	50	6	●
4	3°	5.57	15	50	6	●
4	4°	6.1	15	60	8	●
4	5°	6.62	15	60	8	●
4	6°	7.15	15	60	8	●
4	7°	7.68	15	60	8	●
4	10°	9.3	15	70	10	●
5	30'	5.34	20	60	6	●
5	1°	5.7	20	60	6	●
5	1°30'	6	20	60	6	●
5	2°	6.39	20	60	8	●
5	2°30'	6.75	20	60	8	●
5	3°	7.1	20	60	8	●
5	4°	7.8	20	60	8	●
5	5°	8.5	20	70	10	●
5	6°	9.2	20	70	10	●
5	7°	9.91	20	70	10	●
5	10°	12	20	75	12	●
6	30'	6.35	20	60	8	●
6	1°	6.7	20	60	8	●
6	1°30'	7.05	20	60	8	●
6	2°	7.4	20	60	8	●
6	2°30'	7.75	20	60	8	●
6	3°	8	20	60	8	●
6	4°	8.8	20	70	10	●
6	5°	9.5	20	70	10	●
6	6°	10.2	20	75	12	●
6	7°	10.91	20	75	12	●
6	10°	13.05	20	75	12	●
8	30'	8.44	25	70	10	●
8	1°	8.87	25	70	10	●
8	1°30'	9.31	25	70	10	●
8	2°	9.74	25	70	10	●
8	2°30'	10	25	70	10	●
8	3°	10.62	25	75	12	●
8	5°	12.37	25	90	12	●
10	30'	10.61	35	90	10	●
10	1°	11.22	35	90	10	●
10	1°30'	11.83	35	90	10	●
10	2°	12.44	35	90	12	●
10	2°30'	13.06	35	90	12	●
10	3°	13.67	35	90	12	●
10	5°	16	35	100	16	●

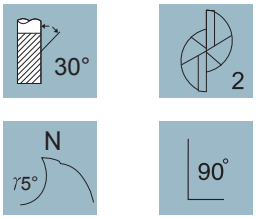


Steel < 60HRC

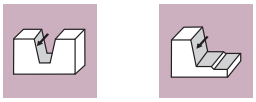
P	H	M	K	N	S
●	●		○	○	

UMG Carbide

AlTiN X-NaNo



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E105X 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		60		60		60		45		40		35	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E105X-1	1	15,500	120	15,500	120	15,500	120	13,000	85	12,000	80	10,500	35
E105X-1.5	1.5	10,500	120	10,500	120	10,500	120	9,000	85	8,200	80	7,000	35
E105X-2	2	7,900	145	7,900	145	7,900	120	6,600	85	6,300	80	5,200	35
E105X-2.5	2.5	6,200	140	6,200	140	6,200	115	5,300	85	4,900	80	4,200	35
E105X-3	3	5,100	140	5,100	140	5,100	120	4,400	80	4,000	80	3,500	35
E105X-4	4	3,800	140	3,800	140	3,800	115	3,400	80	3,000	80	2,500	35
E105X-5	5	3,100	140	3,100	140	3,100	115	2,600	80	2,400	75	2,000	35
E105X-6	6	2,600	140	2,600	140	2,600	115	2,200	80	2,000	75	1,700	35
E105X-8	8	1,900	140	1,900	140	1,900	115	1,600	80	1,500	75	1,300	35
E105X-10	10	1,500	140	1,500	140	1,500	110	1,300	80	1,200	75	1,000	35
切入深度 (mm) 		ap:2.5		ap:2.5		ap:2.5		ap:2.5		ap:2.5		ap:2.5	
		ae:0.02		ae:0.02		ae:0.02		ae:0.02		ae:0.02		ae:0.02	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E106X 超微粒鎢鋼塗層倒角用立銑刀60°

End Mills For Chamfering 60°

MG Carbide | AlTiN X-NaNo | 30° | 2 | N γ5° | 60°

Code No. E106X-Dc

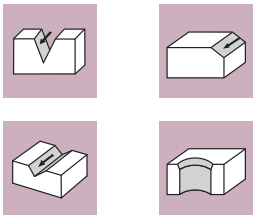
Dc 0 -0.02	Lc mm	L mm	d h6	Blank E106	AlTiN E106X
1	2	38	3	●	●
2	4	38	3	●	●
3	6	50	3	●	●
4	8	50	4	●	●
5	12	50	6	●	●
6	12	50	6	●	●
8	16	60	8	●	●
10	20	72	10	●	●
12	24	75	12	●	●
16	32	100	16	●	●
20	40	100	20	●	●

※E106 : Uncoated For Aluminium
※E106 : 無塗層鋁合金專用刀

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	●	

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E107X 超微粒鎢鋼塗層倒角用立銑刀90°

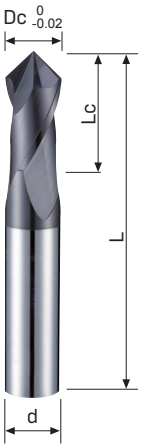
End Mills For Chamfering 90°

MG Carbide | AlTiN X-NaNo | 30° | 2 | N γ5° | 90°

Code No. E107X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E107	AlTiN E107X
0.5	1	38	3	——	●
0.6	1.2	38	3	——	●
0.8	1.6	38	3	——	●
1	2	38	3	●	●
1.2	2.4	38	3	——	●
1.5	3	38	3	——	●
1.8	3.6	38	3	——	●
2	4	38	3	●	●
2.5	5	38	3	——	●
3	6	50	3	●	●
4	8	50	4	●	●
5	12	50	6	●	●
6	12	50	6	●	●
8	16	60	8	●	●
10	20	72	10	●	●
12	24	75	12	●	●
16	32	100	16	●	●
20	40	100	20	●	●

※E107 : Uncoated For Aluminium
※E107 : 無塗層鋁合金專用刀



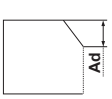
E106X / E107X 切削條件參考表

Recommended Milling Conditions

E106X / Chamfering 倒角加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium	
切削速度 Vc m/min		40～70		40～70		40～70		30～50		30～50		30～50		40～70		100～200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E106X-1	1	17,500	1050	17,500	1050	17,500	1050	9,550	286	9,550	286	9,550	286	17,500	1050	31,830	2,864
E106X-2	2.0	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E106X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E106X-4	4.0	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E106X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E106X-6	6.0	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E106X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E106X-10	10.0	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E106X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E106X-16	16.0	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E106X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

E107X / Chamfering / V groove machining 倒角加工 / V槽加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.10 鋁 Aluminium	
切削速度 Vc m/min		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 48~50 Ø1.0~3.0 55~70 Ø3.1~20 90		Ø0.5~0.8 40 Ø1.0~3.0 45~65 Ø3.1~20 75		Ø0.5~0.8 40 Ø1.0~3.0 45~65 Ø3.1~20 75		Ø0.5~0.8 50 Ø1.0~3.0 60~95 Ø3.1~20 120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E107X-0.5	0.5	31,000	460	31,000	460	31,000	460	25,480	320	25,480	320	32,000	650
E107X-0.6	0.6	27,000	500	27,000	500	27,000	500	21,230	320	21,230	320	26,540	700
E107X-0.8	0.8	21,500	530	21,500	530	21,500	530	15,920	350	15,920	350	19,900	750
E107X-1.0	1	17,500	530	17,500	530	17,500	530	14,330	350	14,330	350	17,510	800
E107X-1.2	1.2	15,000	600	15,000	600	15,000	600	13,270	360	13,270	360	14,590	850
E107X-1.5	1.5	12,500	620	12,500	620	12,500	620	10,610	360	10,610	360	12,740	900
E107X-1.8	1.8	10,500	630	10,500	630	10,500	630	9,730	380	9,730	380	10,610	950
E107X-2.0	2	9,700	630	9,700	630	9,700	630	9,555	380	9,555	380	10,350	980
E107X-2.5	2.5	8,200	650	8,200	650	8,200	650	7,640	400	7,640	400	10,192	1,010
E107X-3.0	3	7,430	670	7,430	670	7,430	670	6,900	410	6,900	410	10,080	1,150
E107X-4.0	4	7,200	650	7,200	650	7,200	650	6,000	360	6,000	360	9,600	860
E107X-5.0	5	5,730	515	5,730	515	5,730	515	4,770	290	4,770	290	7,645	690
E107X-6.0	6	4,800	430	4,800	430	4,800	430	4,000	240	4,000	240	6,400	580
E107X-8.0	8	3,600	430	3,600	430	3,600	430	3,000	180	3,000	180	4,800	580
E107X-10.0	10	2,900	410	2,900	410	2,900	410	2,400	140	2,400	140	3,800	530
E107X-12.0	12	2,400	336	2,400	336	2,400	336	2,000	120	2,000	120	3,200	510
E107X-16.0	16	1,800	252	1,800	252	1,800	252	1,500	100	1,500	100	2,400	400
E107X-20.0	20	1,400	196	1,400	196	1,400	196	1,200	95	1,200	95	1,900	340
切入深度 (mm) 		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D		≤ 0.3 D	

※ Pls. set up the feed speed under the 50% of conditions we descripted as above when you do the processing of V groove.
※The standard of Ap(cutting depth) is 0.3d.

※V槽加工時，進給速度請以上述條件的50%以下使用。
※Ad(切入深度)以0.3d為基準。

E108X 極超微粒鎢鋼塗層倒角用立銑刀60°

End Mills For Chamfering 60°

UMG Carbide | AlTiN X-NaNo | 0° | 不等 4 | N γ5° | 60°

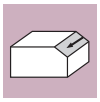
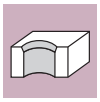
Code No. E108X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E108X
2	4	38	3	●
3	6	38	3	●
4	9	50	4	●
5	10	50	6	●
6	12	50	6	●
8	15	60	8	●
10	16	72	10	●
12	18	75	12	●
16	25	90	16	●
20	30	100	20	●

Steel < 52HRC

P	H	M	K	N	S
●	●	○	●	●	

Type of Operation

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

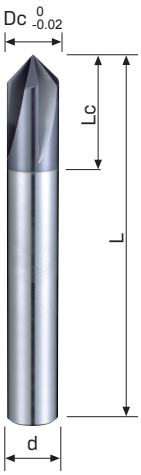
E109X 極超微粒鎢鋼塗層倒角用立銑刀90°

End Mills For Chamfering 90°

UMG Carbide | AlTiN X-NaNo | 0° | 不等 4 | N γ5° | 90°

Code No. E109X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E109X
2	4	38	3	●
3	6	38	3	●
4	9	50	4	●
5	10	50	6	●
6	12	50	6	●
8	15	60	8	●
10	16	72	10	●
12	18	75	12	●
16	25	90	16	●
20	30	100	20	●



E108X /E109X / Chamfering 倒角加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium	
切削速度 Vc m/min		40～70		40～70		40～70		30～50		30～50		30～50		40～70		100～200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E108X/E109X-2	2	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E108X/E109X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E108X/E109X-4	4	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E108X/E109X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E108X/E109X-6	6	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E108X/E109X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E108X/E109X-10	10	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E108X/E109X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E108X/E109X-16	16	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E108X/E109X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

E108X / V Groove Process V溝加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium	
切削速度 Vc m/min		40～70		40～70		40～70		20～50		20～50		20～50		40～70		100～200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E108X-2	2	11,670	700	11,670	700	11,670	700	4,774	143	4,774	143	4,774	143	11,670	700	15,915	1,432
E108X-3	3	8,753	525	8,753	525	8,753	525	3,183	100	3,183	100	3,183	100	8,753	525	10,610	954
E108X-4	4	7,000	420	7,000	420	7,000	420	3,183	100	3,183	100	3,183	100	7,000	420	9,550	955
E108X-5	5	5,729	343	5,729	343	5,729	343	2,546	100	2,546	100	2,546	100	5,729	343	7,639	763
E108X-6	6	4,774	286	4,774	286	4,774	286	2,122	90	2,122	90	2,122	90	4,774	286	6,366	700
E108X-8	8	3,580	358	3,580	358	3,580	358	1,989	120	1,989	120	1,989	120	3,580	358	5,570	668
E108X-10	10	2,864	286	2,864	286	2,864	286	1,591	95	1,591	95	1,591	95	2,864	286	4,456	712
E108X-12	12	2,387	238	2,387	238	2,387	238	1,591	127	1,591	127	1,591	127	2,387	238	3,978	716
E108X-16	16	1,790	116	1,790	116	1,790	116	1,193	119	1,193	119	1,193	119	1,790	116	2,984	537
E108X-20	20	1,432	186	1,432	186	1,432	186	954	95	954	95	954	95	1,432	186	2,387	477

※ Pls. set up the feed speed under the 50% of conditions we descripted as above when you do the processing of V groove.
※The standard of Ad(cutting depth) is 0.3d.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※V槽加工時，進給速度請以上述條件的50%以下使用。
※Ad(切入深度)以0.3d為基準。

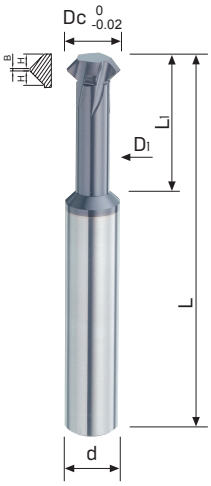
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E110HX / E120HX 超微粒鎢鋼塗層倒角用立銑刀 /90°

End Mills For Back and Front Chamfering / 90°

Code No. E110HX-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L_1 mm	D_1 mm	Z t	AlTiCrN E110HX
1	0.3	0.05	38	3	2.5	0.4	3	●
1.5	0.4	0.08	38	3	3.8	0.7	3	●
2	0.5	0.1	38	3	5	1	3	●
2.5	0.6	0.15	38	3	6.3	1.3	3	●
3	0.7	0.2	38	3	7.5	1.6	3	●
3.5	0.8	0.2	50	4	8.8	1.9	3	●
4	0.9	0.2	50	4	10	2.2	3	●
4.5	1.1	0.2	50	5	11.3	2.3	3	●
5	1.2	0.2	50	5	12.5	2.6	3	●
5.5	1.3	0.2	50	6	13.8	2.9	3	●
6	1.6	0.2	50	6	15	3.1	3	●
8	1.7	0.2	60	8	20	4.6	4	●
10	1.9	0.2	72	10	25	6.2	5	●
12	2.2	0.2	75	12	30	7.6	6	●



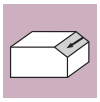
Steel < 48HRC

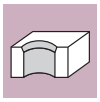
P	H	M	K	N	S
●	●	○	○	○	○

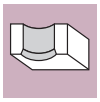
MG Carbide

AlTiCrN HX

Type of Operation

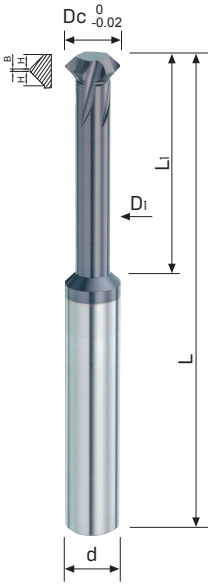






Code No. E120HX-Dc

Dc 0 -0.02	H mm	B mm	L mm	d h6	L_1 mm	D_1 mm	Z t	AlTiCrN E120HX
3	0.7	0.2	50	3	12	1.6	3	●
3.5	0.8	0.2	50	4	14	1.9	3	●
4	0.9	0.2	50	4	16	2.2	3	●
4.5	1.1	0.2	50	5	18	2.3	3	●
5	1.2	0.2	50	5	20	2.6	3	●
5.5	1.3	0.2	60	6	22	2.9	3	●
6	1.6	0.2	60	6	24	3.1	3	●
8	1.7	0.2	70	8	32	4.6	4	●
10	1.9	0.2	80	10	40	6.2	5	●
12	2.2	0.2	90	12	48	7.6	6	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	○

E110HX / E120HX 切削條件參考表

Recommended Milling Conditions

E110HX / Chamfering 倒角加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium		GR.10 鋁 Aluminium		GR.10 鋁 Aluminium	
切削速度 Vc m/min		30～60		25～70		15～40		25～50		30～80		15～30		25～80		100～200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E110HX-1	1	14,323	2,148	14,323	2,148	7,957	477	11,140	835	14,323	2,148	4,774	286	14,323	2,148	31,830	4,700
E110HX-1.5	1.5	9,549	1,430	9,549	1,430	5300	318	7,427	557	9,549	1,430	3,183	190	9,549	1,430	21,220	3,183
E110HX-2.0	2	7,161	1,280	7,161	1,280	3978	238	5,570	417	7,161	1,280	2,387	143	7,161	1,280	15,915	2,387
E110HX-2.5	2.5	5,729	1,030	5,729	1,030	3183	238	4,456	400	5,729	1,030	1,909	114	5,729	1,030	12,732	1,900
E110HX-3	3	4,774	1,000	4,774	1,000	2652	198	3,713	334	4,774	1,000	1,591	100	4,774	1,000	10,610	1,591
E110HX-3.5	3.5	4,547	818	4,547	818	2728	204	3,637	381	4,547	818	1,818	136	4,547	818	9,094	1,364
E110HX-4	4	3,978	835	3,978	835	2387	214	3,183	334	3,978	835	1,591	119	3,978	835	9,549	1,432
E110HX-4.5	4.5	3,536	742	3,536	742	2122	190	2,828	296	3,536	742	1,414	127	3,536	742	8,848	1,327
E110HX-5	5	3,183	763	3,183	763	1910	200	2,546	305	3,183	763	1,273	114	3,183	763	7,639	1,145
E110HX-5.5	5.5	3,100	651	3,100	651	1736	182	2,314	277	3,100	651	1,157	121	3,100	651	6,944	1,041
E110HX-6	6	2,917	612	2,917	612	1856	194	2,387	286	2,917	612	1,061	111	2,917	612	6,366	954
E110HX-8	8	2,188	612	2,188	612	1392	194	1,790	286	2,188	612	994	159	2,188	612	5,570	1,114
E110HX-10	10	1,750	612	1,750	612	1114	222	1,432	286	1,750	612	795	159	1,750	612	4,456	1,114
E110HX-12	12	1,591	668	1,591	668	928	250	1,193	286	1,591	668	663	159	1,591	668	3,713	1,114

E120HX / Chamfering 倒角加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium		GR.10 鋁 Aluminium		GR.10 鋁 Aluminium	
切削速度 Vc m/min		30～60		25～70		15～40		25～50		30～80		15～30		25～80		100～200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E120HX-3	3	4,774	1,000	4,774	1,000	2,652	198	3,713	334	4,774	1,000	1,591	100	4,774	1,000	10,610	1,591
E120HX-3.5	3.5	4,547	818	4,547	818	2,728	204	3,637	381	4,547	818	1,818	136	4,547	818	9,094	1,364
E120HX-4	4	3,978	835	3,978	835	2,387	214	3,183	334	3,978	835	1,591	119	3,978	835	9,549	1,432
E120HX-4.5	4.5	3,536	742	3,536	742	2,122	190	2,828	296	3,536	742	1,414	127	3,536	742	8,848	1,327
E120HX-5	5	3,183	763	3,183	763	1,910	200	2,546	305	3,183	763	1,273	114	3,183	763	7,639	1,145
E120HX-5.5	5.5	3,100	651	3,100	651	1,736	182	2,314	277	3,100	651	1,157	121	3,100	651	6,944	1,041
E120HX-6	6	2,917	612	2,917	612	1,856	194	2,387	286	2,917	612	1,061	111	2,917	612	6,366	954
E120HX-8	8	2,188	612	2,188	612	1,392	194	1,790	286	2,188	612	994	159	2,188	612	5,570	1,114
E120HX-10	10	1,750	612	1,750	612	1,114	222	1,432	286	1,750	612	795	159	1,750	612	4,456	1,114
E120HX-12	12	1,591	668	1,591	668	928	250	1,193	286	1,591	668	663	159	1,591	668	3,713	1,114

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

深溝立銑刀
End Mills For Rib Processing

Page	69	71	73	75	77	79
Apperance						
Code No	F692TX	F694TX	F690TX	F690TX	F693TX	F695TX
Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide	SMG Carbide
Coating	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
Helix Angle	30°	30°	30°	30°	30°	30°
No.of Flutes	2	4	2	2	4	2

7leaders®
The Art of Cutting

81

F691TX

SMG Carbide

AlTiSiN TX

30°

2

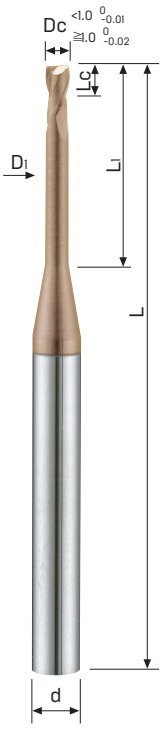
F692TX 極超微粒鎢鋼塗層深溝立銑刀

End Mills For Rib Processing

Code No. F692TX-Dc×L1

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692TX
0.2	0.5	0.3	50	4	0.17	●
0.2	1	0.3	50	4	0.17	●
0.2	2	0.3	50	4	0.17	●
0.2	3	0.3	50	4	0.17	●
0.3	1	0.45	50	4	0.27	●
0.3	1.5	0.45	50	4	0.27	●
0.3	2	0.45	50	4	0.27	●
0.3	3	0.45	50	4	0.27	●
0.3	4	0.45	50	4	0.27	●
0.4	1	0.6	50	4	0.37	●
0.4	1.5	0.6	50	4	0.37	●
0.4	2	0.6	50	4	0.37	●
0.4	3	0.6	50	4	0.37	●
0.4	4	0.6	50	4	0.37	●
0.4	5	0.6	50	4	0.37	●
0.4	6	0.6	50	4	0.37	●
0.4	8	0.6	50	4	0.37	●
0.5	1	0.7	50	4	0.45	●
0.5	2	0.7	50	4	0.45	●
0.5	3	0.7	50	4	0.45	●
0.5	4	0.7	50	4	0.45	●
0.5	6	0.7	50	4	0.45	●
0.5	8	0.7	50	4	0.45	●
0.5	10	0.7	50	4	0.45	●
0.6	2	0.9	50	4	0.55	●
0.6	3	0.9	50	4	0.55	●
0.6	4	0.9	50	4	0.55	●
0.6	6	0.9	50	4	0.55	●
0.6	8	0.9	50	4	0.55	●
0.6	10	0.9	50	4	0.55	●
0.7	2	1	50	4	0.65	●
0.7	4	1	50	4	0.65	●
0.7	6	1	50	4	0.65	●
0.7	8	1	50	4	0.65	●
0.8	2	1.2	50	4	0.75	●
0.8	4	1.2	50	4	0.75	●
0.8	6	1.2	50	4	0.75	●
0.8	8	1.2	50	4	0.75	●
0.8	10	1.2	50	4	0.75	●
0.8	12	1.2	50	4	0.75	●
0.9	4	1.4	50	4	0.85	●
0.9	6	1.4	50	4	0.85	●
0.9	8	1.4	50	4	0.85	●
0.9	10	1.4	50	4	0.85	●
1	2	1.5	50	4	0.95	●
1	3	1.5	50	4	0.95	●
1	4	1.5	50	4	0.95	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1	14	1.5	50	4	0.95	●
1	16	1.5	50	4	0.95	●
1	18	1.5	60	4	0.95	●
1	20	1.5	60	4	0.95	●
1.2	6	1.8	50	4	1.15	●
1.2	8	1.8	50	4	1.15	●
1.2	10	1.8	50	4	1.15	●
1.2	12	1.8	50	4	1.15	●
1.2	14	1.8	50	4	1.15	●
1.2	16	1.8	50	4	1.15	●
1.4	6	2.1	50	4	1.35	●
1.4	8	2.1	50	4	1.35	●
1.4	10	2.1	50	4	1.35	●
1.4	12	2.1	50	4	1.35	●
1.4	14	2.1	50	4	1.35	●
1.4	16	2.1	50	4	1.35	●
1.5	4	2.3	50	4	1.45	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F692TX
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	14	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
1.5	18	2.3	60	4	1.45	●
1.5	20	2.3	60	4	1.45	●
1.5	25	2.3	65	4	1.45	●
1.5	30	2.3	70	4	1.45	●
1.6	6	2.4	50	4	1.55	●
1.6	8	2.4	50	4	1.55	●
1.6	10	2.4	50	4	1.55	●
1.6	12	2.4	50	4	1.55	●
1.6	14	2.4	50	4	1.55	●
1.6	16	2.4	50	4	1.55	●
1.6	18	2.4	60	4	1.55	●
1.6	20	2.4	60	4	1.55	●
1.8	6	2.7	50	4	1.75	●
1.8	8	2.7	50	4	1.75	●
1.8	10	2.7	50	4	1.75	●
1.8	12	2.7	50	4	1.75	●
1.8	14	2.7	50	4	1.75	●
1.8	16	2.7	50	4	1.75	●
1.8	18	2.7	60	4	1.75	●
1.8	20	2.7	60	4	1.75	●
2	4	3	50	4	1.95	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	14	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	18	3	60	4	1.95	●
2	20	3	60	4	1.95	●
2	25	3	60	4	1.95	●
2	30	3	70	4	1.95	●
2	35	3	75	4	1.95	●
2	40	3	80	4	1.95	●
2.5	8	3.7	50	4	2.4	●
2.5	10	3.7	50	4	2.4	●
2.5	12	3.7	50	4	2.4	●
2.5	14	3.7	50	4	2.4	●
2.5	16	3.7	60	4	2.4	●
2.5	18	3.7	60	4	2.4	●
2.5	20	3.7	60	4	2.4	●
2.5	25	3.7	70	4	2.4	●
2.5	30	3.7	70	4	2.4	●
2.5	40	3.7	80	4	2.4	●
3	8	4.5	50	6	2.85	●
3	10	4.5	50	6	2.85	●
3	12	4.5	50	6	2.85	●
3	14	4.5	60	6	2.85	●
3	16	4.5	60	6	2.85	●
3	18	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●
3	30	4.5	70	6	2.85	●
3	35	4.5	80	6	2.85	●
3	40	4.5	90	6	2.85	●
3	50	4.5	100	6	2.85	●
4	12	6	60	6	3.85	●
4	16	6	60	6	3.85	●
4	20	6	70	6	3.85	●
4	25	6	70	6	3.85	●
4	30	6	80	6	3.85	●
4	35	6	80	6	3.85	●
4	40	6	90	6	3.85	●
4	45	6	100	6	3.85	●
4	50	6	100	6	3.85	●



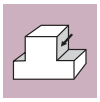
Steel < 62HRC

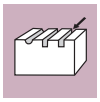
P	H	M	K	N	S
●	●		○	○	

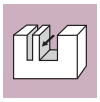
SMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

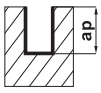
F692TX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 / GR.2 低合金鋼 / GR.3 高合金鋼 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (~24HRC) (~30HRC)			GR.4 硬化鋼 / GR.5 硬化鋼 Hardened Steel / Hardened Steel (30~38HRC) (38~48HRC)			GR.6 硬化鋼 Hardened Steel (48~56HRC)			GR.7 硬化鋼 Hardened Steel (56~68HRC)		
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)
F692TX	0.2×0.5	50,000	320	0.009	50,000	170	0.006	50,000	150	0.004	50,000	10	0.003
F692TX	0.2×1	50,000	320	0.008	50,000	150	0.005	50,000	150	0.004	50,000	10	0.003
F692TX	0.2×2	50,000	290	0.006	50,000	130	0.004	50,000	120	0.003	50,000	10	0.002
F692TX	0.2×3	50,000	280	0.002	50,000	100	0.001	50,000	100	0.001	50,000	10	0.001
F692TX	0.3×1	48,000	448	0.009	48,000	352	0.006	41,680	264	0.004	14,600	14	0.003
F692TX	0.3×1.5	40,640	368	0.008	40,640	288	0.005	34,160	208	0.004	14,600	13	0.003
F692TX	0.3×2	33,200	280	0.006	33,200	224	0.004	26,560	152	0.003	14,600	12	0.002
F692TX	0.3×3	25,520	192	0.002	25,520	152	0.001	20,400	104	0.001	14,600	10	0.001
F692TX	0.3×4	20,960	136	0.001	20,960	112	0.001	16,720	80	0.001	14,600	9	0.001
F692TX	0.4×1	42,160	528	0.011	38,480	376	0.007	30,800	256	0.004	14,300	17	0.003
F692TX	0.4×1.5	42,160	528	0.011	38,480	376	0.007	30,800	256	0.004	14,300	17	0.003
F692TX	0.4×2	40,000	488	0.009	35,680	344	0.006	28,560	232	0.004	14,600	17	0.003
F692TX	0.4×3	35,600	408	0.005	30,000	272	0.004	24,000	184	0.003	14,300	16	0.002
F692TX	0.4×4	32,800	352	0.004	26,480	224	0.003	21,200	152	0.002	14,300	15	0.001
F692TX	0.4×5	30,800	304	0.003	24,080	192	0.002	19,280	128	0.001	14,300	14	0.001
F692TX	0.4×6	30,800	280	0.002	24,000	180	0.001	18,000	100	0.001	14,000	10	0.001
F692TX	0.4×8	30,800	250	0.002	24,000	160	0.001	17,000	80	0.001	14,000	10	0.001
F692TX	0.5×1	45,440	720	0.015	32,480	408	0.011	26,000	280	0.008	14,000	20	0.004
F692TX	0.5×2	45,440	720	0.015	32,480	408	0.011	26,000	280	0.008	14,000	20	0.004
F692TX	0.5×3	35,360	528	0.007	25,760	296	0.007	20,560	208	0.005	14,000	19	0.004
F692TX	0.5×4	32,480	464	0.008	23,760	264	0.006	18,960	184	0.004	14,000	18	0.003
F692TX	0.5×6	26,720	336	0.004	19,760	200	0.003	15,760	136	0.002	14,000	16	0.001
F692TX	0.5×8	23,280	256	0.002	17,280	152	0.001	13,840	104	0.001	14,000	14	0.001
F692TX	0.5×10	20,880	200	0.001	15,680	120	0.001	12,480	80	0.001	14,000	12	0.001
F692TX	0.6×2/0.6×3/0.6×4	50,880	992	0.023	31,280	480	0.016	25,040	328	0.011	12,000	23	0.006
F692TX	0.6×6	25,680	416	0.007	18,400	232	0.005	14,720	160	0.003	12,000	19	0.002
F692TX	0.6×8	21,440	312	0.004	16,000	184	0.003	12,800	128	0.002	12,000	17	0.001
F692TX	0.6×10	18,720	240	0.002	14,320	144	0.002	11,440	104	0.001	12,000	15	0.001
F692TX	0.8×4/0.8×6	29,680	744	0.027	19,280	384	0.019	15,440	264	0.013	8,000	20	0.01
F692TX	0.8×8	19,280	416	0.009	13,760	240	0.006	11,040	160	0.004	8,000	16	0.003
F692TX	0.8×10	16,800	336	0.006	13,760	240	0.006	11,040	160	0.004	8,000	14	0.002
F692TX	0.8×12	14,960	272	0.004	11,280	160	0.003	9,040	112	0.002	8,000	12	0.001
F692TX	1×2 / 1×3 / 1×4	27,280	936	0.04	17,200	464	0.028	13,760	320	0.02	6,500	15	0.01
F692TX	1×6	21,200	680	0.023	14,080	352	0.016	11,280	248	0.012	6,500	14	0.006
F692TX	1×10	15,360	424	0.01	11,040	240	0.007	8,800	168	0.005	6,500	12	0.003
F692TX	1×12	13,760	352	0.007	10,080	200	0.005	8,080	136	0.003	6,500	11	0.002
F692TX	1×16	11,440	240	0.004	8,800	144	0.003	7,040	104	0.002	6,500	10	0.001
F692TX	1×20	10,000	160	0.003	8,800	144	0.003	7,040	104	0.002	6,500	10	0.001
F692TX	1.5×4/1.5×6/1.5×8	18,240	896	0.057	11,520	440	0.04	9,200	304	0.028	9,600	60	0.016
F692TX	1.5×10	13,280	600	0.03	8,960	312	0.021	7,120	216	0.015	9,600	13	0.009
F692TX	1.5×16	10,300	400	0.016	7,300	210	0.011	5,800	150	0.008	9,600	1	0.003
F692TX	1.5×20	9,500	330	0.011	6,600	170	0.007	5,200	130	0.005	9,600	10	0.003
F692TX	1.5×25	9,200	320	0.009	6,400	160	0.008	4,900	120	0.008	9,600	10	0.002
F692TX	1.5×30	9,000	300	0.007	6,200	140	0.006	4,600	110	0.006	9,600	10	0.001
F692TX	2×4 / 2×6 / 2×8	7,500	300	0.064	5,200	150	0.045	4,000	100	0.032	9,600	230	0.019
F692TX	2×10	11,840	736	0.045	7,760	376	0.031	6,240	264	0.022	9,600	45	0.013
F692TX	2×14	9,600	560	0.031	6,560	296	0.022	5,280	208	0.016	9,600	16	0.009
F692TX	2×20	7,680	400	0.018	5,520	224	0.013	4,400	152	0.009	9,600	11	0.002
F692TX	2×30	6,000	248	0.008	4,480	144	0.005	3,600	104	0.004	9,600	11	0.001
F692TX	2×40	5,000	200	0.003	3,800	90	0.001	3,000	40	0.001	9,600	10	0.001
F692TX	2.5×8/2.5×10/2.5×12	12,000	1,072	0.077	7,680	536	0.054	6,160	368	0.039	9,600	227	0.023
F692TX	2.5×14	8,560	704	0.052	5,840	376	0.036	4,640	256	0.026	9,600	42	0.015
F692TX	2.5×20	6,960	520	0.033	4,880	288	0.023	3,920	200	0.017	9,600	14	0.01
F692TX	2.5×25	6,080	416	0.022	4,400	240	0.015	3,520	168	0.011	9,600	10	0.008
F692TX	2.5×30	5,440	344	0.014	4,000	200	0.01	3,200	136	0.007	9,600	10	0.005
F692TX	2.5×40	5,300	300	0.01	3,500	160	0.006	2,800	100	0.004	9,600	10	0.003
F692TX	3×8 / 3×10 / 3×12	10,560	1,176	0.103	6,400	560	0.072	5,120	384	0.052	8,000	435	0.031
F692TX	3×14	7,680	800	0.072	4,960	408	0.051	4,000	280	0.036	8,000	81	0.021
F692TX	3×20	6,240	600	0.05	4,240	320	0.035	3,440	224	0.025	8,000	27	0.015
F692TX	3×30	4,960	416	0.026	3,600	232	0.018	2,880	160	0.013	8,000	10	0.007
F692TX	3×40	4,400	340	0.013	3,100	180	0.009	2,400	110	0.005	8,000	10	0.003
F692TX	3×50	4,200	320	0.009	2,900	160	0.005	2,200	90	0.003	8,000	10	0.001
F692TX	4×12 / 4×16 / 4×20	6,800	1,024	0.112	4,080	480	0.078	3,280	328	0.056	6,000	388	0.033
F692TX	4×30	4,000	504	0.048	2,640	264	0.033	2,080	184	0.024	6,000	24	0.014
F692TX	4×40	3,360	376	0.03	2,320	200	0.021	1,840	144	0.015	6,000	10	0.009
F692TX	4×50	2,960	288	0.018	2,080	160	0.013	1,680	112	0.009	6,000	10	0.001

切入深度 (mm)

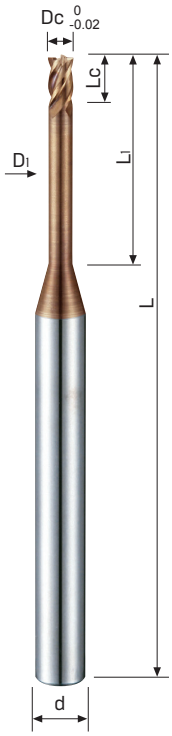


F694TX 極超微粒鎢鋼塗層深溝立銑刀

End Mills For Rib Processing

Code No. F694TX-Dc×L1

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F694TX
1	3	1.5	50	4	0.95	●
1	4	1.5	50	4	0.95	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1.5	4	2.3	50	4	1.45	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	20	3	60	4	1.95	●
2	25	3	60	4	1.95	●
2	30	3	70	4	1.95	●
3	8	4.5	50	6	2.85	●
3	10	4.5	50	6	2.85	●
3	12	4.5	50	6	2.85	●
3	16	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●
3	30	4.5	70	6	2.85	●
4	12	6	60	6	3.85	●
4	16	6	60	6	3.85	●
4	20	6	70	6	3.85	●
4	25	6	70	6	3.85	●
4	30	6	80	6	3.85	●
4	40	6	90	6	3.85	●
5	16	7.5	60	6	4.85	●
5	20	7.5	70	6	4.85	●
5	30	7.5	80	6	4.85	●
5	40	7.5	90	6	4.85	●
6	20	9	70	6	5.85	●
6	30	9	80	6	5.85	●
6	40	9	90	6	5.85	●
6	50	9	100	6	5.85	●



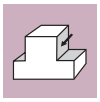
Steel < 70HRC

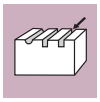
P	H	M	K	N	S
●	●		○	○	

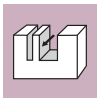
SMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)				GR.6 硬化鋼 Hardened Steel (48~56HRC)				GR.7 硬化鋼 Hardened Steel (56~68HRC)			
型號 Code No.	刃徑 × 頸長 Dc×L1	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)
F694TX	1×3	14,000	1,350	0.04	0.3	13,000	1,100	0.035	0.25	8,800	700	0.02	0.25
F694TX	1×4	13,800	1,310	0.039	0.270	12,000	1,070	0.031	0.243	8,500	640	0.015	0.243
F694TX	1×6	11,300	1,040	0.021	0.216	9,800	860	0.016	0.209	7,000	510	0.01	0.108
F694TX	1×8	9,800	780	0.02	0.189	8,500	720	0.012	0.16	6,100	420	0.008	0.094
F694TX	1×10	8,800	510	0.011	0.126	7,600	510	0.009	0.1	5,400	350	0.006	0.05
F694TX	1×12	8,300	490	0.01	0.1	7,200	490	0.005	0.1	5,000	300	0.003	0.05
F694TX	1.5×4	12,000	1,300	0.045	0.5	12,000	1,250	0.045	0.5	9,000	500	0.03	0.25
F694TX	1.5×6	11,600	1,280	0.041	0.486	10,600	1,210	0.038	0.445	8,100	460	0.025	0.202
F694TX	1.5×8	10,200	1,080	0.038	0.35	9,300	1,020	0.031	0.346	7,100	390	0.015	0.157
F694TX	1.5×10	9,000	900	0.03	0.3	8,200	800	0.03	0.3	6,500	360	0.01	0.1
F694TX	1.5×12	8,500	830	0.029	0.324	7,800	780	0.026	0.297	5,900	300	0.01	0.162
F694TX	1.5×16	7,400	670	0.018	0.216	6,800	600	0.014	0.198	5,100	230	0.005	0.108
F694TX	2×6	12,800	1,280	0.064	0.648	12,000	1,200	0.06	0.729	9,700	700	0.028	0.324
F694TX	2×8	11,200	1,160	0.058	0.612	10,400	1,100	0.055	0.648	8,400	600	0.026	0.288
F694TX	2×10	10,000	1,100	0.045	0.5	9,000	1,000	0.045	0.5	8,200	500	0.02	0.25
F694TX	2×12	9,100	1,030	0.046	0.405	8,500	960	0.044	0.405	6,900	420	0.018	0.180
F694TX	2×16	7,800	860	0.042	0.283	7,300	700	0.039	0.315	5,900	270	0.016	0.157
F694TX	2×20	7,000	800	0.025	0.198	6,600	650	0.024	0.198	5,300	290	0.007	0.116
F694TX	2×25	6,500	650	0.02	0.15	6,500	600	0.02	0.15	5,000	200	0.005	0.08
F694TX	2×30	6,000	500	0.02	0.1	6,000	450	0.02	0.1	4,500	150	0.003	0.05
F694TX	3×8	11,250	2,300	0.1	0.65	11,000	2,000	0.08	0.65	9,000	750	0.05	0.5
F694TX	3×10	11,250	2,277	0.0945	0.63	10,620	1,980	0.063	0.63	8,910	729	0.0423	0.45
F694TX	3×12	10,500	2,020	0.084	0.670	10,000	1,950	0.052	0.67	8,100	660	0.037	0.5
F694TX	3×16	9,200	1,680	0.064	0.634	8,800	1,600	0.04	0.63	7,100	570	0.027	0.378
F694TX	3×20	8,400	1,540	0.058	0.580	7,900	1,490	0.036	0.58	6,300	550	0.022	0.319
F694TX	3×25	7,500	1,350	0.05	0.4	7,000	1,100	0.025	0.4	6,000	450	0.01	0.2
F694TX	3×30	7,000	1,260	0.04	0.38	6,500	1,230	0.015	0.38	5,400	390	0.007	0.144
F694TX	4×12	8,500	1,400	0.1	1.0	7,100	1,350	0.078	1.08	6,000	760	0.051	0.76
F694TX	4×16	7,900	1,370	0.091	1.0	6,600	1,330	0.071	1.0	5,600	740	0.043	0.7
F694TX	4×20	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F694TX	4×25	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F694TX	4×30	5,500	960	0.037	0.648	4,600	920	0.029	0.648	3,900	600	0.011	0.388
F694TX	4×40	5,000	800	0.03	0.5	4,300	800	0.025	0.5	3,500	500	0.005	0.3
F694TX	5×16	8,000	1,100	0.15	1.0	8,000	1,100	0.15	1.0	5,500	700	0.05	0.6
F694TX	5×20	7,500	900	0.1	1.0	7,500	900	0.1	1.0	5,200	680	0.03	0.5
F694TX	5×30	6,500	700	0.08	0.5	6,500	700	0.08	0.5	4,800	630	0.02	0.3
F694TX	5×40	5,500	600	0.05	0.3	5,500	600	0.05	0.3	4,500	600	0.01	0.2
F694TX	6×20	7,000	1,000	0.3	1.2	7,000	1,000	0.3	1.2	5,000	650	0.05	0.6
F694TX	6×30	6,500	800	0.2	1.0	6,500	800	0.2	1.0	4,700	620	0.03	0.5
F694TX	6×40	6,000	700	0.15	0.8	6,000	700	0.15	0.8	4,400	580	0.02	0.3
F694TX	6×50	5,500	600	0.1	0.6	5,500	600	0.1	0.6	4,100	550	0.01	0.2

切入深度 (mm)

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

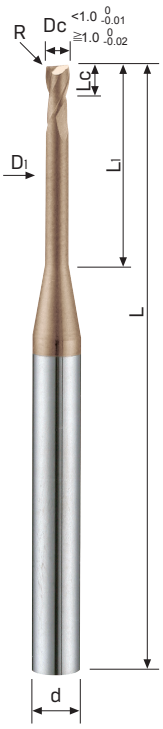
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F690TX 極超微粒鎢鋼塗層深溝環面R角立銑刀

Toric End Mills For Rib Processing With Corner Radius

Code No. F690TX-Dc×R×L1

Dc 0/-0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F690TX
0.2	R0.02	0.5	0.15	50	4	0.18	●
0.2	R0.02	1	0.15	50	4	0.18	●
0.2	R0.02	2	0.15	50	4	0.18	●
0.2	R0.05	0.5	0.15	50	4	0.18	●
0.2	R0.05	1	0.15	50	4	0.18	●
0.2	R0.05	2	0.15	50	4	0.18	●
0.3	R0.02	1	0.25	50	4	0.28	●
0.3	R0.02	2	0.25	50	4	0.28	●
0.3	R0.02	3	0.25	50	4	0.28	●
0.3	R0.05	1	0.25	50	4	0.28	●
0.3	R0.05	2	0.25	50	4	0.28	●
0.3	R0.05	3	0.25	50	4	0.28	●
0.4	R0.02	1	0.3	50	4	0.37	●
0.4	R0.02	2	0.3	50	4	0.37	●
0.4	R0.02	3	0.3	50	4	0.37	●
0.4	R0.02	4	0.3	50	4	0.37	●
0.4	R0.05	1	0.3	50	4	0.37	●
0.4	R0.05	2	0.3	50	4	0.37	●
0.4	R0.05	3	0.3	50	4	0.37	●
0.4	R0.05	4	0.3	50	4	0.37	●
0.4	R0.1	1	0.3	50	4	0.37	●
0.4	R0.1	2	0.3	50	4	0.37	●
0.4	R0.1	3	0.3	50	4	0.37	●
0.4	R0.1	4	0.3	50	4	0.37	●
0.5	R0.02	1	0.4	50	4	0.46	●
0.5	R0.02	2	0.4	50	4	0.46	●
0.5	R0.02	3	0.4	50	4	0.46	●
0.5	R0.02	4	0.4	50	4	0.46	●
0.5	R0.02	5	0.4	50	4	0.46	●
0.5	R0.02	6	0.4	50	4	0.46	●
0.5	R0.05	1	0.4	50	4	0.46	●
0.5	R0.05	2	0.4	50	4	0.46	●
0.5	R0.05	3	0.4	50	4	0.46	●
0.5	R0.05	4	0.4	50	4	0.46	●
0.5	R0.05	5	0.4	50	4	0.46	●
0.5	R0.05	6	0.4	50	4	0.46	●
0.5	R0.1	1	0.4	50	4	0.46	●
0.5	R0.1	2	0.4	50	4	0.46	●
0.5	R0.1	3	0.4	50	4	0.46	●
0.5	R0.1	4	0.4	50	4	0.46	●
0.5	R0.1	5	0.4	50	4	0.46	●
0.5	R0.1	6	0.4	50	4	0.46	●
0.6	R0.02	2	0.5	50	4	0.55	●
0.6	R0.02	4	0.5	50	4	0.55	●
0.6	R0.02	6	0.5	50	4	0.55	●
0.6	R0.02	8	0.5	50	4	0.55	●
0.6	R0.05	2	0.5	50	4	0.55	●
0.6	R0.05	4	0.5	50	4	0.55	●
0.6	R0.05	6	0.5	50	4	0.55	●
0.6	R0.05	8	0.5	50	4	0.55	●
0.6	R0.1	2	0.5	50	4	0.55	●
0.6	R0.1	4	0.5	50	4	0.55	●
0.6	R0.1	6	0.5	50	4	0.55	●
0.6	R0.1	8	0.5	50	4	0.55	●
0.8	R0.02	2	0.65	50	4	0.75	●
0.8	R0.02	4	0.65	50	4	0.75	●
0.8	R0.02	6	0.65	50	4	0.75	●
0.8	R0.02	8	0.65	50	4	0.75	●
0.8	R0.02	12	0.65	50	4	0.75	●
0.8	R0.05	2	0.65	50	4	0.75	●
0.8	R0.05	4	0.65	50	4	0.75	●
0.8	R0.05	6	0.65	50	4	0.75	●
0.8	R0.05	8	0.65	50	4	0.75	●
0.8	R0.05	12	0.65	50	4	0.75	●
0.8	R0.1	2	0.65	50	4	0.75	●
0.8	R0.1	4	0.65	50	4	0.75	●
0.8	R0.1	6	0.65	50	4	0.75	●
0.8	R0.1	8	0.65	50	4	0.75	●
0.8	R0.1	12	0.65	50	4	0.75	●
0.8	R0.2	2	0.65	50	4	0.75	●
0.8	R0.2	4	0.65	50	4	0.75	●
0.8	R0.2	6	0.65	50	4	0.75	●
0.8	R0.2	8	0.65	50	4	0.75	●
0.8	R0.2	12	0.65	50	4	0.75	●
1	R0.02	2	0.8	50	4	0.95	●
1	R0.02	4	0.8	50	4	0.95	●
1	R0.02	6	0.8	50	4	0.95	●
1	R0.02	8	0.8	50	4	0.95	●
1	R0.02	10	0.8	50	4	0.95	●
1	R0.02	12	0.8	50	4	0.95	●
1	R0.05	2	0.8	50	4	0.95	●
1	R0.05	4	0.8	50	4	0.95	●
1	R0.05	6	0.8	50	4	0.95	●
1	R0.05	8	0.8	50	4	0.95	●
1	R0.05	10	0.8	50	4	0.95	●
1	R0.05	12	0.8	50	4	0.95	●
1	R0.1	2	0.8	50	4	0.95	●
1	R0.1	4	0.8	50	4	0.95	●
1	R0.1	6	0.8	50	4	0.95	●
1	R0.1	8	0.8	50	4	0.95	●
1	R0.1	10	0.8	50	4	0.95	●
1	R0.1	12	0.8	50	4	0.95	●
1	R0.2	2	0.8	50	4	0.95	●
1	R0.2	4	0.8	50	4	0.95	●
1	R0.2	6	0.8	50	4	0.95	●
1	R0.2	8	0.8	50	4	0.95	●
1	R0.2	10	0.8	50	4	0.95	●
1	R0.2	12	0.8	50	4	0.95	●
1	R0.3	2	0.8	50	4	0.95	●
1	R0.3	4	0.8	50	4	0.95	●
1	R0.3	6	0.8	50	4	0.95	●
1	R0.3	8	0.8	50	4	0.95	●
1	R0.3	10	0.8	50	4	0.95	●
1	R0.3	12	0.8	50	4	0.95	●
1.2	R0.2	6	1	50	4	1.15	●
1.2	R0.2	8	1	50	4	1.15	●
1.2	R0.2	10	1	50	4	1.15	●
1.5	R0.1	4	1.2	50	4	1.45	●
1.5	R0.1	6	1.2	50	4	1.45	●
1.5	R0.1	8	1.2	50	4	1.45	●
1.5	R0.1	10	1.2	50	4	1.45	●
1.5	R0.1	12	1.2	50	4	1.45	●
1.5	R0.1	16	1.2	50	4	1.45	●
1.5	R0.2	4	1.2	50	4	1.45	●
1.5	R0.2	6	1.2	50	4	1.45	●
1.5	R0.2	8	1.2	50	4	1.45	●
1.5	R0.2	10	1.2	50	4	1.45	●
1.5	R0.2	12	1.2	50	4	1.45	●
1.5	R0.2	16	1.2	50	4	1.45	●
1.5	R0.3	4	1.2	50	4	1.45	●
1.5	R0.3	6	1.2	50	4	1.45	●
1.5	R0.3	8	1.2	50	4	1.45	●
1.5	R0.3	10	1.2	50	4	1.45	●
1.5	R0.3	12	1.2	50	4	1.45	●
1.5	R0.3	16	1.2	50	4	1.45	●
2	R0.1	4	1.6	50	4	1.95	●
2	R0.1	6	1.6	50	4	1.95	●
2	R0.1	8	1.6	50	4	1.95	●
2	R0.1	10	1.6	50	4	1.95	●
2	R0.1	12	1.6	50	4	1.95	●
2	R0.1	16	1.6	50	4	1.95	●
2	R0.1	20	1.6	60	4	1.95	●
2	R0.2	4	1.6	50	4	1.95	●
2	R0.2	6	1.6	50	4	1.95	●
2	R0.2	8	1.6	50	4	1.95	●
2	R0.2	10	1.6	50	4	1.95	●
2	R0.2	12	1.6	50	4	1.95	●
2	R0.2	16	1.6	50	4	1.95	●
2	R0.2	20	1.6	60	4	1.95	●
2	R0.3	4	1.6	50	4	1.95	●



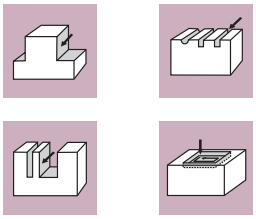
Steel < 70HRC

P	H	M	K	N	S
●	●		○	○	

SMG Carbide

AlTiSiN TX

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F690TX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 / GR.2 低合金鋼 / GR.3 高合金鋼 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (-24HRC) (-30HRC)				GR.4 硬化鋼 / GR.5 硬化鋼 Hardened Steel/ Hardened Steel (38~48HRC) (30~38HRC)				GR.6 硬化鋼 Hardened Steel (48~56HRC)				GR.7 硬化鋼 Hardened Steel (56~68HRC)			
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)
F690TX	0.2×0.5	38,500	550	0.01	0.05	35000	500	0.01	0.05	31500	400	0.01	0.05	47775	30	0.01	0.05
F690TX	0.2×1	38,115	528	0.008	0.03	34650	480	0.008	0.03	31185	384	0.008	0.03	39812.5	20	0.008	0.03
F690TX	0.2×2	37,026	495	0.005	0.02	33660	450	0.005	0.02	30294	360	0.005	0.02	31850	10	0.005	0.02
F690TX	0.3×1	37,785	638	0.015	0.07	34350	580	0.015	0.07	30915	464	0.015	0.07	31850	30	0.015	0.07
F690TX	0.3×2	36,740	605	0.012	0.06	33400	550	0.012	0.06	30060	440	0.012	0.06	26541.667	20	0.012	0.06
F690TX	0.3×3	30,448	572	0.01	0.05	27680	520	0.01	0.05	24912	416	0.01	0.05	21233.333	10	0.01	0.05
F690TX	0.4×1	36,960	704	0.02	0.1	33600	640	0.02	0.1	30240	512	0.02	0.1	23887.5	50	0.02	0.1
F690TX	0.4×2	35,750	682	0.018	0.08	32500	620	0.018	0.08	29250	496	0.018	0.08	19906.25	45	0.018	0.08
F690TX	0.4×3	29,480	660	0.015	0.06	26800	600	0.015	0.06	24120	480	0.015	0.06	15925	40	0.015	0.06
F690TX	0.4×4	26,785	638	0.01	0.05	24350	580	0.01	0.05	21915	464	0.01	0.05	14332.5	30	0.01	0.05
F690TX	0.5×1	35,200	748	0.03	0.12	32,000	680	0.03	0.12	28800	544	0.03	0.12	21500	70	0.03	0.12
F690TX	0.5×2	35,112	730	0.029	0.117	31,920	664	0.029	0.117	28728	531	0.026	0.117	20,100	68	0.011	0.117
F690TX	0.5×3	28,072	563	0.023	0.113	25,520	512	0.023	0.113	22968	410	0.020	0.113	16,100	52	0.008	0.113
F690TX	0.5×4	25,608	484	0.016	0.108	23,280	440	0.016	0.108	20952	352	0.014	0.108	14,600	45	0.006	0.108
F690TX	0.5×5	23,232	414	0.011	0.099	21,120	376	0.011	0.099	19008	301	0.010	0.099	13,300	39	0.004	0.099
F690TX	0.5×6	21,296	352	0.007	0.090	19,360	320	0.007	0.090	17424	256	0.006	0.090	12,200	33	0.003	0.090
F690TX	0.6×2	25,168	449	0.010	0.219	22,880	408	0.010	0.219	20592	326	0.010	0.219	15,200	43	0.004	0.219
F690TX	0.6×4	17,952	290	0.005	0.104	16,320	264	0.005	0.104	14688	211	0.005	0.104	10,800	28	0.002	0.1035
F690TX	0.6×6	14,784	220	0.003	0.099	13,440	200	0.003	0.099	12096	160	0.003	0.099	8,900	21	0.001	0.099
F690TX	0.6×8	13,695	198	0.003	0.05	12,450	180	0.003	0.08	11205	144	0.003	0.08	10,617	20	0.001	0.08
F690TX	0.8×4	15,400	396	0.014	0.117	14,000	360	0.014	0.117	12600	288	0.015	0.117	10,200	41	0.007	0.117
F690TX	0.8×6	12,848	299	0.008	0.108	11,680	272	0.008	0.108	10512	218	0.008	0.108	8,500	30	0.004	0.108
F690TX	0.8×8	11,264	238	0.005	0.090	10,240	216	0.005	0.090	9216	173	0.004	0.090	7,600	20	0.002	0.090
F690TX	0.8×12	10,780	220	0.003	0.08	9,800	200	0.003	0.08	8820	160	0.003	0.08	6,370	15	0.001	0.05
F690TX	1×2	14,014	770	0.03	0.9	12,740	700	0.03	0.9	11466	560	0.03	0.9	5,308	90	0.02	0.3
F690TX	1×4	12,144	722	0.030	0.870	11,040	656	0.030	0.870	9936	525	0.035	0.270	8,500	80	0.017	0.270
F690TX	1×6	9,944	572	0.0.21	0.216	9,040	520	0.0.21	0.216	8136	416	0.024	0.216	7,000	64	0.012	0.216
F690TX	1×8	8,624	431	0.016	0.189	7,840	392	0.016	0.189	7056	314	0.018	0.189	6,100	48	0.009	0.189
F690TX	1×10	7,744	282	0.011	0.126	7,040	256	0.011	0.126	6336	205	0.013	0.126	5,400	32	0.006	0.126
F690TX	1×12	7,128	185	0.008	0.072	6,480	168	0.008	0.072	5832	134	0.009	0.072	5,000	21	0.004	0.072
F690TX	1.2×6	8,272	510	0.018	0.090	7,520	464	0.018	0.090	6768	371	0.022	0.090	6,200	60	0.011	0.090
F690TX	1.2×8	8,272	510	0.018	0.090	7,520	464	0.018	0.090	6768	371	0.022	0.090	6,200	60	0.011	0.090
F690TX	1.2×10	5,984	326	0.007	0.072	5,440	296	0.007	0.072	4896	237	0.008	0.072	4,500	38	0.004	0.072
F690TX	1.5×4	11,616	959	0.045	0.450	10,560	872	0.045	0.450	9504	698	0.060	0.450	9,200	124	0.033	0450
F690TX	1.5×6	9,328	906	0.041	0.405	8,480	824	0.041	0.405	7632	659	0.055	0.405	7,400	117	0.090	0.405
F690TX	1.5×8	8,184	766	0.034	0.315	7,440	696	0.034	0.315	6696	557	0.045	0.315	6,500	99	0.025	0.315
F690TX	1.5×10	7,480	660	0.032	0.288	6,800	600	0.032	0.288	6120	480	0.042	0.288	6,000	85	0.023	0.288
F690TX	1.5×12	6,864	590	0.029	0.270	6,240	536	0.029	0.270	5616	429	0.038	0.270	5,400	76	0.021	0.270
F690TX	1.5×16	5,984	449	0.015	0.180	5,440	408	0.015	0.180	4896	326	0.020	0.180	4,700	58	0.011	0.180
F690TX	2×4	12,650	935	0.05	0.8	11,500	850	0.05	0.8	10350	680	0.05	0.8	11,148	140	0.04	0.85
F690TX	2×6	11,264	898	0.043	0.810	10,240	816	0.043	0.810	9216	653	0.060	0.810	9,700	133	0.036	0.810
F690TX	2×8	9,856	818	0.039	0.720	8,960	744	0.039	0.720	8064	595	0.055	0.720	8,400	121	0.033	0.720
F690TX	2×10	8,800	766	0.033	0.585	8,000	696	0.033	0.585	7200	557	0.047	0.585	7,600	113	0.028	0.585
F690TX	2×12	8,008	722	0.031	0.450	7,280	656	0.031	0.450	6552	525	0.044	0.0450	6,900	107	0.026	0.450

切入深度 (mm)

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

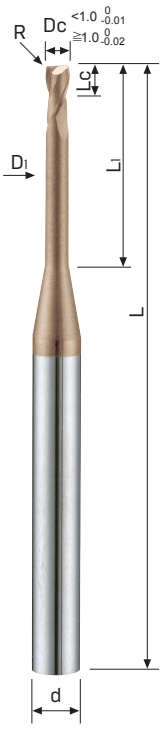
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F690TX 極超微粒鎢鋼塗層深溝環面R角立銑刀

Toric End Mills For Rib Processing With Corner Radius

Code No. F690TX-Dc×R×L1

Dc $^{0}_{-0.02}$	R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F690TX
2	R0.3	6	1.6	50	4	1.95	●
2	R0.3	8	1.6	50	4	1.95	●
2	R0.3	10	1.6	50	4	1.95	●
2	R0.3	12	1.6	50	4	1.95	●
2	R0.3	16	1.6	50	4	1.95	●
2	R0.3	20	1.6	60	4	1.95	●
2	R0.5	4	1.6	50	4	1.95	●
2	R0.5	6	1.6	50	4	1.95	●
2	R0.5	8	1.6	50	4	1.95	●
2	R0.5	10	1.6	50	4	1.95	●
2	R0.5	12	1.6	50	4	1.95	●
2	R0.5	16	1.6	50	4	1.95	●
2	R0.5	20	1.6	60	4	1.95	●
3	R0.1	6	2.5	50	6	2.85	●
3	R0.1	8	2.5	50	6	2.85	●
3	R0.1	12	2.5	50	6	2.85	●
3	R0.1	16	2.5	60	6	2.85	●
3	R0.1	20	2.5	60	6	2.85	●
3	R0.1	25	2.5	70	6	2.85	●
3	R0.1	30	2.5	70	6	2.85	●
3	R0.2	6	2.5	50	6	2.85	●
3	R0.2	8	2.5	50	6	2.85	●
3	R0.2	12	2.5	50	6	2.85	●
3	R0.2	16	2.5	60	6	2.85	●
3	R0.2	20	2.5	60	6	2.85	●
3	R0.2	25	2.5	70	6	2.85	●
3	R0.2	30	2.5	70	6	2.85	●
3	R0.3	6	2.5	50	6	2.85	●
3	R0.3	8	2.5	50	6	2.85	●
3	R0.3	12	2.5	50	6	2.85	●
3	R0.3	16	2.5	60	6	2.85	●
3	R0.3	20	2.5	60	6	2.85	●
3	R0.3	25	2.5	70	6	2.85	●
3	R0.3	30	2.5	70	6	2.85	●
3	R0.5	6	2.5	50	6	2.85	●
3	R0.5	8	2.5	50	6	2.85	●
3	R0.5	12	2.5	50	6	2.85	●
3	R0.5	16	2.5	60	6	2.85	●
3	R0.5	20	2.5	60	6	2.85	●
3	R0.5	25	2.5	70	6	2.85	●
3	R0.5	30	2.5	70	6	2.85	●
4	R0.1	8	4	60	6	3.85	●
4	R0.1	12	4	60	6	3.85	●
4	R0.1	16	4	60	6	3.85	●
4	R0.1	20	4	70	6	3.85	●
4	R0.1	25	4	70	6	3.85	●
4	R0.1	30	4	80	6	3.85	●
4	R0.1	40	4	90	6	3.85	●
4	R0.2	8	4	60	6	3.85	●
4	R0.2	12	4	60	6	3.85	●
4	R0.2	16	4	60	6	3.85	●
4	R0.2	20	4	70	6	3.85	●
4	R0.2	25	4	70	6	3.85	●
4	R0.2	30	4	80	6	3.85	●
4	R0.2	40	4	90	6	3.85	●
4	R0.3	8	4	60	6	3.85	●
4	R0.3	12	4	60	6	3.85	●
4	R0.3	16	4	60	6	3.85	●
4	R0.3	20	4	70	6	3.85	●
4	R0.3	25	4	70	6	3.85	●
4	R0.3	30	4	80	6	3.85	●
4	R0.3	40	4	90	6	3.85	●
4	R0.5	8	4	60	6	3.85	●
4	R0.5	12	4	60	6	3.85	●
4	R0.5	16	4	60	6	3.85	●
4	R0.5	20	4	70	6	3.85	●
4	R0.5	25	4	70	6	3.85	●
4	R0.5	30	4	80	6	3.85	●
4	R0.5	40	4	90	6	3.85	●
4	R1	8	4	60	6	3.85	●
4	R1	12	4	60	6	3.85	●
4	R1	16	4	60	6	3.85	●
4	R1	20	4	70	6	3.85	●
4	R1	25	4	70	6	3.85	●
4	R1	30	4	80	6	3.85	●
4	R1	40	4	90	6	3.85	●
5	R0.2	20	4	70	6	4.85	●
5	R0.2	40	4	90	6	4.85	●
5	R0.3	20	4	70	6	4.85	●
5	R0.3	40	4	90	6	4.85	●
5	R0.5	20	4	70	6	4.85	●
5	R0.5	40	4	90	6	4.85	●
5	R1	20	4	70	6	4.85	●
5	R1	40	4	90	6	4.85	●
6	R0.2	12	5	60	6	5.85	●
6	R0.2	18	5	60	6	5.85	●
6	R0.2	24	5	70	6	5.85	●
6	R0.2	36	5	80	6	5.85	●
6	R0.2	54	5	100	6	5.85	●
6	R0.3	12	5	60	6	5.85	●
6	R0.3	18	5	60	6	5.85	●
6	R0.3	24	5	70	6	5.85	●
6	R0.3	36	5	80	6	5.85	●
6	R0.3	54	5	100	6	5.85	●
6	R0.5	12	5	60	6	5.85	●
6	R0.5	18	5	60	6	5.85	●
6	R0.5	24	5	70	6	5.85	●
6	R0.5	36	5	80	6	5.85	●
6	R0.5	54	5	100	6	5.85	●
6	R1	12	5	60	6	5.85	●
6	R1	18	5	60	6	5.85	●
6	R1	24	5	70	6	5.85	●
6	R1	36	5	80	6	5.85	●
6	R1	54	5	100	6	5.85	●



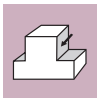
Steel < 70HRC

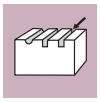
P	H	M	K	N	S
●	●		○	○	

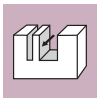
SMG Carbide

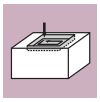
AlTiSiN TX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F690TX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 / GR.2 低合金鋼 / GR.3 高合金鋼 Carbon Steel / Low-alloyed Steel / Hi-alloyed Steel (-24HRC) (-30HRC)				GR.4 硬化鋼 / GR.5 硬化鋼 Hardened Steel/ Hardened Steel (38~48HRC) (30~38HRC)				GR.6 硬化鋼 Hardened Steel (48~56HRC)				GR.7 硬化鋼 Hardened Steel (56~68HRC)			
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)
F690TX	2×16	6,864	607	0.028	0.315	6,240	552	0.028	0.315	5616	442	0.039	0.315	5,900	90	0.023	0.315
F690TX	2×20	6,160	563	0.017	0.198	5,600	512	0.017	0.198	5040	410	0.024	0.198	5,300	84	0.014	0.198
F690TX	3×6	13,200	1,375	0.15	0.8	12,000	1,250	0.15	0.8	10800	1000	0.15	0.8	12,740	300	0.15	0.8
F690TX	3×8	12,320	1,329	0.15	0.72	11,200	1,208	0.15	0.72	10080	966	0.15	0.72	12,000	270	0.1	0.72
F690TX	3×12	9,240	1,012	0.105	0.670	8,400	920	0.105	0.670	7560	736	0.105	0.670	9,000	200	0.075	0.670
F690TX	3×16	8,096	845	0.081	0.630	7,360	768	0.081	0.630	6624	614	0.081	0.630	7,900	173	0.054	0.630
F690TX	3×20	7,392	774	0.073	0.580	6,720	704	0.073	0.580	6048	563	0.073	0.580	7,100	150	0.044	0.580
F690TX	3×25	6,600	722	0.065	0.495	6,000	656	0.065	0.495	5400	525	0.065	0.495	6,400	146	0.043	0.495
F690TX	3×30	6,160	634	0.050	0.380	5,600	576	0.050	0.380	5040	461	0.050	0.380	6,000	118	0.029	0.360
F690TX	4×8	8,800	990	0.1	1.2	8,000	900	0.1	1.2	7200	720	0.1	1.2	7,963	230	0.09	1.3
F690TX	4×12	7,832	950	0.083	1.150	7,120	864	0.083	1.150	6408	691	0.120	1.150	6,400	215	0.085	1.150
F690TX	4×16	6,952	906	0.065	1.000	6,320	824	0.065	1.000	5688	659	0.100	1.000	5,600	205	0.065	1.000
F690TX	4×20	6,072	871	0.054	0.900	5,520	792	0.054	0.900	4968	634	0.080	0.900	4,900	198	0.058	0.900
F690TX	4×25	5,456	792	0.043	0.8	4,960	720	0.043	0.8	4464	576	0.065	0.8	4,500	175	0.043	0.8
F690TX	4×30	4,840	634	0.027	0.648	4,400	576	0.027	0.648	3960	461	0.04	0.6	3,900	144	0.029	0.648
F690TX	4×40	4,048	317	0.007	0.315	3,680	288	0.007	0.315	3312	230	0.01	0.315	3,300	72	0.007	0.315
F690TX	5×20	7,007	935	0.05	0.9	6,370	850	0.05	0.9	5733	680	0.05	0.9	6,370	250	0.06	0.9
F690TX	5×40	5,606	770	0.01	0.3	5,096	700	0.01	0.3	4586	560	0.01	0.3	5,733	90	0.03	0.3
F690TX	6×12	5,830	946	0.1	1.0	5,300	860	0.1	1.0	4770	688	0.1	1.0	5,308	200	0.1	1.0
F690TX	6×18	5,170	880	0.05	0.9	4,700	800	0.05	0.9	4230	640	0.05	0.9	4,778	160	0.05	0.9
F690TX	6×24	4,620	770	0.04	0.8	4,200	700	0.04	0.8	3780	560	0.04	0.8	4,247	130	0.04	0.8
F690TX	6×36	4,070	517	0.02	0.6	3,700	470	0.02	0.6	3330	376	0.02	0.6	3,716	120	0.02	0.6
F690TX	6×54	3,498	275	0.01	0.3	3,180	250	0.01	0.3	2862	200	0.01	0.3	3,185	90	0.01	0.3

切入深度 (mm)

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

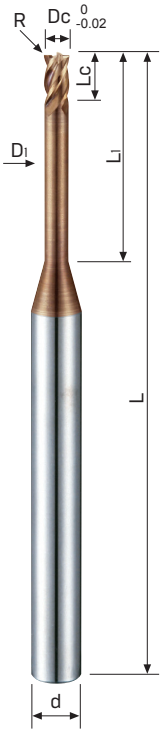
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F693TX 極超微粒鎢鋼塗層深溝環面R角立銑刀

Toric End Mills For Rib Processing With Corner Radius

Code No. F693TX-Dc×R×L1

Dc 0 -0.02	R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F693TX
1	R0.1	4	0.8	50	4	0.95	●
1	R0.1	6	0.8	50	4	0.95	●
1	R0.1	8	0.8	50	4	0.95	●
1	R0.1	10	0.8	50	4	0.95	●
1	R0.1	12	0.8	50	4	0.95	●
1	R0.2	4	0.8	50	4	0.95	●
1	R0.2	6	0.8	50	4	0.95	●
1	R0.2	8	0.8	50	4	0.95	●
1	R0.2	10	0.8	50	4	0.95	●
1	R0.2	12	0.8	50	4	0.95	●
1	R0.3	4	0.8	50	4	0.95	●
1	R0.3	6	0.8	50	4	0.95	●
1	R0.3	8	0.8	50	4	0.95	●
1	R0.3	10	0.8	50	4	0.95	●
1	R0.3	12	0.8	50	4	0.95	●
1.5	R0.1	4	1.2	50	4	1.45	●
1.5	R0.1	6	1.2	50	4	1.45	●
1.5	R0.1	8	1.2	50	4	1.45	●
1.5	R0.1	10	1.2	50	4	1.45	●
1.5	R0.1	12	1.2	50	4	1.45	●
1.5	R0.1	16	1.2	50	4	1.45	●
1.5	R0.2	4	1.2	50	4	1.45	●
1.5	R0.2	6	1.2	50	4	1.45	●
1.5	R0.2	8	1.2	50	4	1.45	●
1.5	R0.2	12	1.2	50	4	1.45	●
1.5	R0.2	16	1.2	50	4	1.45	●
1.5	R0.3	4	1.2	50	4	1.45	●
1.5	R0.3	6	1.2	50	4	1.45	●
1.5	R0.3	8	1.2	50	4	1.45	●
1.5	R0.3	12	1.2	50	4	1.45	●
1.5	R0.3	16	1.2	50	4	1.45	●
2	R0.1	6	1.6	50	4	1.95	●
2	R0.1	8	1.6	50	4	1.95	●
2	R0.1	12	1.6	50	4	1.95	●
2	R0.1	16	1.6	50	4	1.95	●
2	R0.1	20	1.6	60	4	1.95	●
2	R0.2	6	1.6	50	4	1.95	●
2	R0.2	8	1.6	50	4	1.95	●
2	R0.2	12	1.6	50	4	1.95	●
2	R0.2	16	1.6	50	4	1.95	●
2	R0.2	20	1.6	60	4	1.95	●
2	R0.3	6	1.6	50	4	1.95	●
2	R0.3	8	1.6	50	4	1.95	●
2	R0.3	12	1.6	50	4	1.95	●
2	R0.3	16	1.6	50	4	1.95	●
2	R0.3	20	1.6	60	4	1.95	●
2	R0.5	6	1.6	50	4	1.95	●
2	R0.5	8	1.6	50	4	1.95	●
2	R0.5	12	1.6	50	4	1.95	●
2	R0.5	16	1.6	50	4	1.95	●
2	R0.5	20	1.6	60	4	1.95	●
3	R0.1	8	2.5	50	6	2.85	●
3	R0.1	12	2.5	50	6	2.85	●
3	R0.1	16	2.5	60	6	2.85	●
3	R0.1	20	2.5	60	6	2.85	●
3	R0.1	25	2.5	70	6	2.85	●
3	R0.1	30	2.5	70	6	2.85	●
3	R0.2	8	2.5	50	6	2.85	●
3	R0.2	12	2.5	50	6	2.85	●
3	R0.2	16	2.5	60	6	2.85	●
3	R0.2	20	2.5	60	6	2.85	●
3	R0.2	25	2.5	70	6	2.85	●
3	R0.2	30	2.5	70	6	2.85	●
3	R0.3	8	2.5	50	6	2.85	●
3	R0.3	12	2.5	50	6	2.85	●
3	R0.3	16	2.5	60	6	2.85	●
3	R0.3	20	2.5	60	6	2.85	●
3	R0.3	25	2.5	70	6	2.85	●
3	R0.3	30	2.5	70	6	2.85	●
3	R0.5	8	2.5	50	6	2.85	●
3	R0.5	12	2.5	50	6	2.85	●
3	R0.5	16	2.5	60	6	2.85	●
3	R0.5	20	2.5	60	6	2.85	●
3	R0.5	25	2.5	70	6	2.85	●
3	R0.5	30	2.5	70	6	2.85	●
4	R0.1	12	4	60	6	3.85	●
4	R0.1	16	4	60	6	3.85	●
4	R0.1	20	4	70	6	3.85	●
4	R0.1	30	4	80	6	3.85	●
4	R0.1	40	4	90	6	3.85	●
4	R0.2	12	4	60	6	3.85	●
4	R0.2	16	4	60	6	3.85	●
4	R0.2	20	4	70	6	3.85	●
4	R0.2	30	4	80	6	3.85	●
4	R0.2	40	4	90	6	3.85	●
4	R0.3	12	4	60	6	3.85	●
4	R0.3	16	4	60	6	3.85	●
4	R0.3	20	4	70	6	3.85	●
4	R0.3	30	4	80	6	3.85	●
4	R0.3	40	4	90	6	3.85	●
4	R0.5	12	4	60	6	3.85	●
4	R0.5	16	4	60	6	3.85	●
4	R0.5	20	4	70	6	3.85	●
4	R0.5	30	4	80	6	3.85	●
4	R0.5	40	4	90	6	3.85	●
4	R1	12	4	60	6	3.85	●
4	R1	16	4	60	6	3.85	●
4	R1	20	4	70	6	3.85	●
4	R1	30	4	80	6	3.85	●
4	R1	40	4	90	6	3.85	●
5	R0.2	20	5	70	6	4.85	●
5	R0.2	40	5	90	6	4.85	●
5	R0.3	20	5	70	6	4.85	●
5	R0.3	40	5	90	6	4.85	●
5	R0.5	20	5	70	6	4.85	●
5	R0.5	40	5	90	6	4.85	●
5	R1	20	5	70	6	4.85	●
5	R1	40	5	90	6	4.85	●
6	R0.2	36	6	80	6	5.85	●
6	R0.2	54	6	100	6	5.85	●
6	R0.3	36	6	80	6	5.85	●
6	R0.3	54	6	100	6	5.85	●
6	R0.5	36	6	80	6	5.85	●
6	R0.5	54	6	100	6	5.85	●
6	R1	36	6	80	6	5.85	●
6	R1	54	6	100	6	5.85	●

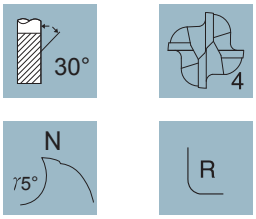


Hardened Steel 40-70HRC

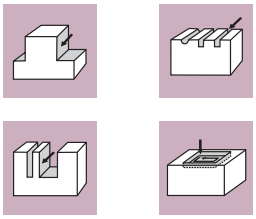
P	H	M	K	N	S
	●				

SMG Carbide

AlTiSiN TX



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)				GR.6 硬化鋼 Hardened Steel (48~56HRC)				GR.7 硬化鋼 Hardened Steel (56~68HRC)			
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)
F693TX	1×4	13,800	1,310	0.039	0.270	12,000	1,070	0.031	0.243	8,500	640	0.015	0.243
F693TX	1×6	11,300	1,040	0.021	0.216	9,800	860	0.016	0.209	7,000	510	0.01	0.108
F693TX	1×8	9,800	780	0.02	0.189	8,500	720	0.012	0.16	6,100	420	0.008	0.094
F693TX	1×10	8,800	510	0.011	0.126	7,600	510	0.009	0.1	5,400	350	0.006	0.05
F693TX	1×12	8,000	450	0.01	0.1	7,000	450	0.005	0.05	5,000	300	0.003	0.03
F693TX	1.5×4	13,200	1,360	0.054	0.054	13,200	1,280	0.042	0.495	10,100	700	0.033	0.292
F693TX	1.5×6	11,600	1,280	0.041	0.486	10,600	1,210	0.038	0.445	8,100	460	0.025	0.202
F693TX	1.5×8	10,200	1,080	0.037	0.378	9,300	1,020	0.031	0.346	7,100	390	0.015	0.157
F693TX	1.5×10	9,500	9,000	0.032	0.35	8,800	800	0.03	0.32	6,500	350	0.013	0.15
F693TX	1.5×12	8,500	830	0.029	0.324	7,800	780	0.026	0.297	5,900	300	0.01	0.162
F693TX	1.5×16	7,400	670	0.018	0.216	6,800	600	0.014	0.198	5,100	230	0.005	0.108
F693TX	2×6	12,800	1,280	0.064	0.648	12,000	1,200	0.06	0.729	9,700	700	0.028	0.324
F693TX	2×8	11,200	1,160	0.058	0.612	10,400	1,100	0.055	0.648	8,400	600	0.026	0.288
F693TX	2×12	9,100	1,030	0.046	0.405	8,500	960	0.044	0.405	6,900	420	0.018	0.180
F693TX	2×16	7,800	860	0.042	0.283	7,300	700	0.039	0.315	5,900	270	0.016	0.157
F693TX	2×20	7,000	800	0.025	0.198	6,600	650	0.024	0.198	5,300	290	0.007	0.116
F693TX	3×8	12,500	2,530	0.105	0.7	11,800	2,200	0.07	0.7	9,900	810	0.047	0.50
F693TX	3×12	10,500	2,020	0.084	0.670	10,000	1,950	0.052	0.67	8,100	660	0.037	0.5
F693TX	3×16	9,200	1,680	0.064	0.634	8,800	1,600	0.04	0.63	7,100	570	0.027	0.378
F693TX	3×20	8,400	1,540	0.058	0.580	7,900	1,490	0.036	0.58	6,300	550	0.022	0.319
F693TX	3×25	7,500	1,350	0.05	0.4	7,000	1,100	0.025	0.4	6,000	450	0.01	0.2
F693TX	3×30	7,000	1,260	0.04	0.38	6,500	1,230	0.015	0.38	5,400	390	0.007	0.144
F693TX	4×12	8,500	1,400	0.1	1.0	7,100	1,350	0.078	1.08	6,000	760	0.051	0.76
F693TX	4×16	7,900	1,370	0.091	1.0	6,600	1,330	0.071	1.0	5,600	740	0.043	0.7
F693TX	4×20	6,200	1,200	0.06	0.8	5,200	1,120	0.047	0.8	4,500	630	0.022	0.56
F693TX	4×30	5,500	960	0.037	0.648	4,600	920	0.029	0.648	3,900	600	0.011	0.388
F693TX	4×40	4,125	720	0.027	0.486	3,450	690	0.021	0.486	2,925	450	0.008	0.291
F693TX	5×20	5,800	1,730	0.18	2.358	3,500	1,000	0.1	1.31	3,000	760	0.07	1.31
F693TX	5×40	3,000	800	0.1	1.35	1,700	480	0.1	0.75	1,400	360	0.04	0.5
F693TX	6×36	4,500	1,290	0.158	2.268	2,600	740	0.158	1.260	2,200	580	0.066	1.26
F693TX	6×54	2,000	510	0.05	0.9	1,200	330	0.04	0.5	1,000	240	0.02	0.3

切入深度 (mm)

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

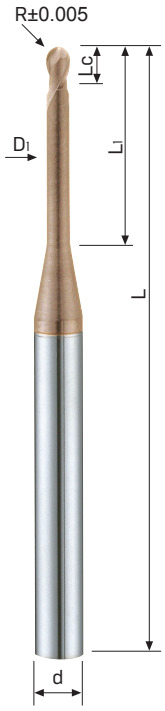
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F695TX 極超微粒鎢鋼塗層深溝圓頭立銑刀

Ball Nose End Mills For Rib Processing

Code No. F695TX-R×L1

R ±0.005	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F695TX
0.1 R	0.5	0.16	50	4	0.18	●
0.1 R	1	0.16	50	4	0.18	●
0.1 R	1.5	0.16	50	4	0.18	●
0.1 R	2	0.16	50	4	0.18	●
0.1 R	3	0.16	50	4	0.18	●
0.15R	1	0.24	50	4	0.27	●
0.15R	1.5	0.24	50	4	0.27	●
0.15R	2	0.24	50	4	0.27	●
0.15R	3	0.24	50	4	0.27	●
0.2 R	1	0.3	50	4	0.37	●
0.2 R	1.5	0.3	50	4	0.37	●
0.2 R	2	0.3	50	4	0.37	●
0.2 R	3	0.3	50	4	0.37	●
0.2 R	4	0.3	50	4	0.37	●
0.2 R	5	0.3	50	4	0.37	●
0.25R	1	0.4	50	4	0.45	●
0.25R	2	0.4	50	4	0.45	●
0.25R	3	0.4	50	4	0.45	●
0.25R	4	0.4	50	4	0.45	●
0.25R	5	0.4	50	4	0.45	●
0.25R	6	0.4	50	4	0.45	●
0.25R	8	0.4	50	4	0.45	●
0.25R	10	0.4	50	4	0.45	●
0.3 R	1	0.5	50	4	0.55	●
0.3 R	2	0.5	50	4	0.55	●
0.3 R	3	0.5	50	4	0.55	●
0.3 R	4	0.5	50	4	0.55	●
0.3 R	5	0.5	50	4	0.55	●
0.3 R	6	0.5	50	4	0.55	●
0.3 R	8	0.5	50	4	0.55	●
0.3 R	10	0.5	50	4	0.55	●
0.3 R	12	0.5	50	4	0.55	●
0.4 R	2	0.6	50	4	0.75	●
0.4 R	3	0.6	50	4	0.75	●
0.4 R	4	0.6	50	4	0.75	●
0.4 R	5	0.6	50	4	0.75	●
0.4 R	6	0.6	50	4	0.75	●
0.4 R	8	0.6	50	4	0.75	●
0.4 R	10	0.6	50	4	0.75	●
0.4 R	12	0.6	50	4	0.75	●
0.5 R	2	0.8	50	4	0.95	●
0.5 R	3	0.8	50	4	0.95	●
0.5 R	4	0.8	50	4	0.95	●
0.5 R	5	0.8	50	4	0.95	●
0.5 R	6	0.8	50	4	0.95	●
0.5 R	8	0.8	50	4	0.95	●
0.5 R	10	0.8	50	4	0.95	●
0.5 R	12	0.8	50	4	0.95	●
0.5 R	16	0.8	50	4	0.95	●
0.5 R	20	0.8	60	4	0.95	●
0.5 R	25	0.8	60	4	0.95	●
0.6 R	2	1	50	4	1.15	●
0.6 R	4	1	50	4	1.15	●
0.6 R	6	1	50	4	1.15	●
0.6 R	8	1	50	4	1.15	●
0.6 R	10	1	50	4	1.15	●
0.6 R	12	1	50	4	1.15	●
0.6 R	16	1	50	4	1.15	●
0.75R	2	1.2	50	4	1.15	●
0.75R	4	1.2	50	4	1.45	●
0.75R	6	1.2	50	4	1.45	●
0.75R	8	1.2	50	4	1.45	●
0.75R	10	1.2	50	4	1.45	●
0.75R	12	1.2	50	4	1.45	●
0.75R	12	1.2	50	4	1.45	●
0.75R	16	1.2	50	4	1.45	●
0.75R	20	1.2	60	4	1.45	●
0.75R	25	1.2	60	4	1.45	●
0.75R	30	1.2	70	4	1.45	●
1 R	3	1.6	50	4	1.45	●
1 R	4	1.6	50	4	1.95	●
1 R	6	1.6	50	4	1.95	●
1 R	8	1.6	50	4	1.95	●
1 R	10	1.6	50	4	1.95	●
1 R	12	1.6	50	4	1.95	●
1 R	16	1.6	50	4	1.95	●
1 R	20	1.6	60	4	1.95	●
1 R	25	1.6	60	4	1.95	●
1 R	30	1.6	70	4	1.95	●
1 R	35	1.6	75	4	1.95	●
1 R	40	1.6	80	4	1.95	●
1.5 R	6	2.4	50	6	2.85	●
1.5 R	8	2.4	50	6	2.85	●
1.5 R	10	2.4	50	6	2.85	●
1.5 R	12	2.4	50	6	2.85	●
1.5 R	16	2.4	60	6	2.85	●
1.5 R	20	2.4	60	6	2.85	●
1.5 R	25	2.4	70	6	2.85	●
1.5 R	30	2.4	70	6	2.85	●
1.5 R	35	2.4	80	6	2.85	●
1.5 R	40	2.4	80	6	2.85	●
2 R	8	3.2	60	6	3.85	●
2 R	10	3.2	60	6	3.85	●
2 R	12	3.2	60	6	3.85	●
2 R	16	3.2	60	6	3.85	●
2 R	20	3.2	70	6	3.85	●
2 R	25	3.2	70	6	3.85	●
2 R	30	3.2	80	6	3.85	●
2 R	35	3.2	80	6	3.85	●
2 R	40	3.2	90	6	3.85	●
2 R	45	3.2	100	6	3.85	●
2 R	50	3.2	100	6	3.85	●
2.5 R	10	4	60	6	4.85	●
2.5 R	20	4	70	6	4.85	●
2.5 R	30	4	80	6	4.85	●
2.5 R	40	4	90	6	4.85	●
2.5 R	50	4	100	6	4.85	●
3 R	12	4.8	60	6	5.85	●
3 R	20	4.8	70	6	5.85	●
3 R	30	4.8	80	6	5.85	●
3 R	40	4.8	90	6	5.85	●
3 R	50	4.8	100	6	5.85	●



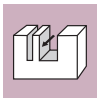
Steel < 62HRC

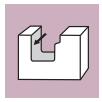
P	H	M	K	N	S
●	●		○	○	

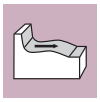
SMG Carbide

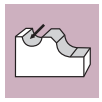
AlTiSiN TX

Type of Operation









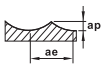
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

General processing 普通加工

被削材 Work Material		GR.1 碳鋼/GR.2 低合金鋼/GR.3 高合金鋼 Carbon Steel/Low-alloyed Steel/Hi-alloyed Steel (~24HRC) (~30HRC)				GR.4 硬化鋼 Hardened Steel (30~38HRC) / GR.5 硬化鋼 Hardened Steel (38~48HRC)				GR.6 硬化鋼 Hardened Steel (48~56HRC)				GR.7 硬化鋼 Hardened Steel (56~68HRC)			
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	ae (mm)
F695TX-R	0.1R×0.5	50,000	325	0.01	0.01	45,500	273	0.01	0.01	37,800	189	0.01	0.01	35,700	147	0.01	0.01
F695TX-R	0.1R×1.5	45,900	325	0.006	0.006	45,500	273	0.006	0.006	37,800	189	0.006	0.006	35,700	147	0.006	0.006
F695TX-R	0.1R×2	45,900	269	0.006	0.006	45,500	273	0.006	0.006	37,800	189	0.006	0.006	35,700	147	0.006	0.006
F695TX-R	0.1R×3	44,500	212	0.003	0.003	40,500	173	0.003	0.003	30,240	121	0.003	0.003	33,500	110	0.003	0.003
F695TX-R	0.15R×1	43,200	432	0.01	0.01	36,000	360	0.01	0.01	30,750	278	0.01	0.01	30,750	233	0.01	0.01
F695TX-R	0.15R×1.5	39,282	400	0.01	0.01	34,000	3,000	0.01	0.01	29,000	250	0.01	0.01	29,000	220	0.01	0.01
F695TX-R	0.15R×2	38,700	333	0.01	0.01	32,250	278	0.008	0.008	27,750	203	0.008	0.008	27,750	173	0.006	0.008
F695TX-R	0.15R×3	34,200	288	0.005	0.005	28,500	240	0.007	0.006	24,000	180	0.006	0.006	24,000	150	0.004	0.006
F695TX-R	0.2R×1	43,200	594	0.03	0.03	36,000	495	0.018	0.024	27,750	338	0.015	0.024	27,750	285	0.013	0.024
F695TX-R	0.2R×1.5	43,200	560	0.02	0.02	36,000	460	0.018	0.024	27,750	320	0.015	0.024	27,750	260	0.012	0.024
F695TX-R	0.2R×2	43,200	531	0.016	0.016	36,000	443	0.018	0.024	27,750	300	0.015	0.024	27,750	255	0.012	0.024
F695TX-R	0.2R×3	36,900	378	0.01	0.01	30,750	315	0.012	0.012	23,250	210	0.011	0.012	23,250	180	0.009	0.012
F695TX-R	0.2R×4	34,500	360	0.01	0.01	2,850	300	0.009	0.012	22,500	203	0.009	0.012	22,500	173	0.007	0.012
F695TX-R	0.2R×5	26,100	297	0.01	0.01	21,750	248	0.008	0.012	19,500	195	0.007	0.012	19,500	158	0.005	0.012
F695TX-R	0.25R×1/0.25R×2/0.25R×3	34,200	522	0.03	0.045	33,000	720	0.03	0.04	26,000	400	0.02	0.04	26,000	230	0.012	0.03
F695TX-R	0.25R×4	34,200	522	0.02	0.04	28,500	435	0.017	0.024	23,250	300	0.014	0.024	23,250	165	0.009	0.012
F695TX-R	0.25R×5	29,700	432	0.02	0.03	24,750	360	0.012	0.012	22,500	293	0.009	0.012	22,500	150	0.008	0.012
F695TX-R	0.25R×6	25,200	360	0.01	0.03	21,000	300	0.008	0.012	20,250	248	0.005	0.012	20,250	150	0.005	0.010
F695TX-R	0.25R×8	25,200	360	0.01	0.02	21,000	300	0.008	0.012	20,250	248	0.005	0.012	20,250	150	0.005	0.010
F695TX-R	0.25R×10	23,500	300	0.006	0.01	18,000	270	0.006	0.01	20,000	210	0.005	0.01	20,000	130	0.005	0.01
F695TX-R	0.3R×1/0.3R×2/0.3R×3	34,500	693	0.04	0.07	30,000	630	0.03	0.1	24,000	420	0.025	0.1	24,000	370	0.025	0.1
F695TX-R	0.3R×4/0.3R×5/0.3R×6	31,500	414	0.02	0.04	26,250	450	0.020	0.072	19,500	285	0.016	0.072	19,500	240	0.013	0.072
F695TX-R	0.3R×8	21,600	360	0.02	0.04	18,000	300	0.009	0.036	17,250	240	0.006	0.036	17,250	203	0.005	0.036
F695TX-R	0.3R×10	20,500	330	0.008	0.03	16,500	300	0.006	0.03	15,000	200	0.005	0.03	15,000	170	0.005	0.03
F695TX-R	0.3R×12	20,000	300	0.005	0.03	15,000	250	0.006	0.03	13,500	170	0.005	0.03	13,500	150	0.005	0.03
F695TX-R	0.5R×2/0.5R×3/0.5R×4	29,500	710	0.07	0.18	25,500	630	0.06	0.2	16,800	380	0.05	0.2	15,500	370	0.01	0.18
F695TX-R	0.5R×5/0.5R×6/0.5R×8	28,800	693	0.05	0.18	24,000	5,775	0.057	0.2	16,500	360	0.045	0.2	14,025	360	0.009	0.180
F695TX-R	0.5R×10	15,840	477	0.03	0.1	13,200	398	0.024	0.060	12,375	315	0.018	0.060	11,550	225	0.009	0.060
F695TX-R	0.5R×12	15,840	477	0.02	0.08	13,200	398	0.024	0.060	12,375	315	0.018	0.060	11,550	225	0.009	0.060
F695TX-R	0.5R×16	13,860	396	0.02	0.05	11,550	330	0.018	0.060	10,725	270	0.014	0.060	9,075	180	0.005	0.036
F695TX-R	0.5R×20	12,870	324	0.02	0.04	10,725	270	0.013	0.036	9,900	225	0.009	0.036	7,425	135	0.005	0.024
F695TX-R	0.5R×25	11,500	300	0.01	0.035	10,000	240	0.01	0.03	8,800	200	0.009	0.03	7,400	110	0.005	0.02
F695TX-R	0.75R×2/0.75R×4/0.75R×6	19,500	1,000	0.15	0.2	19,500	900	0.15	0.2	12,000	550	0.12	0.2	11,000	500	0.09	0.2
F695TX-R	0.75R×8/0.75R×10	14,670	630	0.1	0.155	12,225	525	0.084	0.180	9,075	338	0.069	0.180	9,075	300	0.057	0.180
F695TX-R	0.75R×12/0.75R×16	14,670	630	0.06	0.1	12,225	525	0.084	0.180	9,075	338	0.069	0.180	9,075	300	0.057	0.180
F695TX-R	0.75R×20	11,160	432	0.04	0.05	9,300	360	0.016	0.060	8,700	293	0.012	0.060	8,700	270	0.010	0.060
F695TX-R	0.75R×25	10,000	390	0.03	0.03	9,000	300	0.03	0.03	8,500	250	0.01	0.03	8,200	250	0.01	0.03
F695TX-R	0.75R×30	9,000	380	0.02	0.02	8,500	300	0.02	0.02	8,000	240	0.01	0.01	7,500	220	0.01	0.01
F695TX-R	1R×3/1R×4/1R×6/1R×8	17,000	1,200	0.2	0.2	14,500	1,000	0.2	0.2	10,000	850	0.15	0.2	10,000	650	0.08	0.2
F695TX-R	1R×10/1R×12/1R×16	16,650	1,008	0.05	0.15	13,875	840	0.05	0.15	9,900	653	0.05	0.15	9,900	533	0.03	0.15
F695TX-R	1R×20	13,230	522	0.05	0.05	11,025	435	0.05	0.05	8,700	435	0.05	0.05	8,700	360	0.05	0.05
F695TX-R	1R×30	9,540	405	0.03	0.03	7,950	338	0.03	0.03	7,650	338	0.03	0.03	7,650	270	0.03	0.03
F695TX-R	1R×40	9,100	300	0.02	0.02	7,200	280	0.02	0.02	7,200	260	0.01	0.01	6,800	230	0.01	0.01
F695TX-R	1.5R×6/1.5R×8/1.5R×10	11,610	1,512	0.15	0.2	9,675	1,260	0.1	0.2	6,900	975	0.15	0.2	4,800	533	0.15	0.2
F695TX-R	1.5R×12/1.5R×16	11,610	1,359	0.1	0.2	9,675	1,133	0.1	0.2	6,900	878	0.15	0.2	4,800	488	0.15	0.2
F695TX-R	1.5R×20	9,045	1,067	0.1	0.15	7,538	889	0.13	0.15	6,075	780	0.13	0.15	4,350	443	0.09	0.15
F695TX-R	1.5R×30	7,920	702	0.07	0.07	6,600	585	0.07	0.07	6,075	585	0.04	0.07	4,350	315	0.04	0.07
F695TX-R	1.5R×40	6,350	450	0.03	0.03	6,350	450	0.03	0.03	5,400	450	0.03	0.03	3,600	250	0.03	0.03
F695TX-R	2R×8/2R×10/2R×12	8,730	1,404	0.15	0.2	7,275	1,170	0.1	0.2	5,100	908	0.2	0.2	5,100	735	0.15	0.2
F695TX-R	2R×16/2R×20	8,730	1,287	0.13	0.2	7,275	1,073	0.1	0.2	5,100	833	0.2	0.2	5,100	660	0.15	0.2
F695TX-R	2R×30	7,560	1,125	0.1	0.15	6,300	938	0.1	0.16	4,500	735	0.15	0.15	4,500	585	0.15	0.15
F695TX-R	2R×40	5,940	855	0.08	0.1	4,950	713	0.07	0.15	4,500	735	0.1	0.15	4,500	585	0.1	0.15
F695TX-R	2R×50	5,310	423	0.05	0.1	4,425	353	0.05	0.1	4,200	368	0.05	0.1	4,200	293	0.050	0.05
F695TX-R	2.5R×10/2.5R×20	7644	764	0.15	0.3	7262	726	0.15	0.3	6899	690	0.15	0.2	6554	621	0.13	0.2
F695TX-R	2.5R×30	5733	570	0.1	0.2	5446	542	0.1	0.2	5174	514	0.1	0.15	4657	489	0.1	0.15
F695TX-R	2.5R×40	5415	550	0.08	0.15	5144	523	0.08	0.15	4887	496	0.05	0.15	4398	472	0.05	0.15
F695TX-R	2.5R×50	5096	500	0.08	0.1	4841	475	0.08	0.1	4599	451	0.05	0.1	4139	429	0.05	0.1
F695TX-R	3R×12/3R×20	5839	640	0.2	0.3	5547	608	0.2	0.3	5270	578	0.2	0.15	4743	549	0.2	0.1
F695TX-R	3R×30	4778	590	0.13	0.2	4539	561	0.13	0.2	4312	532	0.1	0.1	3881	506	0.1	0.2
F695TX-R	3R×40	4512	550	0.13	0.2	4286	523	0.13	0.2	4072	496	0.1	0.1	3665	472	0.1	0.2
F695TX-R	3R×50	4247	500	0.1	0.15	4034	475	0.1	0.15	3833	451	0.1	0.1	3449	429	0.05	0.15

切入深度
(mm)



F691TX 極超微粒鎢鋼塗層深溝立銑刀

End Mills For Rib Processing

Code No. F691TX-Dc×L1

Dc 0 -0.02	L1 mm	Lc mm	L mm	d h5	D1 mm	AlTiSiN F691TX
0.5	2	0.7	50	4	0.45	●
0.5	4	0.7	50	4	0.45	●
0.5	6	0.7	50	4	0.45	●
0.6	2	0.9	50	4	0.55	●
0.6	4	0.9	50	4	0.55	●
0.6	6	0.9	50	4	0.55	●
0.7	2	1	50	4	0.65	●
0.7	4	1	50	4	0.65	●
0.7	6	1	50	4	0.65	●
0.8	4	1.2	50	4	0.75	●
0.8	6	1.2	50	4	0.75	●
0.8	8	1.2	50	4	0.75	●
1	6	1.5	50	4	0.95	●
1	8	1.5	50	4	0.95	●
1	10	1.5	50	4	0.95	●
1	12	1.5	50	4	0.95	●
1.2	6	1.8	50	4	1.15	●
1.2	10	1.8	50	4	1.15	●
1.5	6	2.3	50	4	1.45	●
1.5	8	2.3	50	4	1.45	●
1.5	10	2.3	50	4	1.45	●
1.5	12	2.3	50	4	1.45	●
1.5	14	2.3	50	4	1.45	●
1.5	16	2.3	50	4	1.45	●
1.5	20	2.3	60	4	1.45	●
2	6	3	50	4	1.95	●
2	8	3	50	4	1.95	●
2	10	3	50	4	1.95	●
2	12	3	50	4	1.95	●
2	14	3	50	4	1.95	●
2	16	3	50	4	1.95	●
2	20	3	60	4	1.95	●
2.5	8	3.7	50	4	2.4	●
2.5	10	3.7	50	4	2.4	●
2.5	12	3.7	50	4	2.4	●
2.5	16	3.7	60	4	2.4	●
3	12	4.5	50	6	2.85	●
3	14	4.5	60	6	2.85	●
3	16	4.5	60	6	2.85	●
3	18	4.5	60	6	2.85	●
3	20	4.5	60	6	2.85	●
3	25	4.5	70	6	2.85	●

尖角
Sharp Corner edge
A-1

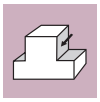
Steel < 62HRC

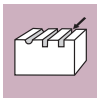
P	H	M	K	N	S
●	●		○	○	

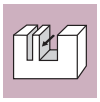
SMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

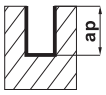
F691TX 切削條件參考表

Recommended Milling Conditions

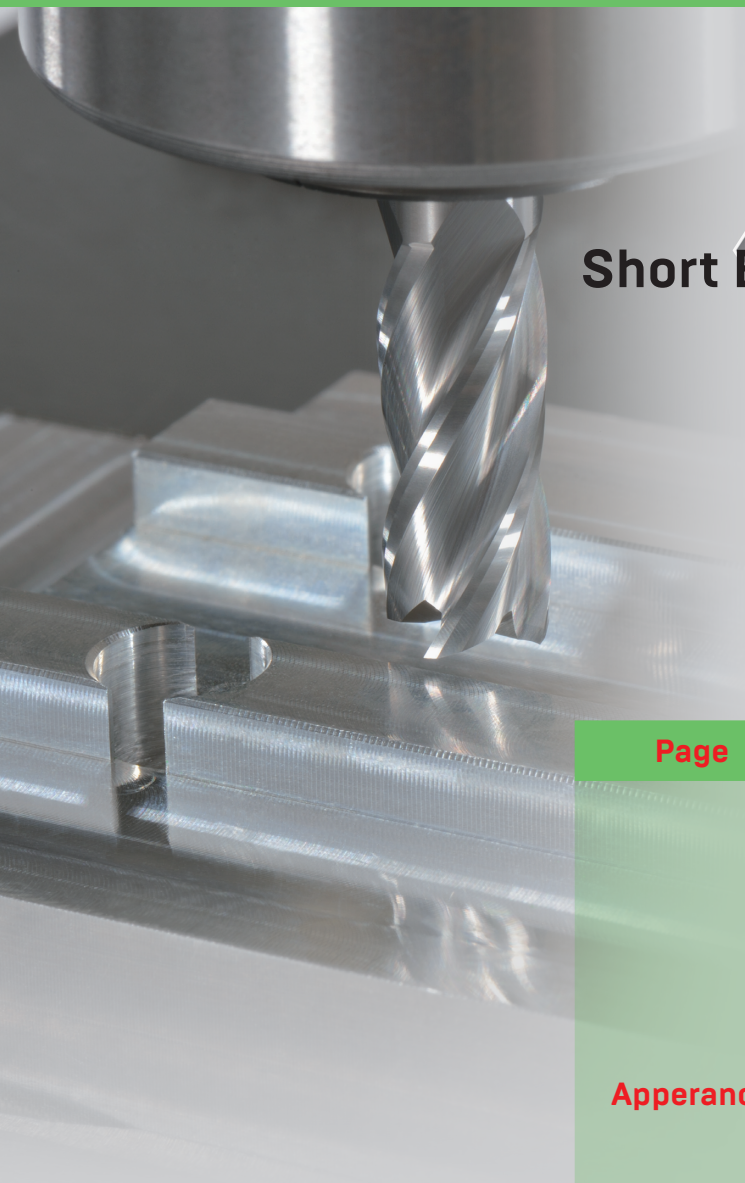
Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel			GR.2 低合金鋼 Low-alloyed Steel (~24HRC)			GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)			GR.4 硬化鋼 Hardened Steel (30~38HRC)			GR.5 硬化鋼 Hardened Steel (38~48HRC)			GR.6 硬化鋼 Hardened Steel (48~56HRC)			GR.7 硬化鋼 Hardened Steel (56~68HRC)		
型號 Code No.	刃徑×頸長 Dc×L1	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	ap (mm)
F691TX	0.5×2	45,440	720	0.015	45,440	720	0.015	43,200	608	0.014	32,480	408	0.011	32,480	408	0.011	26,000	280	0.008	14,000	20	0.008
F691TX	0.5×4	32,480	464	0.008	32,480	464	0.008	28,880	368	0.007	23,760	264	0.006	23,760	264	0.006	18,960	184	0.004	14,000	18	0.004
F691TX	0.5×6	26,720	336	0.004	26,720	336	0.004	22,800	256	0.004	19,760	200	0.003	19,760	200	0.003	15,760	136	0.002	14,000	16	0.002
F691TX	0.6×2	50,880	992	0.023	50,880	992	0.023	42,640	744	0.02	31,280	480	0.016	31,280	480	0.016	25,040	328	0.011	12,000	23	0.011
F691TX	0.6×4	33,040	592	0.012	33,040	592	0.012	27,760	440	0.011	22,320	312	0.009	22,320	312	0.009	17,840	216	0.006	12,000	21	0.006
F691TX	0.6×6	25,680	416	0.007	25,680	416	0.007	21,600	312	0.006	18,400	232	0.005	18,400	232	0.005	14,720	160	0.003	12,000	19	0.003
F691TX	0.7×2	31,120	700	0.02	31,120	700	0.02	26,160	510	0.02	20,640	360	0.02	20,640	360	0.02	16,480	240	0.01	10,000	20	0.01
F691TX	0.7×4	31,120	672	0.017	31,120	672	0.017	26,160	504	0.015	20,640	352	0.012	20,640	352	0.012	16,480	232	0.009	10,000	22	0.009
F691TX	0.7×6	24,160	480	0.01	24,160	480	0.01	20,320	360	0.009	16,960	264	0.007	16,960	264	0.007	13,520	184	0.005	10,000	20	0.005
F691TX	0.8×4	29,680	744	0.027	29,680	744	0.027	24,880	560	0.024	19,280	384	0.019	19,280	384	0.019	15,440	264	0.013	8,000	20	0.013
F691TX	0.8×6	23,040	544	0.015	23,040	544	0.015	19,360	408	0.013	15,840	296	0.01	15,840	296	0.01	12,640	200	0.007	8,000	18	0.007
F691TX	0.8×8	19,280	416	0.009	19,280	416	0.009	16,240	312	0.008	13,760	240	0.006	13,760	240	0.006	11,040	160	0.004	8,000	16	0.004
F691TX	1×6	21,200	680	0.023	21,200	680	0.023	17,680	504	0.021	14,080	352	0.016	14,080	352	0.016	11,280	248	0.012	6,500	14	0.012
F691TX	1×8	17,680	528	0.014	17,680	528	0.014	14,880	392	0.013	12,240	288	0.01	12,240	288	0.01	9,840	200	0.01	6,500	14	0.01
F691TX	1×10	15,360	424	0.01	15,360	424	0.01	12,960	320	0.009	11,040	240	0.007	11,040	240	0.007	8,800	168	0.005	6,500	12	0.005
F691TX	1×12	13,760	352	0.007	13,760	352	0.007	11,600	264	0.006	10,080	200	0.005	10,080	200	0.005	8,080	136	0.003	6,500	11	0.003
F691TX	1.2×6	19,840	776	0.037	19,840	776	0.037	16,560	576	0.034	12,880	392	0.026	12,880	392	0.026	10,240	272	0.019	9,600	22	0.019
F691TX	1.2×10	14,400	496	0.016	14,400	496	0.016	12,080	376	0.014	9,920	272	0.011	9,920	272	0.011	7,920	184	0.008	/	/	0.008
F691TX	1.5×6	18,240	896	0.057	18,240	896	0.057	15,200	672	0.051	11,520	440	0.04	11,520	440	0.04	9,200	304	0.028	9,600	60	0.028
F691TX	1.5×8	15,200	720	0.041	15,200	720	0.041	12,720	536	0.037	10,000	368	0.029	10,000	368	0.029	8,000	256	0.02	9,600	25	0.02
F691TX	1.5×10	13,280	600	0.03	13,280	600	0.03	11,040	448	0.027	8,960	312	0.021	8,960	312	0.021	7,120	216	0.015	9,600	13	0.015
F691TX	1.5×12	11,840	504	0.023	11,840	504	0.023	9,920	376	0.02	8,160	272	0.016	8,160	272	0.016	6,560	192	0.011	/	/	0.011
F691TX	1.5×14	10,720	440	0.017	10,720	440	0.017	8,960	328	0.016	7,600	240	0.012	7,600	240	0.012	6,080	168	0.009	/	/	0.009
F691TX	1.5×16	9,840	384	0.013	9,840	384	0.013	8,240	288	0.012	7,120	216	0.009	7,120	216	0.009	5,680	152	0.007	/	/	0.007
F691TX	1.5×20	8,560	296	0.009	8,560	296	0.009	7,200	224	0.008	6,320	160	0.006	6,320	160	0.006	5,040	120	0.004	/	/	0.004
F691TX	2×6	16,240	1,080	0.064	16,240	1,080	0.064	13,920	824	0.058	10,000	520	0.045	10,000	520	0.045	8,000	360	0.032	9,600	211	0.032
F691TX	2×8	13,600	872	0.054	13,600	872	0.054	11,600	664	0.048	8,640	432	0.038	8,640	432	0.038	6,960	304	0.027	9,600	89	0.027
F691TX	2×10	11,840	736	0.045	11,840	736	0.045	10,080	560	0.04	7,760	376	0.031	7,760	376	0.031	6,240	264	0.022	9,600	45	0.022
F691TX	2×12	10,560	632	0.037	10,560	632	0.037	8,960	480	0.034	7,120	336	0.026	7,120	336	0.026	5,680	232	0.019	9,600	56	0.019
F691TX	2×14	9,600	560	0.031	9,600	560	0.031	8,160	424	0.028	6,560	296	0.022	6,560	296	0.022	5,280	208	0.016	9,600	16	0.016
F691TX	2×16	8,880	496	0.026	8,880	496	0.026	7,520	376	0.024	6,160	272	0.018	6,160	272	0.018	4,880	184	0.013	9,600	11	0.013
F691TX	2×20	7,680	400	0.018	7,680	400	0.018	6,480	304	0.016	5,520	224	0.013	5,520	224	0.013	4,400	152	0.009	/	/	0.009
F691TX	2.5×8	12,000	1,072	0.077	12,000	1,072	0.077	10,240	816	0.069	7,680	536	0.054	7,680	536	0.054	6,160	368	0.039	9,600	227	0.039
F691TX	2.5×10	10,480	912	0.068	10,480	912	0.068	8,880	688	0.061	6,880	472	0.048	6,880	472	0.048	5,520	320	0.034	9,600	116	0.034
F691TX	2.5×12	9,440	800	0.06	9,440	800	0.06	8,000	600	0.054	6,320	416	0.042	6,320	416	0.042	5,040	288	0.03	9,600	67	0.03
F691TX	2.5×16	7,920	632	0.045	7,920	632	0.045	6,720	472	0.04	5,440	344	0.031	5,440	344	0.031	4,400	232	0.022	9,600	28	0.022
F691TX	3×12	8,400	888	0.081	8,400	888	0.081	6,960	664	0.073	5,360	448	0.057	5,360	448	0.057	4,240	304	0.041	8,000	128	0.041
F691TX	3×14	7,680	800	0.072	7,680	800	0.072	6,400	592	0.065	4,960	408	0.051	4,960	408	0.051	4,000	280	0.036	8,000	81	0.036
F691TX	3×16	7,120	720	0.064	7,120	720	0.064	5,920	536	0.058	4,720	376	0.045	4,720	376	0.045	3,760	256	0.032	8,000	54	0.032
F691TX	3×18	6,640	656	0.057	6,640	656	0.057	5,600	488	0.051	4,480	344	0.04	4,480	344	0.04	3,600	240	0.028	8,000	38	0.028
F691TX	3×20	6,240	600	0.05	6,240	600	0.05	5,280	448	0.045	4,240	320	0.035	4,240	320	0.035	3,440	224	0.025	8,000	27	0.025
F691TX	3×25	5,520	496	0.036	5,520	496	0.036	4,640	368	0.032	3,840	272	0.025	3,840	272	0.025	3,120	184	0.018	8,000	14	0.018

切入深度 (mm)



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.



短型立銑刀/NC車床用
Short End Mills For Lathe Machine

Page	85	85	87	87
Apperance				
Code No	E113X	E114X	E115HX	E116HX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiN X-NaNo	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX
Helix Angle	35°	35° 38°	38° 41°	38° 41°
No.of Flutes	3	不等 4	不等 3	不等 4

7leaders®
The Art of Cutting

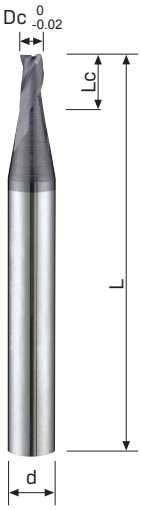
E113X 超微粒鎢鋼塗層短型立銑刀/NC車床用

Short End Mills For Lathe

MG Carbide | AlTiN X-NaNo | 35° | 3 | N γ10° | 90°

Code No. E113X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E113X
2	3	50	6	●
3	5	50	6	●
4	6	50	6	●
5	8	50	6	●
6	10	50	6	●
8	12	50	8	●
10	15	50	10	●



Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	

TWork Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

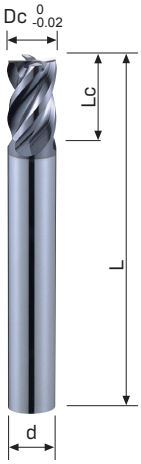
E114X 超微粒鎢鋼塗層短型立銑刀/NC車床用

Short End Mills For Lathe

MG Carbide | AlTiCrN HX | 35° 38° | 不等 4 | N γ8° | 90°

Code No. E114X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E114X
2	3	50	6	●
3	5	50	6	●
4	6	50	6	●
5	8	50	6	●
6	10	50	6	●
8	12	50	8	●
10	15	50	10	●



Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		80		80		60		50		30		80		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E113X/E114X-2	2	11,000	135	11,000	135	7,000	90	6,350	70	3,950	40	11,000	135	15,500	200
E113X/E114X-3	3	7,400	200	7,400	200	5,300	100	4,450	75	2,750	45	7,400	200	10,500	300
E113X/E114X-4	4	5,950	235	5,950	235	4,250	125	3,500	90	2,200	50	5,950	235	7,950	300
E113X/E114X-5	5	5,300	315	5,300	315	3,550	130	3,050	100	1,900	55	5,300	315	6,350	300
E113X/E114X-6	6	4,450	310	4,450	310	2,950	130	2,500	100	1,550	55	4,450	310	5,300	300
E113X/E114X-8	8	3,300	295	3,300	295	2,200	125	1,900	100	1,150	50	3,300	295	3,950	300
E113X/E114X-10	10	2,650	280	2,650	280	1,750	125	1,500	95	955	50	2,650	280	3,150	300
切入深度 (mm) 		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.02D ≥3 0.05D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

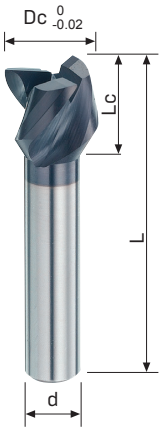
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E115HX 超微粒鎢鋼塗層短型立銑刀/NC車床用
Short End Mills For Lathe

MG Carbide | AlTiCrN HX | 38° 41° | 不等 3 | N γ5° | 90°

Code No. E115HX-Dc

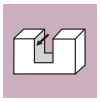
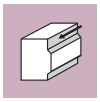
Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E115HX
3	6	35	4	●
4	6	35	4	●
5	6	35	6	●
6	6	35	6	●
7	6	35	6	●
8	6	35	6	●
9	6	35	6	●
10	6	35	6	●
12	6	35	6	●



Steel < 48HRC

P	H	M	K	N	S
●	●	●		○	

Type of Operation

Work Material

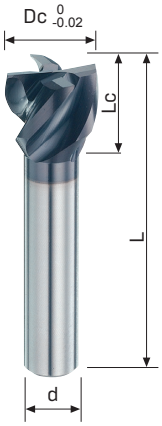
P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E116HX 超微粒鎢鋼塗層短型立銑刀/NC車床用
Short End Mills For Lathe

MG Carbide | AlTiCrN HX | 38° 41° | 不等 4 | N γ5° | 90°

Code No. E116HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E116HX
3	6	35	4	●
4	6	35	4	●
5	6	35	6	●
6	6	35	6	●
7	6	35	6	●
8	6	35	6	●
9	6	35	6	●
10	6	35	6	●
12	6	35	6	●



E115HX / E116HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

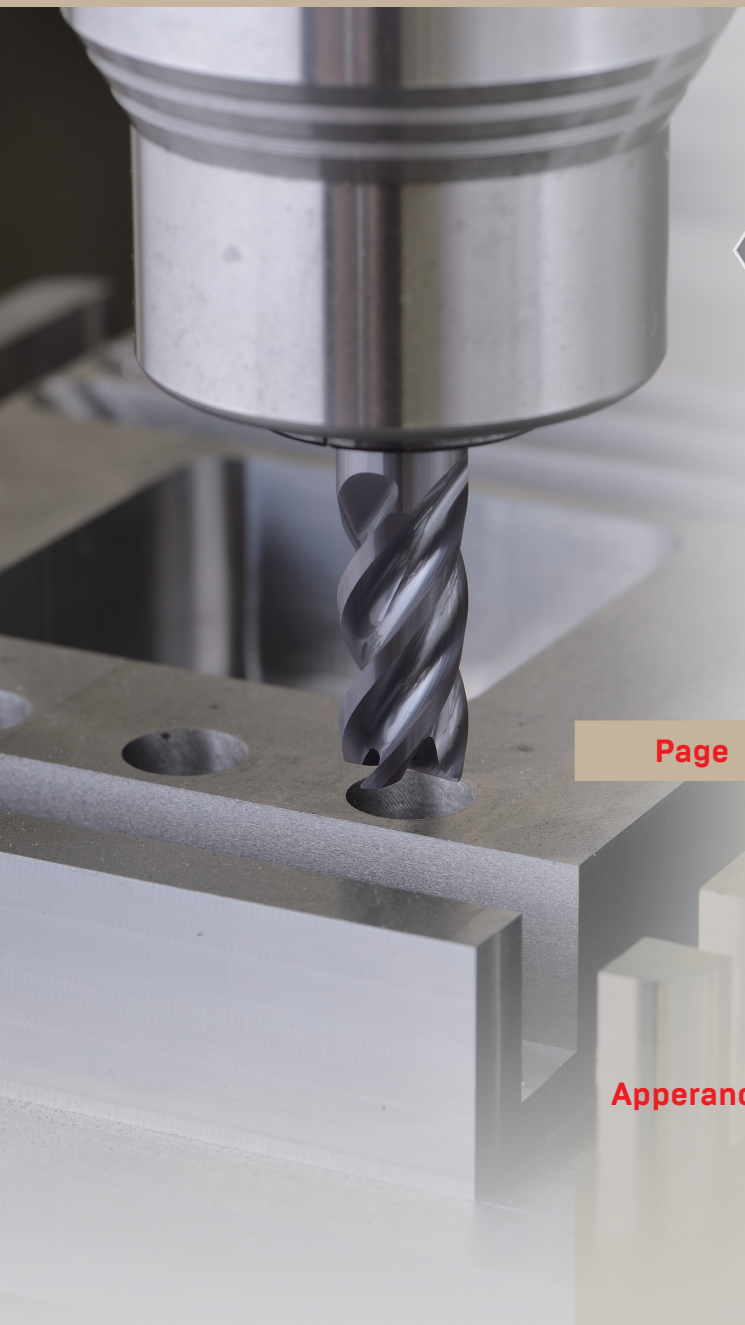
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液	
切削速度 Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E115HX/E116HX-3	3	10,000	600	10,000	600	10,000	600	7,000	400	7,000	400	6,000	300
E115HX/E116HX-4	4	7,500	600	7,500	600	7,500	600	5,200	400	5,200	400	4,500	300
E115HX/E116HX-5	5	6,000	600	6,000	600	6,000	600	4,200	400	4,200	400	3,600	300
E115HX/E116HX-6	6	5,000	600	5,000	600	5,000	600	3,500	400	3,500	400	3,000	300
E115HX/E116HX-7	7	4,500	560	4,500	560	4,500	560	3,000	360	3,000	360	2,700	280
E115HX/E116HX-8	8	4,000	520	4,000	520	4,000	520	2,800	350	2,800	350	2,400	260
E115HX/E116HX-9	9	3,600	500	3,600	500	3,600	500	2,500	320	2,500	320	2,200	250
E115HX/E116HX-10	10	3,200	450	3,200	450	3,200	450	2,200	300	2,200	300	1,900	230
E115HX/E116HX-12	12	2,700	410	2,700	410	2,700	410	1,900	270	1,900	270	1,600	210
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E115HX/E116HX-3	3	10,000	600	10,000	600	10,000	600	7,000	400	7,000	400	6,000	300
E115HX/E116HX-4	4	7,500	600	7,500	600	7,500	600	5,200	400	5,200	400	4,500	300
E115HX/E116HX-5	5	6,000	600	6,000	600	6,000	600	4,200	400	4,200	400	3,600	300
E115HX/E116HX-6	6	5,000	600	5,000	600	5,000	600	3,500	400	3,500	400	3,000	300
E115HX/E116HX-7	7	4,500	560	4,500	560	4,500	560	3,000	360	3,000	360	2,700	280
E115HX/E116HX-8	8	4,000	520	4,000	520	4,000	520	2,800	350	2,800	350	2,400	260
E115HX/E116HX-9	9	3,600	500	3,600	500	3,600	500	2,500	320	2,500	320	2,200	250
E115HX/E116HX-10	10	3,200	450	3,200	450	3,200	450	2,200	300	2,200	300	1,900	230
E115HX/E116HX-12	12	2,700	410	2,700	410	2,700	410	1,900	270	1,900	270	1,600	210
切入深度 (inch) 		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D		ap:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

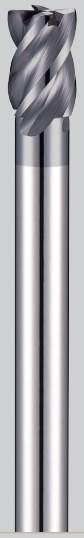
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



多用途立銑刀
Multipurpose End Mills

Page	91	93	95	97	99	101
Apperance						
Code No	E130HX	E140HX	E141-1.5HX E141-2.0HX E141-3.0HX	E141-4.0HX E141-5.0HX	E144X E146X	E144-4.0X E144-5.0X E144-6.0X
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide
Coating	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiN X-NaNo	AlTiN X-NaNo
Helix Angle	38° 41°	38° 41°	38° 41°	38° 41°	43° 48°	43° 48°
No.of Flutes	不等 3	不等 4	不等 4	不等 4	不等 4	不等 4

7leaders®
The Art of Cutting

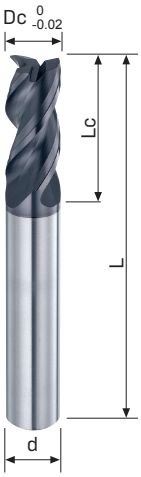
103	105	107	109	111	113	115	117	119
								
F612HX F617HX	E148HX	E149HX	B270TX	B252-2.5HX	B274HX	F636TX	F608HX F609HX	F638TX F649TX
UMG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide
AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX	AlTiCrN HX	AlTiSiN TX
 38° 41°	 38° 41°	 38° 41°	 38° 41°	 38° 41°	 38° 41°	 38° 41°	 20°	 40° 42°
不等  4	不等  4	不等  4	不等  4	不等  4	不等  4	不等  4	 4	不等  4

E130HX 超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. E130HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E130HX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3 A	8	50	4	●
4 A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
6.5	16	60	8	●
7	20	60	8	●
7.5	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	22	72	10	●
9.5	22	72	10	●
10	22	72	10	●
11	26	75	12	●
12	26	75	12	●
14	32	90	16	●
16	38	100	16	●
18	38	100	20	●
20	38	100	20	●

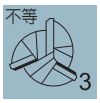


Steel < 48HRC

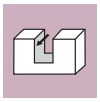
P	H	M	K	N	S
●	●	●	●	○	○

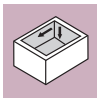
MG Carbide

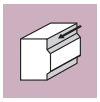
AlTiCrN HX

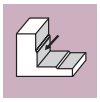


Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
H	GR5	硬化鋼 38~48HRC Hardened Steel	●
H	GR6	硬化鋼 48~56HRC Hardened Steel	
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
N	GR11	銅 Copper	○
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
S	GR16	鎳 Nickel	○
S	GR17	耐熱鋼 Heat-resistant Steel	○

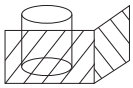
E130HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		100		100		80		65		60		65		100		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E130HX-1	1	18,000	200	18,000	200	14,500	150	12,800	140	12,800	140	12,800	140	18,000	200	12,800	50
E130HX-1.5	1.5	15,000	220	15,000	220	12,500	180	11,000	160	11,000	160	11,000	160	15,000	220	11,200	52
E130HX-2	2	12,000	400	12,000	400	10,000	300	9,500	230	9,500	230	9,500	230	12,000	400	8,200	50
E130HX-2.5	2.5	10,000	450	10,000	450	8,000	400	7,600	250	7,600	250	7,600	250	10,000	450	5,000	52
E130HX-3	3	9,000	600	9,000	600	6,600	550	6,000	300	3,800	80	6,000	300	9,000	600	3,100	50
E130HX-4	4	6,600	650	6,600	650	5,000	630	4,500	350	2,800	90	4,500	350	6,600	650	2,300	60
E130HX-5	5	5,300	700	5,300	700	4,000	635	3,500	360	2,200	95	3,500	360	5,300	700	1,900	65
E130HX-6	6	5,300	720	5,300	720	4,000	645	3,500	300	2,200	130	3,500	300	5,300	720	1,900	80
E130HX-8	8	4,000	700	4,000	700	3,000	565	2,600	200	1,600	140	2,600	200	4,000	700	1,400	90
E130HX-10	10	3,200	620	3,200	620	2,400	550	2,100	230	1,300	140	2,100	230	3,200	620	1,100	95
E130HX-12	12	2,600	580	2,600	580	2,000	500	1,700	225	1,100	115	1,700	225	2,600	580	1,000	80
E130HX-14	14	2,300	550	2,300	550	1,800	450	1,400	200	900	100	1,400	200	230	550	900	70
E130HX-16	16	2,000	500	2,000	500	1,500	400	1,300	160	830	90	1,300	160	2,000	500	720	65
E130HX-18	18	1,800	450	1,800	450	1,400	350	1,200	140	700	80	1,200	140	1,800	450	650	65
E130HX-20	20	1,500	420	1,500	420	1,200	315	1,000	150	650	70	1,000	150	1,500	420	600	65
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Plunge milling 插銑

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		100		100		80		65		60		65		100		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E130HX-3	3	8,500	320	8,500	320	6,300	200	5,800	110	5,800	110	5,800	105	8,500	320	4,800	80
E130HX-4	4	6,300	350	6,300	350	4,700	205	4,200	110	4,200	110	4,200	110	6,300	350	3,600	85
E130HX-5	5	5,000	350	5,000	350	3,800	210	3,500	120	3,500	120	3,500	125	5,000	350	2,800	90
E130HX-6	6	4,200	380	4,200	380	3,200	220	2,800	130	2,800	130	2,800	120	4,200	380	2,400	95
E130HX-8	8	3,200	350	3,200	350	2,400	210	2,200	120	2,200	120	2,200	120	3,200	350	1,800	85
E130HX-10	10	2,500	300	2,500	300	1,800	180	1,700	100	1,700	100	1,700	105	2,500	300	1,500	70
E130HX-12	12	2,000	300	2,000	300	1,600	190	1,400	100	1,400	100	1,400	100	2,000	300	1,200	70
E130HX-14	14	1,800	200	1,800	200	1,400	160	1,300	80	1,300	80	1,300	80	1,800	200	1,000	60
E130HX-16	16	1,500	180	1,500	180	1,200	140	1,200	80	1,200	80	1,200	80	1,500	180	800	60
E130HX-18	18	1,400	150	1,400	150	1,000	120	1,000	60	1,000	60	1,000	60	1,400	150	700	50
E130HX-20	20	1,300	100	1,300	100	800	80	800	60	800	60	800	60	1,300	100	600	50
切入深度 (mm) 																	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

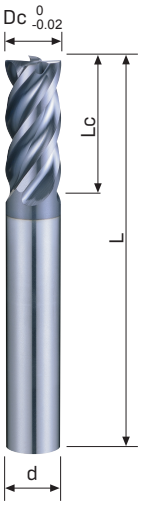
E140HX 超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. E140HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E140HX
1	3	50	4	●
1.1	3	50	4	●
1.2	4	50	4	●
1.3	4	50	4	●
1.4	4	50	4	●
1.5	5	50	4	●
1.6	5	50	4	●
1.7	5	50	4	●
1.8	5	50	4	●
1.9	5	50	4	●
2	6	50	4	●
2.1	6	50	4	●
2.2	6	50	4	●
2.3	6	50	4	●
2.4	8	50	4	●
2.5	8	50	4	●
2.6	8	50	4	●
2.7	8	50	4	●
2.8	8	50	4	●
2.9	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.1	10	50	6	●
3.2	10	50	6	●
3.3	10	50	6	●
3.4	10	50	6	●
3.5	10	50	6	●
3.6	10	50	6	●
3.7	10	50	6	●
3.8	11	50	6	●
3.9	11	50	6	●
4	11	50	6	●
4.1	11	50	6	●
4.2	11	50	6	●
4.3	11	50	6	●
4.4	11	50	6	●
4.5	11	50	6	●
4.6	11	50	6	●
4.7	11	50	6	●
4.8	13	50	6	●
4.9	13	50	6	●
5	13	50	6	●
5.1	13	50	6	●
5.2	13	50	6	●
5.3	13	50	6	●
5.4	13	50	6	●
5.5	13	50	6	●
5.6	16	50	6	●
5.7	16	50	6	●
5.8	16	50	6	●
5.9	16	50	6	●
6	16	50	6	●
6.1	16	60	8	●
6.2	16	60	8	●
6.3	16	60	8	●
6.4	16	60	8	●
6.5	16	60	8	●
6.6	20	60	8	●
6.7	20	60	8	●
6.8	20	60	8	●
6.9	20	60	8	●
7	20	60	8	●
7.1	20	60	8	●

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E140HX
7.2	20	60	8	●
7.3	20	60	8	●
7.4	20	60	8	●
7.5	20	60	8	●
7.6	20	60	8	●
7.7	20	60	8	●
7.8	20	60	8	●
7.9	20	60	8	●
8	20	60	8	●
8.1	20	72	10	●
8.2	20	72	10	●
8.3	20	72	10	●
8.4	20	72	10	●
8.5	20	72	10	●
8.6	22	72	10	●
8.7	22	72	10	●
8.8	22	72	10	●
8.9	22	72	10	●
9	22	72	10	●
9.1	22	72	10	●
9.2	22	72	10	●
9.3	22	72	10	●
9.4	22	72	10	●
9.5	22	72	10	●
9.6	22	72	10	●
9.7	22	72	10	●
9.8	22	72	10	●
9.9	22	72	10	●
10	22	72	10	●
10-25	25	75	10	●
10.1	22	75	12	●
10.2	22	75	12	●
10.3	22	75	12	●
10.4	22	75	12	●
10.5	22	75	12	●
10.6	26	75	12	●
10.7	26	75	12	●
10.8	26	75	12	●
10.9	26	75	12	●
11	26	75	12	●
11.1	26	75	12	●
11.2	26	75	12	●
11.3	26	75	12	●
11.4	26	75	12	●
11.5	26	75	12	●
11.6	26	75	12	●
11.7	26	75	12	●
11.8	26	75	12	●
11.9	26	75	12	●
12	26	75	12	●
12-30	30	75	12	●
13	26	80	12	●
14	32	90	16	●
15	38	100	16	●
16	38	100	16	●
17	38	100	20	●
18	38	100	20	●
19	38	100	20	●
20	38	100	20	●
25	45	120	25	●



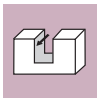
Steel < 48HRC

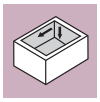
P	H	M	K	N	S
●	●	●	●	○	○

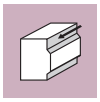
MG Carbide

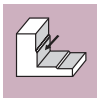
AlTiCrN HX

Type of Operation









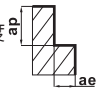
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

E140HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

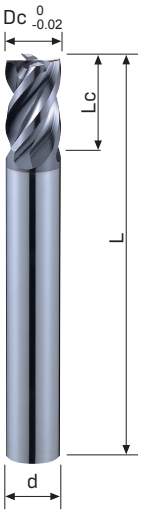
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E140HX-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240	7,100	50
E140HX-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245	5,100	100
E140HX-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245	4,000	120
E140HX-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370	3,200	150
E140HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E140HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E140HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E140HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E140HX-7	7	3,360	820	3,360	820	2,620	600	2,075	413	2,000	125	2,075	413	3,360	820	1,400	180
E140HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E140HX-9	9	3,410	770	3,410	770	2,280	595	1,800	390	1,750	120	1,800	390	3,410	770	1,100	165
E140HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E140HX-11	11	2,950	720	2,950	720	1,920	575	1,520	360	1,475	120	1,520	360	2,275	720	900	160
E140HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E140HX-14	14	2,040	670	2,040	670	1,590	540	1,360	320	1,250	100	1,360	350	2,040	670	700	150
E140HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E140HX-18	18	1,770	550	1,770	550	1,410	450	1,060	300	1,060	90	1,060	330	1,770	550	500	150
E140HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
E140HX-25	25	1,270	420	1,270	420	1,000	330	760	210	750	70	790	210	1,270	420	380	120
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E140HX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E140HX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E140HX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E140HX-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E140HX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E140HX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E140HX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E140HX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E140HX-7	7	3,360	710	3,360	710	2,620	500	2,075	313	2,000	125	2,075	313	3,360	710	1,400	130
E140HX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E140HX-9	9	3,410	660	3,410	660	2,280	495	1,800	300	1,750	120	1,800	300	3,410	660	1,100	130
E140HX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E140HX-11	11	2,950	615	2,950	615	1,920	475	1,520	280	1,475	120	1,520	280	2,275	615	900	150
E140HX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E140HX-14	14	2,040	500	2,040	500	1,590	440	1,360	250	1,250	100	2,040	250	2,040	660	700	150
E140HX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E140HX-18	18	1,770	550	1,770	550	1,410	400	1,060	230	970	90	1,770	220	1,770	500	500	140
E140HX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

Code No. E141-1.5HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-1.5HX
1	1.5	50	4	●
1.5	2.3	50	4	●
2	3	50	4	●
2.5	3.8	50	4	●
3	4.5	50	6	●
3.5	5.3	50	6	●
4	6	50	6	●
4.5	6.8	50	6	●
5	7.5	50	6	●
5.5	8.3	50	6	●
6	9	50	6	●
8	12	65	8	●
10	15	75	10	●
12	18	80	12	●
16	24	100	16	●
20	30	120	20	●



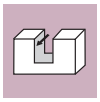
Steel < 48HRC

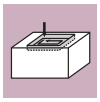
P	H	M	K	N	S
●	●	●	●	○	○

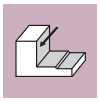
MG Carbide

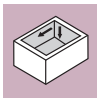
AlTiCrN HX

Type of Operation



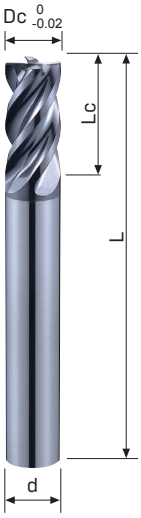






Code No. E141-2.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-2.0HX
1	2	50	4	●
1.5	3	50	4	●
2	4	50	4	●
2.5	5	50	4	●
3	6	50	6	●
3.5	7	50	6	●
4	8	50	6	●
4.5	9	50	6	●
5	10	50	6	●
5.5	11	50	6	●
6	12	50	6	●
8	16	65	8	●
10	20	75	10	●
12	24	80	12	●
16	32	100	16	●
20	40	120	20	●

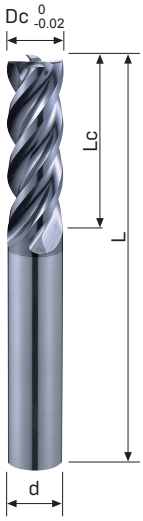


Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Code No. E141-3.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-3.0HX
1	3	50	4	●
1.5	4.5	50	4	●
2	6	50	4	●
2.5	7.5	50	4	●
3	9	50	6	●
3.5	10.5	50	6	●
4	12	50	6	●
4.5	13.5	50	6	●
5	15	50	6	●
5.5	16.5	50	6	●
6	18	50	6	●
7	21	65	8	●
8	24	65	8	●
9	27	75	10	●
10	30	75	10	●
11	33	80	12	●
12	36	80	12	●
13	39	100	16	●
14	42	100	16	●
15	45	100	16	●
16	48	100	16	●
17	51	120	20	●
18	54	120	20	●
20	60	120	20	●
25	75	150	25	●



E141-1.5HX / 2.0HX / 3.0HX 切削條件參考表

Recommended Milling Conditions

E141-1.5HX / 2.0HX / Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E141-1.5HX/2.0HX-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200	7,100	50
E141-1.5HX/2.0HX-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200	5,100	80
E141-1.5HX/2.0HX-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220	4,000	100
E141-1.5HX/2.0HX-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330	3,200	100
E141-1.5HX/2.0HX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
E141-1.5HX/2.0HX-3.5	3.5	8,470	615	8,470	615	6,600	465	5,250	305	5,100	110	5,250	305	8,470	615	2,800	140
E141-1.5HX/2.0HX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
E141-1.5HX/2.0HX-4.5	4.5	5,450	705	5,450	705	4,250	510	3,370	335	3,260	120	3,370	335	5,450	705	2,200	155
E141-1.5HX/2.0HX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
E141-1.5HX/2.0HX-5.5	5.5	4,040	775	4,040	775	3,160	510	2,500	330	2,400	125	2,500	330	4,040	775	1,800	150
E141-1.5HX/2.0HX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
E141-1.5HX/2.0HX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
E141-1.5HX/2.0HX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
E141-1.5HX/2.0HX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
E141-1.5HX/2.0HX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
E141-1.5HX/2.0HX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

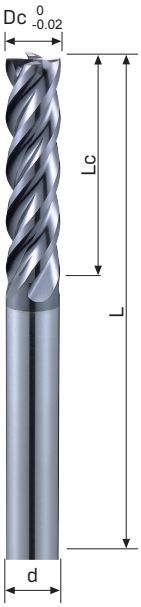
E141-3.0HX / Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E141-3.0HX-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240	7,100	50
E141-3.0HX-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245	5,100	100
E141-3.0HX-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245	4,000	120
E141-3.0HX-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370	3,200	150
E141-3.0HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
E141-3.0HX-3.5	3.5	8,470	710	8,470	710	6,600	560	5,250	400	5,100	110	5,250	400	8,470	710	2,800	180
E141-3.0HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
E141-3.0HX-4.5	4.5	5,450	805	5,450	805	4,250	605	3,370	428	3,260	120	3,370	428	5,450	805	2,200	185
E141-3.0HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
E141-3.0HX-5.5	5.5	4,040	875	4,040	875	3,160	610	2,500	428	2,400	125	2,500	428	4,040	875	1,800	190
E141-3.0HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
E141-3.0HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
E141-3.0HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
E141-3.0HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
E141-3.0HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
E141-3.0HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	160
E141-3.0HX-25	25	1,270	420	1,270	420	1,000	330	760	210	750	70	790	210	1270	420	380	120
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

Code No. E141-4.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-4.0HX
1	4	50	4	●
1.5	6	50	4	●
2	8	50	4	●
2.5	10	50	4	●
3	12	50	6	●
3.5	14	50	6	●
4	16	55	6	●
4.5	18	55	6	●
5	20	60	6	●
5.5	22	65	6	●
6	24	65	6	●
8	32	90	8	●
10	40	100	10	●
12	48	110	12	●
16	64	140	16	●
20	80	160	20	●



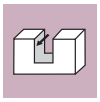
Steel < 48HRC

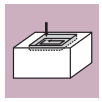
P	H	M	K	N	S
●	●	●	●	○	○

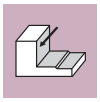
MG Carbide

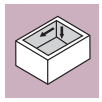
AlTiCrN HX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Code No. E141-5.0HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E141-5.0HX
1	5	50	4	●
1.5	7.5	50	4	●
2	10	50	4	●
2.5	12.5	50	4	●
3	15	55	6	●
3.5	17.5	60	6	●
4	20	60	6	●
4.5	22.5	65	6	●
5	25	65	6	●
5.5	27.5	75	6	●
6	30	75	6	●
8	40	90	8	●
10	50	100	10	●
12	60	110	12	●
16	80	160	16	●
20	100	200	20	●

E141-4.0HX / Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		90		90		60		50		45		50		90		23	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E141-4.0HX-1	1	23,850	180	23,850	180	18,750	158	14,813	135	14,250	64	14,813	135	23,850	180	5,325	38
E141-4.0HX-1.5	1.5	15,900	184	15,900	184	12,375	158	9,750	135	9,525	68	9,750	135	15,900	184	3,825	75
E141-4.0HX-2	2	11,925	184	11,925	184	9,315	158	7,388	135	7,163	68	7,388	135	11,925	184	3,000	90
E141-4.0HX-2.5	2.5	9,525	278	9,525	278	7,448	225	5,925	206	5,700	68	5,925	206	9,525	278	2,400	113
E141-4.0HX-3	3	7,950	512	7,950	512	6,210	398	4,913	291	4,800	79	4,913	291	7,950	512	2,400	135
E141-4.0HX-3.5	3.5	6,350	532	6,350	532	4,960	420	3,930	300	3,850	85	3,930	300	6,350	532	2,100	135
E141-4.0HX-4	4	4,763	551	4,763	551	3,713	443	2,963	310	2,850	90	2,963	310	4,763	551	1,800	135
E141-4.0HX-4.5	4.5	4,080	604	4,080	604	3,180	450	2,530	323	2,447	92	2,530	323	4,080	604	1,650	139
E141-4.0HX-5	5	3,412	656	3,412	656	2,663	469	2,100	336	2,047	94	2,100	336	3,412	656	1,500	143
E141-4.0HX-5.5	5.5	3,030	656	3,030	656	2,360	460	1,875	323	1,800	94	1,875	323	3,030	656	1,350	143
E141-4.0HX-6	6	2,655	656	2,655	656	2,070	450	1,650	310	1,575	94	1,650	310	2,655	656	1,200	143
E141-4.0HX-8	8	2,389	578	2,389	578	1,860	450	1,481	310	1,425	94	1,481	310	2,389	578	900	128
E141-4.0HX-10	10	2,738	578	2,738	578	1,553	446	1,234	281	1,196	90	1,234	281	2,738	578	750	120
E141-4.0HX-12	12	1,706	503	1,706	503	1,328	420	1,058	263	1,024	90	1,058	263	1,706	503	600	120
E141-4.0HX-16	16	1,493	503	1,493	503	1,163	390	923	234	893	75	923	234	1,493	503	450	113
E141-4.0HX-20	20	1,193	401	1,193	401	930	311	739	207	713	68	739	207	1,193	401	360	120
切入深度 (mm) 		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D		ap:2.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D	

E141-5.0HX / Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		60		60		40		33		30		33		60		16	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E141-5.0HX-1	1	15,900	120	15,900	120	12,500	105	9,875	90	9,500	43	9,875	90	15,900	120	3,550	25
E141-5.0HX-1.5	1.5	10,600	123	10,600	123	8,250	105	6,500	90	6,350	45	6,500	90	10,600	123	2,550	50
E141-5.0HX-2	2	7,950	123	7,950	123	6,210	105	4,925	90	4,775	45	4,925	90	7,950	123	2,000	60
E141-5.0HX-2.5	2.5	6,350	185	6,350	185	4,965	150	3,950	138	3,800	45	3,950	138	6,350	185	1,600	75
E141-5.0HX-3	3	5,300	341	5,300	341	4,140	265	3,275	194	3,200	53	3,275	194	5,300	341	1,600	90
E141-5.0HX-3.5	3.5	4,230	354	4,230	354	3,300	280	2,620	200	2,550	56	2,620	200	4,230	354	1,400	90
E141-5.0HX-4	4	3,175	368	3,175	368	2,475	295	1,975	207	1,900	60	1,975	207	3,175	368	1,200	90
E141-5.0HX-4.5	4.5	2,720	400	2,720	400	2,120	305	1,680	215	1,630	60	1,680	215	2,720	400	1,100	90
E141-5.0HX-5	5	2,275	438	2,275	438	1,775	313	1,400	224	1,365	63	1,400	224	2,275	438	1,000	95
E141-5.0HX-5.5	5.5	2,020	438	2,020	438	1,570	306	1,250	215	1,200	63	1,250	215	2,020	438	900	95
E141-5.0HX-6	6	1,770	438	1,770	438	1,380	300	1,100	207	1,050	63	1,100	207	1,770	438	800	95
E141-5.0HX-8	8	1,592	385	1,592	385	1,240	300	987	207	950	63	987	207	1,592	385	600	85
E141-5.0HX-10	10	1,825	385	1,825	385	1,035	298	823	187	798	60	823	187	1,825	385	500	80
E141-5.0HX-12	12	1,137	335	1,137	335	885	280	705	175	682	60	705	175	1,137	335	400	80
E141-5.0HX-16	16	995	335	995	335	775	260	615	156	595	50	615	156	995	335	300	75
E141-5.0HX-20	20	795	268	795	268	620	208	493	138	475	45	493	138	795	268	240	80
切入深度 (mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

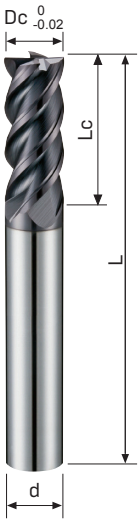
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E144X / E146X 極超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. E144X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E144X
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
3.5	10	50	6	●
4	11	50	6	●
4.5	11	50	6	●
5	13	50	6	●
5.5	13	50	6	●
6	16	50	6	●
7	20	60	8	●
8	20	60	8	●
9	25	72	10	●
10	25	72	10	●
11	30	75	12	●
12	30	75	12	●
14	40	100	16	●
16	45	100	16	●
20	50	110	20	●

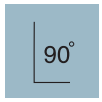


Steel < 48HRC

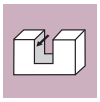
P	H	M	K	N	S
●	●	●	●		○

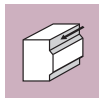
UMG Carbide

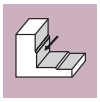
AlTiN X-NaNo



Type of Operation







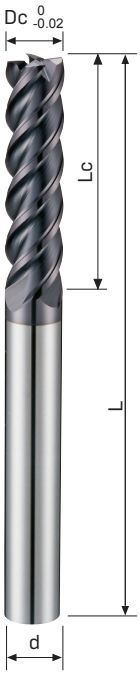
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Code No. E146X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E146X
3	15	80	4	●
4	20	80	4	●
5	25	80	6	●
6	30	80	6	●
8	35	100	8	●
10	40	100	10	●
12	50	110	12	●
14	55	140	16	●
16	60	140	16	●
20	75	160	20	●

※Out of production and sold until stock last
※停止生產，售完為止



E144X / E146X 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		80		65		60		65		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E144X-1	1	31,800	240	31,800	240	25,000	210	19,750	180	19,000	85	19,750	180	31,800	240
E144X-1.5	1.5	21,200	245	21,200	245	16,500	210	13,000	180	12,700	90	13,000	180	21,200	245
E144X-2	2	15,900	245	15,900	245	12,420	210	9,850	180	9,550	90	9,850	180	15,900	245
E144X-2.5	2.5	12,700	370	12,700	370	9,930	300	7,900	275	7,600	90	7,900	275	12,700	370
E144X/E146X-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683
E144X/E146X-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735
E144X/E146X-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875
E144X/E146X-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875
E144X/E146X-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770
E144X/E146X-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770
E144X/E146X-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670
E144X/E146X-14	14	2,130	670	2,130	670	1,660	540	1,320	331	1,277	110	1,320	330	2,130	670
E144X/E146X-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670
E144X/E146X-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		80		65		60		65		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E144X-1	1	31,800	200	31,800	200	25,000	180	19,750	150	19,000	85	19,750	150	31,800	200
E144X-1.5	1.5	21,200	200	21,200	200	16,500	180	13,000	150	12,700	90	13,000	150	21,200	200
E144X-2	2	15,900	220	15,900	220	12,420	180	9,850	150	9,550	90	9,850	150	15,900	220
E144X-2.5	2.5	12,700	330	12,700	330	9,930	220	7,900	175	7,600	90	7,900	175	12,700	330
E144X/E146X-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600
E144X/E146X-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635
E144X/E146X-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775
E144X/E146X-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775
E144X/E146X-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650
E144X/E146X-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670
E144X/E146X-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560
E144X/E146X-14	14	2,130	610	2,130	610	1,660	440	1,320	255	1,277	110	1,320	255	2,130	610
E144X/E146X-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660
E144X/E146X-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D	

※ Notice: E146X is Long Length series End Mills. Please adjust the parameter according.

※ 注意E146X為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

E144-4.0X / 5.0X / 6.0X 極超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. E144-4.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E144-4.0X
3	12	50	6	●
4	16	55	6	●
5	20	60	6	●
6	24	65	6	●
8	32	90	8	●
10	40	100	10	●
12	48	110	12	●
14	56	140	16	●
16	64	140	16	●
20	80	160	20	●

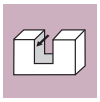
Steel < 48HRC

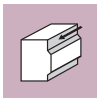
P	H	M	K	N	S
●	●	●	●		○

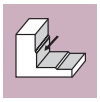
UMG Carbide

AlTiN X-NaNo

Type of Operation







Code No. E144-5.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E144-5.0X
3	15	55	6	●
4	20	60	6	●
5	25	65	6	●
6	30	75	6	●
8	40	90	8	●
10	50	100	10	●
12	60	110	12	●
14	70	140	16	●
16	80	160	16	●
20	100	200	20	●

Code No. E144-6.0X-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN E144-6.0X
3	18	70	6	●
4	24	70	6	●
5	30	80	6	●
6	36	80	6	●
8	48	100	8	●
10	60	110	10	●
12	72	120	12	●
16	96	160	16	●
20	120	200	20	●

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

E144-4.0X / 5.0X / 6.0X 切削條件參考表

E141-4.0X / Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液	
切削速度 Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E144-4.0X-3	3	11,000	618	11,000	618	11,000	618	8,500	285	5,900	199	6,800	228
E144-4.0X-4	4	8,300	659	8,300	659	8,300	659	6,400	304	4,500	213	5,100	243
E144-4.0X-5	5	6,600	669	6,600	669	6,600	669	5,100	323	3,600	227	4,100	258
E144-4.0X-6	6	5,500	680	5,500	680	5,500	680	4,200	342	3,000	239	3,400	265
E144-4.0X-8	8	4,200	699	4,200	699	4,200	699	3,200	355	2,200	241	2,600	284
E144-4.0X-10	10	3,300	689	3,300	689	3,300	689	2,600	366	1,800	240	2,000	282
E144-4.0X-12	12	2,800	633	2,800	633	2,800	633	2,200	337	1,500	220	1,700	271
E144-4.0X-14	14	2,400	538	2,400	538	2,400	538	1,800	283	1,300	194	1,400	222
E144-4.0X-16	16	2,100	466	2,100	466	2,100	466	1,600	269	1,100	188	1,300	219
E144-4.0X-20	20	1,660	454	1,660	454	1,660	454	1,270	256	890	172	1,020	201
切入深度 (mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

E141-5.0X / Side Milling 側面切削

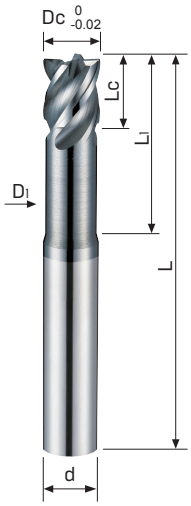
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液	
切削速度 Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E144-5.0X-3	3	9,700	464	9,700	464	9,700	464	7,400	214	5,200	149	6,000	171
E144-5.0X-4	4	7,300	494	7,300	494	7,300	494	5,600	228	3,900	160	4,500	183
E144-5.0X-5	5	5,800	502	5,800	502	5,800	502	4,500	243	3,200	171	3,600	193
E144-5.0X-6	6	4,800	510	4,800	510	4,800	510	3,700	256	2,600	179	2,900	199
E144-5.0X-8	8	3,600	524	3,600	524	3,600	524	2,800	266	2,000	181	2,200	213
E144-5.0X-10	10	2,900	217	2,900	217	2,900	217	2,200	274	1,500	180	1,800	212
E144-5.0X-12	12	2,500	475	2,500	475	2,500	475	1,900	253	1,300	165	1,500	203
E144-5.0X-16	16	1,800	349	1,800	349	1,800	349	1,400	202	1,000	141	1,100	165
E144-5.0X-20	20	1,450	341	1,450	341	1,450	341	1,110	192	780	129	890	151
切入深度 (mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D		ae:0.05D	

E141-6.0X / Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel 使用切削液	
切削速度 Vc m/min		100～120		100～120		100～120		65～80		55～70		55～70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E144-6.0X-3	3	9,700	386	9,700	386	9,700	386	7,400	178	5,200	124	6,000	143
E144-6.0X-4	4	7,300	412	7,300	412	7,300	412	5,600	190	3,900	133	4,500	152
E144-6.0X-5	5	5,800	418	5,800	418	5,800	418	4,500	202	3,200	142	3,600	161
E144-6.0X-6	6	4,800	425	4,800	425	4,800	425	3,700	214	2,600	149	2,900	166
E144-6.0X-8	8	3,600	437	3,600	437	3,600	437	2,800	222	2,000	151	2,200	177
E144-6.0X-10	10	2,900	431	2,900	431	2,900	431	2,200	228	1,500	150	1,800	176
E144-6.0X-12	12	2,500	395	2,500	395	2,500	395	1,900	211	1,300	137	1,500	169
E144-6.0X-16	16	1,800	291	1,800	291	1,800	291	1,400	168	1,000	118	1,100	137
E144-6.0X-20	20	1,450	284	1,450	284	1,450	284	1,110	160	780	107	890	126
切入深度 (mm) 		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D		ap:3.0D	
		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D		ae:0.03D	

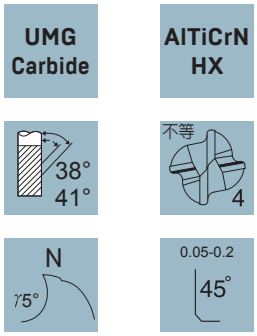
Code No. F612HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F612HX
3	4	57	6	9	2.8	●
3.5	4.5	57	6	12	3.3	●
4	5	57	6	12	3.7	●
4.5	5.5	57	6	15	4.2	●
5	6	57	6	15	4.6	●
5.5	6.5	57	6	20	5.1	●
6	7	57	6	20	5.5	●
6.5	7.5	63	8	23	6	●
7	8	63	8	23	6.4	●
7.5	8.5	63	8	26	6.9	●
8	9	63	8	26	7.4	●
8.5	9.5	72	10	29	7.9	●
9	10	72	10	29	8.3	●
9.5	10.5	72	10	31	8.8	●
10	11	72	10	31	9.2	●
10.5	11.5	83	12	34	9.7	●
11	12	83	12	34	10.2	●
11.5	12.5	83	12	37	10.6	●
12	13	83	12	37	11	●
13	14	92	16	38	11.8	●
14	15	92	16	40	12.7	●
15	16	92	16	42	13.6	●
16	17	92	16	43	14.5	●
17	18	104	20	45	15.4	●
18	19	104	20	48	16.3	●
19	20	104	20	51	17.3	●
20	21	104	20	53	18.2	●

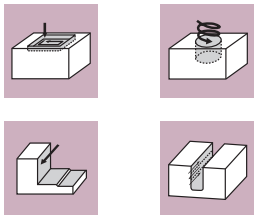


Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○



Type of Operation

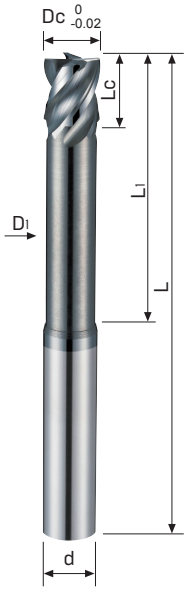


Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Code No. F617HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F617HX
3	4	70	6	18	2.8	●
3.5	4.5	70	6	22	3.3	●
4	5	70	6	22	3.7	●
4.5	5.5	70	6	28	4.2	●
5	6	70	6	28	4.6	●
5.5	6.5	70	6	33	5.4	●
6	7	70	6	33	5.5	●
6.5	7.5	80	8	38	6	●
7	8	80	8	38	6.4	●
7.5	8.5	80	8	43	6.9	●
8	9	80	8	43	7.4	●
8.5	9.5	90	10	45	7.9	●
9	10	90	10	45	8.3	●
9.5	10.5	90	10	49	8.8	●
10	11	90	10	49	9.2	●
10.5	11.5	100	12	52	9.7	●
11	12	100	12	52	10.2	●
11.5	12.5	100	12	54	10.6	●
12	13	100	12	54	11	●
13	14	115	16	60	11.8	●
14	15	115	16	62	12.7	●
15	16	115	16	64	13.6	●
16	17	115	16	66	14.5	●
17	18	130	20	70	15.4	●
18	19	130	20	74	16.3	●
19	20	130	20	76	17.3	●
20	21	130	20	79	18.2	●



F612HX / F617HX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		63		63		63		53		53		60		63	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F612HX/F617HX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683
F612HX/F617HX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735
F612HX/F617HX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875
F612HX/F617HX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875
F612HX/F617HX-7	7	3,360	820	3,360	820	2,620	600	2,085	413	2,000	125	2,085	413	3,360	820
F612HX/F617HX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770
F612HX/F617HX-9	9	3,417	770	3,417	770	2,275	600	1,810	394	1,750	120	1,810	394	3,415	770
F612HX/F617HX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770
F612HX/F617HX-11	11	2,960	720	2,960	720	1,920	575	1,525	362	1,480	120	1,525	362	2,960	720
F612HX/F617HX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670
F612HX/F617HX-13	13	2,300	670	2,300	670	1,715	550	1,365	343	1,370	115	1,365	343	2,200	670
F612HX/F617HX-14	14	2,332	670	2,332	670	1,660	540	1,320	336	1,270	110	1,320	336	2,130	670
F612HX/F617HX-15	15	2,160	670	2,160	670	1,605	530	1,275	324	1,230	105	1,275	324	2,060	670
F612HX/F617HX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670
F612HX/F617HX-17	17	1,890	635	1,890	635	1,475	490	1,160	305	1,130	95	1,160	305	1,890	635
F612HX/F617HX-18	18	1,790	600	1,790	600	1,400	465	1,100	295	1,070	95	1,100	295	1,790	600
F612HX/F617HX-19	19	1,690	570	1,690	570	1,320	440	1,040	285	1,010	90	1,040	285	1,690	670
F612HX/F617HX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		100		100		65		55		55		60		65	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F612HX/F617HX-3	3	10,600	424	10,600	424	8,280	331	6,550	262	6,400	128	6,550	262	10,600	424
F612HX/F617HX-4	4	6,350	508	6,350	508	4,950	396	3,950	316	3,800	152	3,950	316	6,350	508
F612HX/F617HX-5	5	4,550	455	4,550	455	3,550	355	2,800	280	2,730	164	2,800	280	4,550	455
F612HX/F617HX-6	6	3,540	425	3,540	425	2,760	331	2,200	264	2,100	168	2,200	264	3,540	425
F612HX/F617HX-7	7	3,360	403	3,360	403	2,620	314	2,085	250	2,000	160	2,085	250	3,360	403
F612HX/F617HX-8	8	3,185	510	3,185	510	2,480	397	1,975	316	1,900	152	1,975	316	3,185	510
F612HX/F617HX-9	9	3,417	547	3,417	547	2,275	364	1,810	290	1,750	140	1,810	290	3,415	546
F612HX/F617HX-10	10	3,650	584	3,650	584	2,070	331	1,645	263	1,595	191	1,645	263	3,650	584
F612HX/F617HX-11	11	2,960	592	2,960	592	1,920	384	1,525	305	1,480	178	1,525	305	2,960	592
F612HX/F617HX-12	12	2,275	455	2,275	455	1,770	354	1,410	282	1,365	164	1,410	282	2,275	455
F612HX/F617HX-13	13	2,300	460	2,300	460	1,715	343	1,365	273	1,370	164	1,365	273	2,200	440
F612HX/F617HX-14	14	2,332	466	2,332	466	1,660	332	1,320	264	1,270	152	1,320	264	2,130	426
F612HX/F617HX-15	15	2,160	432	2,160	432	1,605	321	1,275	255	1,230	148	1,275	255	2,060	412
F612HX/F617HX-16	16	1,990	398	1,990	398	1,550	310	1,230	246	1,190	143	1,230	246	1,990	398
F612HX/F617HX-17	17	1,890	378	1,890	378	1,475	295	1,160	232	1,130	136	1,160	232	1,890	378
F612HX/F617HX-18	18	1,790	394	1,790	394	1,400	308	1,100	242	1,070	128	1,100	242	1,790	394
F612HX/F617HX-19	19	1,690	406	1,690	406	1,320	317	1,040	250	1,010	121	1,040	250	1,690	406
F612HX/F617HX-20	20	1,590	445	1,590	445	1,240	347	985	276	950	114	985	276	1,590	445
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D	

※ Notice: 617HX is Long Length series End Mills. Please adjust the parameter according

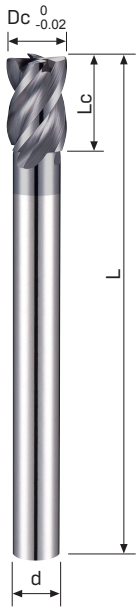
※ 注意617HX為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

E148HX 超微粒鎢鋼塗層多用途立銑刀 · 細柄短型

Multipurpose End Mills · Slim Shank · Short Type

Code No. E148HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E148HX
6	9	60	5	●
7	10.5	70	6	●
8	12	75	6	●
9	13.5	80	8	●
10	15	80	8	●
11	16.5	100	10	●
12	18	100	10	●
13	19.5	100	12	●
14	21	110	12	●
15	22.5	110	14	●
16	24	110	14	●
17	22.5	110	16	●
18	27	125	16	●
19	28.5	125	18	●
20	30	125	18	●
22	33	125	20	●

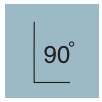


Steel < 48HRC

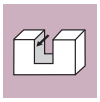
P	H	M	K	N	S
●	●	●	●		○

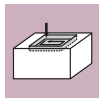
MG Carbide

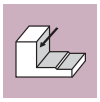
AlTiCrN HX

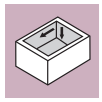


Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

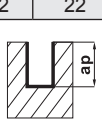
E148HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		130		130		120		100		60		70		130		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E148HX-6	6	6,897	1,150	6,897	1,150	6,366	991	5,308	620	3,715	267	4,246	572	6,897	1,150	1,592	100
E148HX-7	7	5,911	1,150	5,911	1,150	5,457	994	4,550	621	3,185	268	3,640	535	5,911	1,150	1,364	100
E148HX-8	8	5,173	1,150	5,173	1,150	4,775	994	3,981	621	2,787	268	3,185	535	5,173	1,150	1,194	100
E148HX-9	9	4,598	1,150	4,598	1,150	4,244	991	3,539	619	2,477	267	2,831	533	4,598	1,150	1,061	100
E148HX-10	10	4,138	1,150	4,138	1,150	3,820	994	3,185	573	2,229	268	2,548	535	4,138	1,150	955	100
E148HX-11	11	3,762	1,100	3,762	1,100	3,472	942	2,895	543	2,027	254	2,316	507	3,762	1,100	868	100
E148HX-12	12	3,448	1,050	3,448	1,050	3,183	891	2,654	557	1,858	240	2,123	480	3,448	1,050	796	90
E148HX-13	13	3,183	1,000	3,183	1,000	2,938	875	2,450	547	1,715	236	1,960	471	3,183	1,000	735	90
E148HX-14	14	2,956	980	2,956	980	2,728	867	2,275	542	1,592	233	1,820	467	2,956	980	682	85
E148HX-15	15	2,759	960	2,759	960	2,546	851	2,123	532	1,486	258	1,699	458	2,759	960	637	100
E148HX-16	16	2,586	950	2,586	950	2,387	845	1,990	528	1,393	256	1,592	455	2,586	950	597	100
E148HX-17	17	2,434	940	2,434	940	2,247	828	1,873	518	1,311	251	1,499	446	2,434	940	562	95
E148HX-18	18	2,299	920	2,299	920	2,122	810	1,769	509	1,238	245	1,415	436	2,299	920	531	95
E148HX-19	19	2,178	910	2,178	910	2,010	808	1,676	505	1,173	245	1,341	435	2,178	910	503	95
E148HX-20	20	2,069	900	2,069	900	1,910	802	1,592	501	1,115	245	1,274	432	2,069	900	477	95
E148HX-22	22	1,881	820	1,881	820	1,736	729	1,448	455	1,013	221	1,158	392	1,881	820	434	90
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.2D		ae:0.05D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		130		130		120		100		70		80		130		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E148HX-6	6	6,897	1,000	6,897	1,000	6,366	828	5,038	478	3,715	223	4,246	350	6,897	1,000	1,592	85
E148HX-7	7	5,911	1,000	5,911	1,000	5,457	831	4,550	479	3,185	224	3,640	352	5,911	1,000	1,364	85
E148HX-8	8	5,173	950	5,173	950	4,775	828	3,981	478	2,787	223	3,185	350	5,173	950	1,194	85
E148HX-9	9	4,598	950	4,598	950	4,244	827	3,539	477	2,477	223	2,831	350	4,598	950	1,061	85
E148HX-10	10	4,138	950	4,138	950	3,820	833	3,185	481	2,229	224	2,548	353	4,138	950	955	90
E148HX-11	11	3,762	900	3,762	900	3,472	786	2,895	454	2,027	212	2,316	333	3,762	900	868	85
E148HX-12	12	3,448	860	3,448	860	3,183	747	2,654	431	1,858	226	2,123	316	3,448	860	796	90
E148HX-13	13	3,183	840	3,183	840	2,938	729	2,450	420	1,715	221	1,960	308	3,183	840	735	90
E148HX-14	14	2,956	820	2,956	820	2,728	722	2,275	416	1,592	219	1,820	305	2,956	820	682	90
E148HX-15	15	2,759	810	2,759	810	2,546	707	2,123	408	1,486	214	1,699	299	2,759	810	637	85
E148HX-16	16	2,586	800	2,586	800	2,387	701	1,990	404	1,393	236	1,592	296	2,586	800	597	90
E148HX-17	17	2,434	780	2,434	780	2,247	687	1,873	396	1,311	231	1,499	290	2,434	780	562	90
E148HX-18	18	2,299	770	2,299	770	2,122	677	1,769	391	1,238	228	1,415	286	2,299	770	531	90
E148HX-19	19	2,178	760	2,178	760	2,010	671	1,676	387	1,173	226	1,341	284	2,178	760	503	92
E148HX-20	20	2,069	750	2,069	750	1,910	649	1,592	375	1,115	240	1,274	275	2,069	750	477	90
E148HX-22	22	1,881	670	1,881	670	1,736	590	1,448	340	1,013	218	1,158	250	1,881	670	434	85
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.5D		ap:0.5D		ap:0.3D	

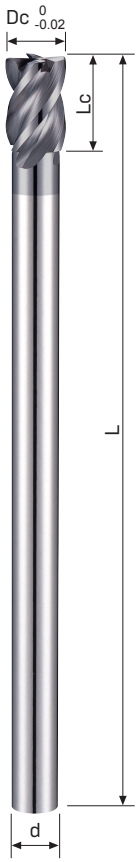
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

E149HX 超微粒鎢鋼塗層多用途立銑刀 · 細柄長型

Multipurpose End Mills · Slim Shank · Long Type

Code No. E149HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiCrN E149HX
6	9	120	5	●
7	10.5	135	6	●
8	12	135	6	●
9	13.5	135	8	●
10	15	150	8	●
11	16.5	160	10	●
12	18	160	10	●
13	19.5	160	12	●
14	21	160	12	●
15	22.5	180	14	●
16	24	180	14	●
17	22.5	180	16	●
18	27	180	16	●
19	28.5	200	18	●
20	30	200	18	●
22	33	200	20	●



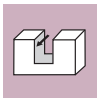
Steel < 48HRC

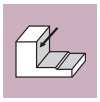
P	H	M	K	N	S
●	●	●	●		○

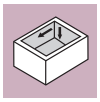
MG Carbide

AlTiCrN HX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

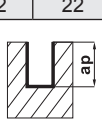
E149HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		130		130		120		100		70		80		130		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E149HX-6	6	6,897	700	6,897	700	6,366	595	5,308	372	3,715	160	4,246	343	6,897	700	1,592	55
E149HX-7	7	5,911	700	5,911	700	5,457	596	4,550	373	3,185	161	3,640	321	5,911	700	1,364	55
E149HX-8	8	5,173	700	5,173	700	4,775	596	3,981	373	2,787	161	3,185	321	5,173	700	1,194	55
E149HX-9	9	4,598	700	4,598	700	4,244	594	3,539	372	2,477	160	2,831	320	4,598	700	1,061	55
E149HX-10	10	4,138	700	4,138	700	3,820	596	3,185	344	2,229	161	2,548	321	4,138	700	955	55
E149HX-11	11	3,762	650	3,762	650	3,472	565	2,895	326	2,027	152	2,316	304	3,762	650	868	50
E149HX-12	12	3,448	650	3,448	650	3,183	535	2,654	334	1,858	144	2,123	288	3,448	650	796	50
E149HX-13	13	3,183	620	3,183	620	2,938	525	2,450	328	1,715	141	1,960	283	3,183	620	735	50
E149HX-14	14	2,956	600	2,956	600	2,728	520	2,275	325	1,592	140	1,820	280	2,956	600	682	50
E149HX-15	15	2,759	600	2,759	600	2,546	511	2,123	319	1,486	155	1,699	275	2,759	600	637	60
E149HX-16	16	2,586	580	2,586	580	2,387	507	1,990	317	1,393	153	1,592	273	2,586	580	597	60
E149HX-17	17	2,434	570	2,434	570	2,247	497	1,873	311	1,311	150	1,499	268	2,434	570	562	57
E149HX-18	18	2,299	560	2,299	560	2,122	486	1,769	304	1,238	147	1,415	262	2,299	560	531	55
E149HX-19	19	2,178	560	2,178	560	2,010	485	1,676	303	1,173	147	1,341	261	2,178	560	503	55
E149HX-20	20	2,069	540	2,069	540	1,910	481	1,592	301	1,115	146	1,274	259	2,069	540	477	55
E149HX-22	22	1,881	500	1,881	500	1,736	437	1,448	273	1,013	132	1,158	235	1,881	500	434	50
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.05D		ae:0.1D		ae:0.2D		ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		130		130		120		100		70		80		130		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E149HX-6	6	6,897	550	6,897	550	6,366	414	5,308	239	3,715	111	4,246	175	6,897	550	1,592	45
E149HX-7	7	5,911	540	5,911	540	5,457	415	4,550	240	3,185	112	3,640	176	5,911	540	1,364	45
E149HX-8	8	5,173	530	5,173	530	4,775	414	3,981	239	2,787	111	3,185	175	5,173	530	1,194	45
E149HX-9	9	4,598	510	4,598	510	4,244	414	3,539	239	2,477	111	2,831	175	4,598	510	1,061	40
E149HX-10	10	4,138	500	4,138	500	3,820	417	3,185	240	2,229	112	2,548	176	4,138	500	955	40
E149HX-11	11	3,762	480	3,762	480	3,472	393	2,895	227	2,027	106	2,316	166	3,762	480	868	40
E149HX-12	12	3,448	460	3,448	460	3,183	374	2,654	216	1,858	113	2,123	158	3,448	460	796	40
E149HX-13	13	3,183	440	3,183	440	2,938	364	2,450	210	1,715	110	1,960	154	3,183	440	735	40
E149HX-14	14	2,956	420	2,956	420	2,728	361	2,275	208	1,592	109	1,820	153	2,956	420	682	40
E149HX-15	15	2,759	400	2,759	400	2,546	353	2,123	204	1,486	107	1,699	149	2,759	400	637	40
E149HX-16	16	2,586	400	2,586	400	2,387	350	1,990	202	1,393	118	1,592	148	2,586	400	597	45
E149HX-17	17	2,434	400	2,434	400	2,247	343	1,873	198	1,311	116	1,499	145	2,434	400	562	45
E149HX-18	18	2,299	390	2,299	390	2,122	339	1,769	195	1,238	114	1,415	143	2,299	390	531	45
E149HX-19	19	2,178	390	2,178	390	2,010	335	1,676	193	1,173	113	1,341	142	2,178	390	503	45
E149HX-20	20	2,069	380	2,069	380	1,910	325	1,592	187	1,115	120	1,274	137	2,069	380	477	45
E149HX-22	22	1,881	350	1,881	350	1,736	295	1,448	170	1,013	109	1,158	125	1,881	350	434	40
切入深度 (mm) 		ap:0.3D		ap:0.3D		ap:0.3D		ap:0.2D		ap:0.05D		ap:0.2D		ap:0.3D		ap:0.2D	

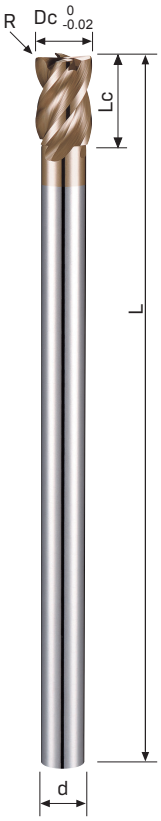
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

B270TX 極超微粒鎢鋼塗層多用途R角立銑刀

Multipurpose End Mills With Corner Radius

Code No. B270TX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiSiN B270TX
10	R0.5	15	130	8	●
10	R1	15	130	8	●
12	R0.5	18	150	10	●
12	R1	18	150	10	●
14	R0.5	21	160	12	●
14	R1	21	160	12	●
18	R0.5	27	180	16	●
18	R1	27	180	16	●
22	R0.5	33	200	20	●
22	R1	33	200	20	●



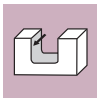
Steel < 60HRC

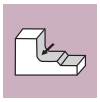
P	H	M	K	N	S
●	●		○		

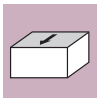
UMG Carbide

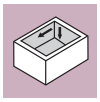
AlTiSiN TX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Cavity machining 型腔加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.6 硬化鋼 Hardened Steel （48~56HRC）		GR.7 硬化鋼 Hardened Steel （56~68HRC）	
切削速度 Vc m/min		200		200		200		150		150		120		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B270TX-10	10	6,400	1,300	6,400	1,300	6,400	1,100	4,800	800	4,800	700	3,800	320	3,180	250
B270TX-12	12	5,300	1,300	5,300	1,300	5,300	1,100	4,000	800	4,000	700	3,200	320	2,650	250
B270TX-14	14	4,550	1,300	4,550	1,300	4,550	1,100	3,400	800	3,400	700	2,750	320	2,270	250
B270TX-18	18	3,500	1,300	3,500	1,300	3,500	1,100	2,650	800	2,650	700	2,150	320	1,750	250
B270TX-22	22	2,900	1,300	2,900	1,300	2,900	1,050	2,180	750	2,180	700	1,750	320	1,450	250
切入深度 （mm） 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.05D		ap:0.02D	
		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.2D		ae:0.2D	

※ The above parameters is recommended in the range of 4XD extended length.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※ 以上參數建議在伸出長度4XD以內的況下使用。

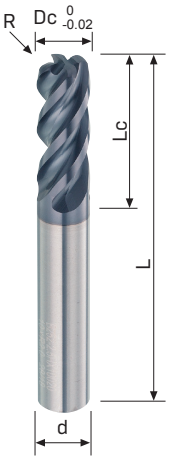
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B252-2.5HX 極超微粒鎢鋼塗層多用途R角立銑刀

Multipurpose End Mills With Corner Radius

Code No. B252-2.5HX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	AlTiCrN B252-2.5HX
1	R0.1	2.5	50	4	●
1	R0.2	2.5	50	4	●
1	R0.3	2.5	50	4	●
1.5	R0.1	3.75	50	4	●
1.5	R0.2	3.75	50	4	●
1.5	R0.3	3.75	50	4	●
2	R0.1	5	50	4	●
2	R0.2	5	50	4	●
2	R0.3	5	50	4	●
2	R0.5	5	50	4	●
2.5	R0.1	6.25	50	4	●
2.5	R0.2	6.25	50	4	●
2.5	R0.3	6.25	50	4	●
2.5	R0.5	6.25	50	4	●
3	R0.1	7.5	50	6	●
3	R0.2	7.5	50	6	●
3	R0.3	7.5	50	6	●
3	R0.4	7.5	50	6	●
3	R0.5	7.5	50	6	●
4	R0.1	10	50	6	●
4	R0.2	10	50	6	●
4	R0.3	10	50	6	●
4	R0.4	10	50	6	●
4	R0.5	10	50	6	●
4	R1	10	50	6	●
5	R0.2	12.5	50	6	●
5	R0.3	12.5	50	6	●
5	R0.4	12.5	50	6	●
5	R0.5	12.5	50	6	●
5	R1	12.5	50	6	●
6	R0.2	15	50	6	●
6	R0.3	15	50	6	●
6	R0.4	15	50	6	●
6	R0.5	15	50	6	●
6	R0.8	15	50	6	●
6	R1	15	50	6	●
6	R1.2	15	50	6	●
6	R1.5	15	50	6	●
6	R1.6	15	50	6	●
6	R2	15	50	6	●
7	R0.2	17.5	60	8	●
7	R0.3	17.5	60	8	●
7	R0.4	17.5	60	8	●
7	R0.5	17.5	60	8	●
7	R1	17.5	60	8	●
8	R0.2	20	60	8	●
8	R0.3	20	60	8	●
8	R0.4	20	60	8	●
8	R0.5	20	60	8	●
8	R0.8	20	60	8	●
8	R1	20	60	8	●
8	R1.2	20	60	8	●
8	R1.5	20	60	8	●
8	R1.6	20	60	8	●
8	R2	20	60	8	●
8	R3	20	60	8	●
9	R0.2	22.5	72	10	●
9	R0.3	22.5	72	10	●
9	R0.4	22.5	72	10	●
9	R0.5	22.5	72	10	●
9	R1	22.5	72	10	●
10	R0.2	25	72	10	●
10	R0.3	25	72	10	●
10	R0.4	25	72	10	●
10	R0.5	25	72	10	●
10	R0.8	25	72	10	●
10	R1	25	72	10	●
10	R1.2	25	72	10	●
10	R1.5	25	72	10	●
10	R1.6	25	72	10	●
10	R2	25	72	10	●
10	R3	25	72	10	●
11	R0.2	27.5	75	12	●
11	R0.3	27.5	75	12	●
11	R0.4	27.5	75	12	●
11	R0.5	27.5	75	12	●
11	R1	27.5	75	12	●
12	R0.2	30	75	12	●
12	R0.3	30	75	12	●
12	R0.4	30	75	12	●
12	R0.5	30	75	12	●
12	R0.8	30	75	12	●
12	R1	30	75	12	●
12	R1.2	30	75	12	●
12	R1.5	30	75	12	●
12	R1.6	30	75	12	●
12	R2	30	75	12	●
12	R3	30	75	12	●
13	R0.5	32.5	100	16	●
13	R1	32.5	100	16	●
13	R1.5	32.5	100	16	●
13	R2	32.5	100	16	●
13	R3	32.5	100	16	●
14	R0.5	35	100	16	●
14	R1	35	100	16	●
14	R1.5	35	100	16	●
14	R2	35	100	16	●
14	R3	35	100	16	●
15	R0.5	37.5	100	16	●
15	R1	37.5	100	16	●
15	R1.5	37.5	100	16	●
15	R2	37.5	100	16	●
15	R3	37.5	100	16	●
16	R0.5	40	100	16	●
16	R1	40	100	16	●
16	R1.5	40	100	16	●
16	R2	40	100	16	●
16	R3	40	100	16	●
16	R4	40	100	16	●
17	R0.5	42.5	100	20	●
17	R1	42.5	100	20	●
17	R1.5	42.5	100	20	●
17	R2	42.5	100	20	●
17	R3	42.5	100	20	●
18	R0.5	45	100	20	●
18	R1	45	100	20	●
18	R1.5	45	100	20	●
18	R2	45	100	20	●
18	R3	45	100	20	●
19	R0.5	47.5	100	20	●
19	R1	47.5	100	20	●
19	R1.5	47.5	100	20	●
19	R2	47.5	100	20	●
19	R3	47.5	100	20	●
20	R0.5	50	100	20	●
20	R1	50	100	20	●
20	R1.5	50	100	20	●
20	R2	50	100	20	●
20	R3	50	100	20	●
20	R4	50	100	20	●
20	R5	50	100	20	●



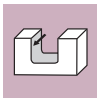
Steel < 56HRC

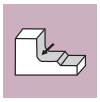
P	H	M	K	N	S
●	●	●	●		●

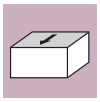
UMG Carbide

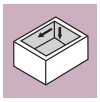
AlTiCrN HX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
	GR16	鎳 Nickel	●
	GR17	耐熱鋼 Heat-resistant Steel	●

B252-2.5HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.8 不鏽鋼 Stainless Stell		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~2.5 75~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 15~25 Ø3.0~20 25~35	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B252-2.5HX-1	1	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	25,000	350	20,000	240	7,100	50
B252-2.5HX-1.5	1.5	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	16,500	375	13,500	245	5,100	100
B252-2.5HX-2	2	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	12,500	390	13,000	300	4,000	120
B252-2.5HX-2.5	2.5	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	10,000	400	10,000	320	3,200	150
B252-2.5HX-3	3	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	8,500	400	8,800	500	3,200	180
B252-2.5HX-4	4	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	6,500	440	6,600	530	2,400	180
B252-2.5HX-5	5	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	5,200	460	5,300	600	2,000	190
B252-2.5HX-6	6	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,300	460	4,500	610	1,600	190
B252-2.5HX-7	7	3,800	600	3,200	425	3,200	425	2,500	145	1,200	70	3,650	460	3,800	600	1,400	180
B252-2.5HX-8	8	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,200	460	3,300	590	1,200	170
B252-2.5HX-9	9	2,900	590	2,500	425	2,500	425	2,000	145	1,000	65	2,850	460	2,900	590	1,100	165
B252-2.5HX-10	10	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	460	2,600	580	1,000	160
B252-2.5HX-11	11	2,400	580	2,000	420	2,000	420	1,600	140	850	60	2,350	440	2,400	580	900	160
B252-2.5HX-12	12	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,150	410	2,200	580	800	160
B252-2.5HX-13	13	2,000	560	1,700	410	1,700	410	1,350	140	700	55	2,000	400	2,000	570	750	160
B252-2.5HX-14	14	1,900	550	1,600	410	1,600	410	1,250	130	650	55	1,820	400	1,850	560	700	160
B252-2.5HX-15	15	1,700	540	1,500	400	1,500	400	1,250	130	600	50	1,700	400	1,700	540	650	150
B252-2.5HX-16	16	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	390	1,600	530	600	150
B252-2.5HX-17	17	1,500	520	1,250	390	1,250	390	1,100	120	550	45	1,500	390	1,500	530	550	150
B252-2.5HX-18	18	1,450	520	1,200	390	1,200	390	1,000	120	520	40	1,450	380	1,450	520	500	150
B252-2.5HX-19	19	1,350	520	1,150	380	1,150	380	950	115	500	40	1,350	380	1,400	510	530	150
B252-2.5HX-20	20	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	370	1,300	510	480	140
切入深度 (mm) 		ap:1.5D ae:＜3 0.05D ≥3 0.1D		ap:1.5D ae:＜3 0.05D ≥3 0.1D		ap:1.5D ae:＜3 0.05D ≥3 0.1D		ap:1.5D ae:＜3 0.05D ≥3 0.1D		ap:1.5D ae:0.02D		ap:1.0D ae:0.05D		ap:1.5D ae:＜3 0.05D ≥3 0.1D		ap:1.0 ae:＜3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

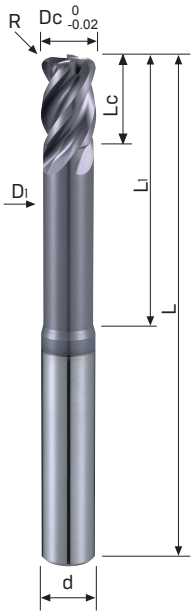
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B274HX 極超微粒鎢鋼塗層多用途R角立銑刀

Multipurpose End Mills With Corner Radius

Code No. B274HX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	AlTiCrN B274HX
1	0.1	1.5	60	6	5	0.95	●
1	0.2	1.5	60	6	5	0.95	●
1.5	0.1	2.3	60	6	7.5	1.45	●
1.5	0.2	2.3	60	6	7.5	1.45	●
2	0.1	3	60	6	10	1.95	●
2	0.2	3	60	6	10	1.95	●
2	0.5	3	60	6	10	1.95	●
2.5	0.1	3.8	60	6	12.5	2.4	●
2.5	0.2	3.8	60	6	12.5	2.4	●
2.5	0.5	3.8	60	6	12.5	2.4	●
3	0.1	4.5	70	6	15	2.8	●
3	0.2	4.5	70	6	15	2.8	●
3	0.5	4.5	70	6	15	2.8	●
4	0.1	6	70	6	20	3.7	●
4	0.2	6	70	6	20	3.7	●
4	0.5	6	70	6	20	3.7	●
4	1	6	70	6	20	3.7	●
5	0.2	7.5	70	6	25	4.6	●
5	0.5	7.5	70	6	25	4.6	●
5	1	7.5	70	6	25	4.6	●
6	0.2	9	70	6	30	5.5	●
6	0.3	9	70	6	30	5.5	●
6	0.5	9	70	6	30	5.5	●
6	1	9	70	6	30	5.5	●
6	1.5	9	70	6	30	5.5	●
6	2	9	70	6	30	5.5	●
8	0.2	12	80	8	40	7.4	●
8	0.3	12	80	8	40	7.4	●
8	0.5	12	80	8	40	7.4	●
8	1	12	80	8	40	7.4	●
8	1.5	12	80	8	40	7.4	●
8	2	12	80	8	40	7.4	●
8	3	12	80	8	40	7.4	●
10	0.2	15	95	10	50	9.2	●
10	0.3	15	95	10	50	9.2	●
10	0.5	15	95	10	50	9.2	●
10	1	15	95	10	50	9.2	●
10	1.5	15	95	10	50	9.2	●
10	2	15	95	10	50	9.2	●
10	3	15	95	10	50	9.2	●
12	0.2	18	110	12	60	11	●
12	0.3	18	110	12	60	11	●
12	0.5	18	110	12	60	11	●
12	1	18	110	12	60	11	●
12	1.5	18	110	12	60	11	●
12	2	18	110	12	60	11	●
12	3	18	110	12	60	11	●
16	0.5	24	140	16	80	14.5	●
16	1	24	140	16	80	14.5	●
16	1.5	24	140	16	80	14.5	●
16	2	24	140	16	80	14.5	●
16	3	24	140	16	80	14.5	●
20	0.5	30	160	20	100	18.2	●
20	1	30	160	20	100	18.2	●
20	1.5	30	160	20	100	18.2	●
20	2	30	160	20	100	18.2	●
20	3	30	160	20	100	18.2	●
20	5	30	160	20	100	18.2	●



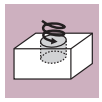
Steel < 56HRC

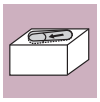
P	H	M	K	N	S
●	●	●	●		●

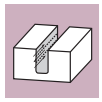
UMG Carbide

AlTiCrN HX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
	GR16	鎳 Nickel	●
	GR17	耐熱鋼 Heat-resistant Steel	●

B274HX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.8 不鏽鋼 Stainless Stell		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 55~65 Ø3.0~20 60~70		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 30~35 Ø3.0~0 35~40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B274HX-1	1	20,000	240	20,000	240	15,000	215	15,000	215	10,000	85	7,100	40	17,500	250	20,000	240	9,550	136
B274HX-1.5	1.5	13,500	245	13,500	245	12,000	215	12,000	215	8,000	90	5,100	50	11,600	250	13,500	245	6,366	115
B274HX-2	2	13,000	300	13,000	300	11,000	280	11,000	280	7,000	110	3,900	60	8,750	263	13,000	300	4,775	122
B274HX-2.5	2.5	10,000	320	10,000	320	9,000	300	9,000	300	6,000	120	3,000	60	7,000	275	10,000	320	3,820	127
B274HX-3	3	8,800	500	8,800	500	7,200	350	7,200	350	5,300	125	2,700	60	6,370	361	8,800	500	3,714	181
B274HX-4	4	6,600	530	6,600	530	5,500	360	5,500	360	4,200	130	2,200	70	4,770	365	6,600	530	2,785	182
B274HX-5	5	5,300	600	5,300	600	4,350	420	4,350	420	3,500	140	1,900	75	3,800	430	5,300	600	2,228	215
B274HX-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	3,185	426	4,500	610	1,857	213
B274HX-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	2,390	438	3,300	590	1,392	219
B274HX-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	1,910	425	2,600	580	1,114	213
B274HX-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	1,590	433	2,200	580	928	216
B274HX-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,195	428	1,600	530	696	214
B274HX-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	955	374	1,300	510	557	187
切入深度 (mm)		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae: 0.05D		ae:0.05D		ae:0.02D		ae: 0.05D		ae: 0.05D		ae: 0.05D	

High feed cutting 高進給切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.8 不鏽鋼 Stainless Stell		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 47~70 Ø3.0~20 70~75		Ø1.0~1.5 47~57 Ø1.5~20 57~70		Ø1.0~2.5 30~47 Ø3.0~20 50~60		Ø1.0~20 22~30		Ø1.0~2.5 80~100 Ø3.0~20 130~150		Ø1.0~2.5 60~80 Ø3.0~20 80~85		Ø1.0~2.5 60~80 Ø3~20 80~85	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B274HX-1	1	32,000	1,280	32,000	1,280	26,000	1,040	26,000	1,040	20,000	800	20,000	800	25,400	1,016	32,000	1,280	19,100	760
B274HX-1.5	1.5	22,000	1,760	22,000	1,760	17,000	1,360	17,000	1,360	13,000	1,040	13,000	1,040	16,800	1,344	22,000	1,760	12,732	1,018
B274HX-2	2	16,000	1,920	16,000	1,920	14,000	1,680	14,000	1,680	10,000	1,200	10,000	1,200	12,700	1,524	16,000	1,920	9,550	1,146
B274HX-2.5	2.5	14,000	2,240	14,000	2,240	12,000	1,920	12,000	1,920	9,000	1,440	9,000	1,440	10,185	1,629	14,000	2,240	7,640	1,222
B274HX-3	3	13,000	2,600	13,000	2,600	10,500	2,100	10,500	2,100	8,500	1,700	8,500	1,700	13,793	2,758	13,000	2,600	8,488	1,698
B274HX-4	4	12,000	2,880	12,000	2,880	10,000	2,400	10,000	2,400	8,500	2,040	8,500	2,040	10,345	2,482	12,000	2,880	6,366	1,528
B274HX-5	5	9,500	2,660	9,500	2,660	8,500	2,380	8,500	2,380	7,000	1,960	7,000	1,960	8,276	2,317	9,500	2,660	5,093	1,426
B274HX-6	6	8,000	2,560	8,000	2,560	7,500	2,400	7,500	2,400	6,500	2,080	6,500	2,080	6,897	2,207	8,000	2,560	4,244	1,358
B274HX-8	8	6,500	2,340	6,500	2,340	5,500	1,980	5,500	1,980	5,500	1,760	5,500	1,760	5,173	1,862	6,500	2,340	3,183	1,145
B274HX-10	10	5,500	2,200	5,500	2,200	4,800	1,920	4,800	1,920	4,000	1,440	4,000	1,440	4,138	1,655	5,500	2,200	2,546	1,018
B274HX-12	12	5,000	2,200	5,000	2,200	4,000	1,760	4,000	1,760	3,500	1,400	3,500	1,400	3,448	1,517	5,000	2,200	2,122	934
B274HX-16	16	4,000	1,920	4,000	1,920	3,000	1,440	3,000	1,440	2,500	1,000	2,500	1,000	2,586	1,241	4,000	1,920	1,592	764
B274HX-20	20	3,000	1,560	3,000	1,560	2,400	1,248	2,400	1,248	2,000	800	2,000	800	2,069	1,075	3,000	1,560	1,273	662
切入深度 (mm)		ap:0.3×R		ap:0.3×R		ap:0.3×R		ap:0.3×R		ap:0.2×R		ap:0.1×R		ap:0.3×R		ap:0.3×R		ap:0.3×R	
		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D		ae:0.3×D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

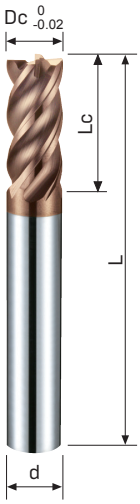
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F636TX 極超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. F636TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiSiN F636TX
3	8	57	6	●
4	11	57	6	●
5	13	57	6	●
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
16	32	92	16	●
20	38	104	20	●



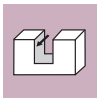
Steel < 60HRC

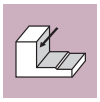
P	H	M	K	N	S
●	●	○	●		○

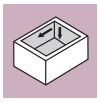
UMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

F636TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		80		65		60		55		50		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F636TX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	5,760	95	5,120	84	10,600	683
F636TX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,420	108	3,040	96	6,350	735
F636TX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,457	113	2,184	100	4,550	875
F636TX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	1,890	113	1,680	100	3,540	875
F636TX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,710	113	1,520	100	3,185	770
F636TX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,436	108	1,276	96	3,650	770
F636TX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,228	108	1,092	96	2,275	670
F636TX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,071	90	952	80	1,990	670
F636TX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	855	81	760	72	1,590	535
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.2D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		80		65		60		55		50		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F636TX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	5,760	95	5,120	84	10,600	600
F636TX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,420	108	3,040	96	6,350	635
F636TX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,457	113	2,184	100	4,550	775
F636TX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	1,890	113	1,680	100	3,540	775
F636TX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,710	113	1,520	100	3,185	650
F636TX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,436	108	1,276	96	3,650	670
F636TX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,228	108	1,092	96	2,275	560
F636TX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,071	90	952	80	1,990	660
F636TX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	855	81	760	72	1,590	500
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.05D		ap:0.05D		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

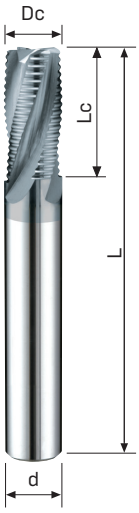
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F608HX / F609HX 極超微粒鎢鋼塗層粗加工立銑刀

Roughing End Mills

Code No. F608HX-Dc

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiCrN F608HX
3	8	57	6	3	0.3	●
4	11	57	6	3	0.3	●
5	13	57	6	3	0.4	●
6	13	57	6	3	0.4	●
8	19	63	8	3	0.4	●
10	22	72	10	4	0.5	●
12	26	83	12	4	0.5	●
14	26	83	14	4	0.5	●
16	32	92	16	4	0.5	●
18	32	92	18	4	0.5	●
20	38	104	20	4	0.5	●

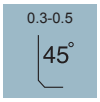


Steel < 48HRC

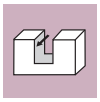
P	H	M	K	N	S
●	●	○	●		

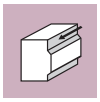
UMG Carbide

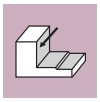
AlTiCrN HX

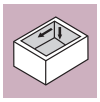


Type of Operation



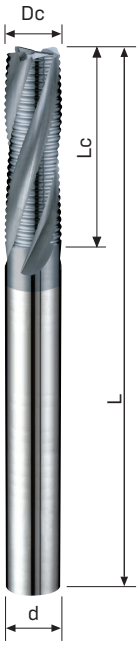






Code No. F609HX-Dc

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiCrN F609HX
6	19	63	6	3	0.4	●
8	28	72	8	3	0.4	●
10	34	84	10	4	0.5	●
12	40	97	12	4	0.5	●
16	48	108	16	4	0.5	●
20	56	122	20	4	0.5	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F608HX / F609HX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		100		80		65		140	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F608HX-3	3	10,600	1,270	10,600	1,270	9,000	720	6,900	550	5,300	254	12,740	1,020
F608HX-4	4	7,960	955	7,960	955	6,760	540	5,175	420	3,980	238	9,550	955
F608HX-5	5	6,370	764	6,370	764	5,410	432	4,140	330	3,180	216	7,640	764
F608HX/H609HX-6	6	5,300	620	5,300	620	4,500	350	3,400	260	2,600	200	6,300	730
F608HX/H609HX-8	8	4,000	620	4,000	620	3,400	400	2,600	300	2,000	220	4,700	750
F608HX/H609HX-10	10	3,200	630	3,200	630	2,700	420	2,000	320	1,600	250	3,800	750
F608HX/H609HX-12	12	2,600	630	2,600	630	2,200	430	1,700	320	1,350	260	3,200	750
F608HX-14	14	2,250	650	2,250	650	1,950	470	1,500	350	1,150	280	2,750	770
F608HX/H609HX-16	16	2,000	620	2,000	620	1,700	460	1,300	350	1,000	260	2,400	760
F608HX-18	18	1,750	630	1,750	630	1,500	480	1,150	350	900	270	2,100	750
F608HX/H609HX-20	20	1,600	600	1,600	600	1,400	450	1,100	340	790	250	1,900	760
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.4D		ae:0.4D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.4D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60		60		50		45		40		60	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F608HX-3	3	6,300	200	6,300	200	5,300	170	4,700	150	4,200	100	6,300	200
F608HX-4	4	4,700	250	4,700	250	3,980	200	3,500	160	3,180	120	4,700	250
F608HX-5	5	3,800	300	3,800	300	3,180	230	2,800	180	2,550	140	3,800	300
F608HX/H609HX-6	6	3,150	315	3,150	315	2,650	260	2,300	180	2,100	160	3,150	315
F608HX/H609HX-8	8	2,350	300	2,350	300	2,000	250	1,750	170	1,600	150	2,350	300
F608HX/H609HX-10	10	1,900	300	1,900	300	1,600	240	1,400	160	1,300	150	1,900	300
F608HX/H609HX-12	12	1,600	280	1,600	280	1,300	230	1,200	160	1,100	140	1,600	280
F608HX-14	14	1,350	280	1,350	280	1,100	235	1,000	150	900	130	1,350	280
F608HX/H609HX-16	16	1,200	270	1,200	270	1,000	225	900	140	800	120	1,200	270
F608HX-18	18	1,000	260	1,000	260	900	240	800	135	700	120	1,000	260
F608HX/H609HX-20	20	950	260	950	260	800	240	700	130	650	125	950	260
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D	

※ Note that when the end mills diameter less than 6 mm, please adjust proper parameters in accordance with the actual processing conditions.

※ Notice: F609HX is Long Length series End Mills. Please adjust the parameter according

※ 注意當銑刀直徑小於6毫米時候，請按照實際的加工情況調整合理的參數。

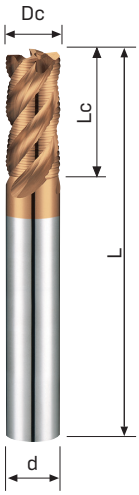
※ 注意F609HX為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

F638TX / F649TX 極超微粒鎢鋼塗層粗加工立銑刀

Roughing End Mills

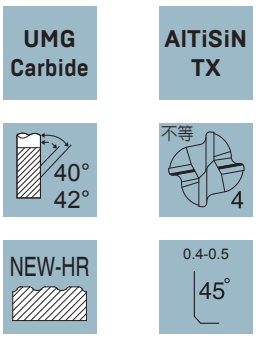
Code No. F638TX-Dc

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiSiN F638TX
6	13	57	6	4	0.4	●
8	19	63	8	4	0.4	●
10	22	72	10	4	0.5	●
12	26	83	12	4	0.5	●
14	26	83	14	4	0.5	●
16	32	92	16	4	0.5	●
18	32	92	18	4	0.5	●
20	38	104	20	4	0.5	●

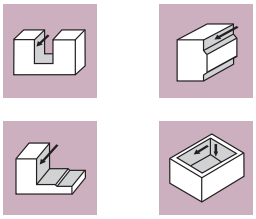


Steel < 56HRC

P	H	M	K	N	S
●	●	●	○		○

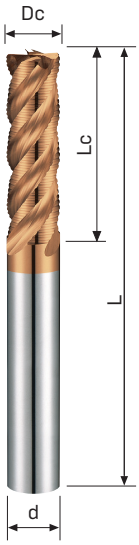


Type of Operation



Code No. F649TX-Dc

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiSiN F649TX
6	19	63	6	4	0.4	●
8	28	72	8	4	0.4	●
10	34	84	10	4	0.5	●
12	40	97	12	4	0.5	●
16	48	108	16	4	0.5	●
20	56	122	20	4	0.5	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

F638TX / F649TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		120		120		100		80		65		80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F638TX/F649TX-6	6	5,300	620	5,300	620	4,500	350	3,400	260	2,600	200	3,400	260
F638TX/F649TX-8	8	4,000	620	4,000	620	3,400	400	2,600	300	2,000	220	2,600	300
F638TX/F649TX-10	10	3,200	630	3,200	630	2,700	420	2,000	320	1,600	250	2,000	320
F638TX/F649TX-12	12	2,600	630	2,600	630	2,200	430	1,700	320	1,350	260	1,700	320
F638TX-14	14	2,250	650	2,250	650	1,950	470	1,500	350	1,150	280	1,500	350
F638TX/F649TX-16	16	2,000	620	2,000	620	1,700	460	1,300	350	1,000	260	1,300	350
F638TX-18	18	1,750	630	1,750	630	1,500	480	1,150	350	900	270	1,150	350
F638TX/F649TX-20	20	1,600	600	1,600	600	1,400	450	1,100	340	790	250	1,100	340
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.4D		ae:0.4D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		60		60		50		45		40		45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F638TX/F649TX-6	6	3,150	315	3,150	315	2,650	260	2,300	180	2,100	160	2,300	180
F638TX/F649TX-8	8	2,350	300	2,350	300	2,000	250	1,750	170	1,600	150	1,750	170
F638TX/F649TX-10	10	1,900	300	1,900	300	1,600	240	1,400	160	1,300	150	1,400	160
F638TX/F649TX-12	12	1,600	280	1,600	280	1,300	230	1,200	160	1,100	140	1,200	160
F638TX-14	14	1,350	280	1,350	280	1,100	235	1,000	150	900	130	1,000	150
F638TX/F649TX-16	16	1,200	270	1,200	270	1,000	225	900	140	800	120	900	140
F638TX-18	18	1,000	260	1,000	260	900	240	800	135	700	120	800	135
F638TX/F649TX-20	20	950	260	950	260	800	240	700	130	650	125	700	130
切入深度 (mm) 		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D	

※ Notice: F649TX is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※ 注意F649TX為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

不銹鋼，鈦合金用立銑刀
End Mills For Stainless, Titanium

Page	123	125	127	129	131
Apperance					
Code No	E129SX	E233SX	E234SX	E235-2.5SX E235-5.0SX	E236TX
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiSiN TX
Helix Angle	 20°	 38°~	 38°~	 38°~	 38°~
No.of Flutes	 4	不等  4	不等  5	不等  5	不等  7

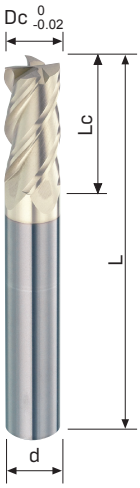
7leaders®
The Art of Cutting

E129SX 超微粒鎢鋼塗層不銹鋼立銑刀

End Mills for Stainless

Code No. E129SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN+ZrN E129SX
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3A	8	50	4	●
4A	11	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●



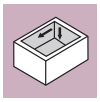
Stainless

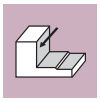
P	H	M	K	N	S
		●			●

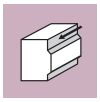
MG Carbide

AlTiN+ZrN SX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	●

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		65	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E129SX-1	1	11,100	385
E129SX-1.5	1.5	10,700	490
E129SX-2	2	10,300	600
E129SX-2.5	2.5	8,650	500
E129SX-3	3	7,000	400
E129SX-4	4	5,200	410
E129SX-5	5	4,100	410
E129SX-6	6	3,500	450
E129SX-8	8	2,600	460
E129SX-10	10	2,050	470
E129SX-12	12	1,800	500
切入深度 （mm） 		ap:1.5D ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

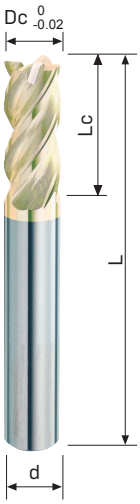
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E233SX 超微粒鎢鋼塗層不銹鋼用立銑刀

End Mills for Stainless

Code No. E233SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN+ZrN E233SX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●



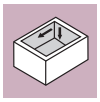
Stainless

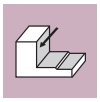
P	H	M	K	N	S
		●			●

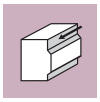
MG Carbide

AlTiN+ZrN SX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	●

E233SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		75	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E233SX-3	3	7,650	600
E233SX-4	4	6,050	700
E233SX-5	5	5,000	770
E233SX-6	6	4,200	830
E233SX-8	8	3,100	800
E233SX-10	10	2,600	710
E233SX-12	12	2,100	670
E233SX-16	16	1,600	550
E233SX-20	20	1,250	510
切入深度 （mm） 		ap:1.5D ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		70	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E233SX-3	3	7,450	450
E233SX-4	4	5,500	500
E233SX-5	5	4,500	530
E233SX-6	6	3,700	550
E233SX-8	8	2,800	525
E233SX-10	10	2,300	465
E233SX-12	12	1,850	430
E233SX-16	16	1,400	370
E233SX-20	20	1,100	330
切入深度 （mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E234SX 超微粒鎢鋼塗層不銹鋼用立銑刀

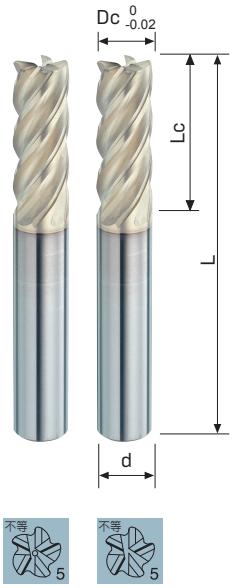
End Mills for Stainless

Code No. E234SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	AlTiN+ZrN E234SX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	22	72	10	●
12	26	75	12	●
16	38	100	16	●
20	38	100	20	●

※ Through coolant hole can be customized.

※內冷孔可依需求製造生產

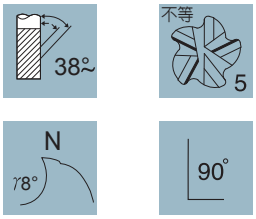


Stainless

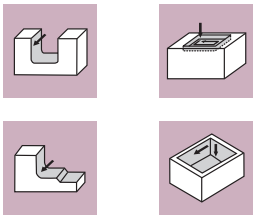
P	H	M	K	N	S
		●			●

MG Carbide

AlTiN+ZrN SX



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	●

E234SX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		75	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E234SX-3	3	7,650	720
E234SX-4	4	6,050	840
E234SX-5	5	5,000	920
E234SX-6	6	4,200	990
E234SX-8	8	3,100	960
E234SX-10	10	2,600	850
E234SX-12	12	2,100	800
E234SX-16	16	1,600	660
E234SX-20	20	1,250	615
切入深度 （mm） 		ap:1.5D	
		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E235-2.5SX / 5.0SX 超微粒鎢鋼塗層不銹鋼用R角立銑刀

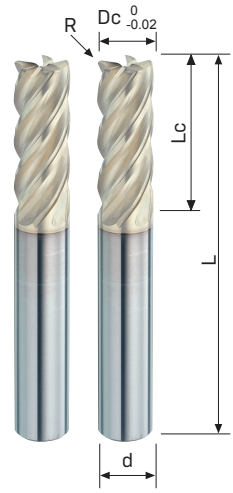
End Mills With Corner Radius for Stainless

Code No. E253-2.5SX-Dc×R

Dc $^{0}_{-0.02}$	R ±0.01	Lc mm	L mm	d h6	AlTiN+ZrN E235-2.5SX
6	0.5	15	50	6	●
8	0.5	20	60	8	●
10	0.5	25	72	10	●
12	0.5	30	75	12	●
16	0.5	40	100	16	●
20	0.5	50	100	20	●

※ Through coolant hole can be customized.

※內冷孔可依需求製造生產



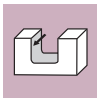
Stainless

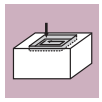
P	H	M	K	N	S
		●			●

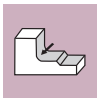
MG Carbide

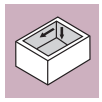
AlTiN+ZrN SX

Type of Operation







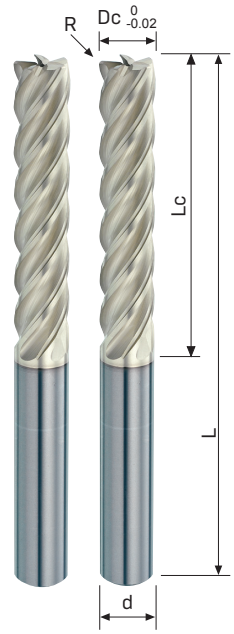


Code No. E253-5.0SX-Dc×R

Dc $^{0}_{-0.02}$	R ±0.01	Lc mm	L mm	d h6	AlTiN+ZrN E235-5.0SX
6	0.5	30	75	6	●
8	0.5	40	90	8	●
10	0.5	50	100	10	●
12	0.5	60	110	12	●
16	0.5	80	160	16	●
20	0.5	100	200	20	●

※ Through coolant hole can be customized.

※內冷孔可依需求製造生產



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	●

E235-2.5SX / 5.0SX 切削條件參考表

Recommended Milling Conditions

E235-2.5SX / Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		75	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E235-2.5SX-6	6	4,200	990
E235-2.5SX-8	8	3,100	960
E235-2.5SX-10	10	2,600	850
E235-2.5SX-12	12	2,100	800
E235-2.5SX-16	16	1,600	660
E235-2.5SX-20	20	1,250	615
切入深度 (mm) 		ap:1.5D	
		ae:0.1D	

E235-5.0SX / Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		75	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E235-2.5SX-6	6	2120	500
E235-2.5SX-8	8	1590	475
E235-2.5SX-10	10	1275	410
E235-2.5SX-12	12	1060	400
E235-2.5SX-16	16	800	300
E235-2.5SX-20	20	640	250
切入深度 (mm) 		ap:3.0D	
		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E236TX 超微粒鎢鋼塗層鈦合金用R角立銑刀

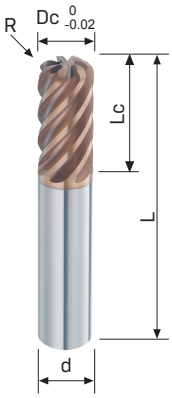
End Mills With Corner Radius for Titanium

Code No. E236TX-Dc×R

Dc $^{0}_{-0.02}$	R ±0.01	Lc mm	L mm	d h6	AlTiSiN E236TX
10	2	25	72	10	○
12	3	30	75	12	○
16	4	48	100	16	○
20	4	60	120	20	○

※Mark ○ : No stock. Price based on the quantity.
※Corner radius can be customized.

※無庫存 ○：依需求數量而報價
※R角可依需求製造生產



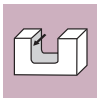
Titanium, Nickle

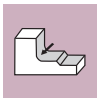
P	H	M	K	N	S
					●

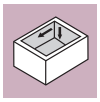
MG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
	GR16	鎳 Nickel	●
	GR17	耐熱鋼 Heat-resistant Steel	●

E236TX 切削條件參考表

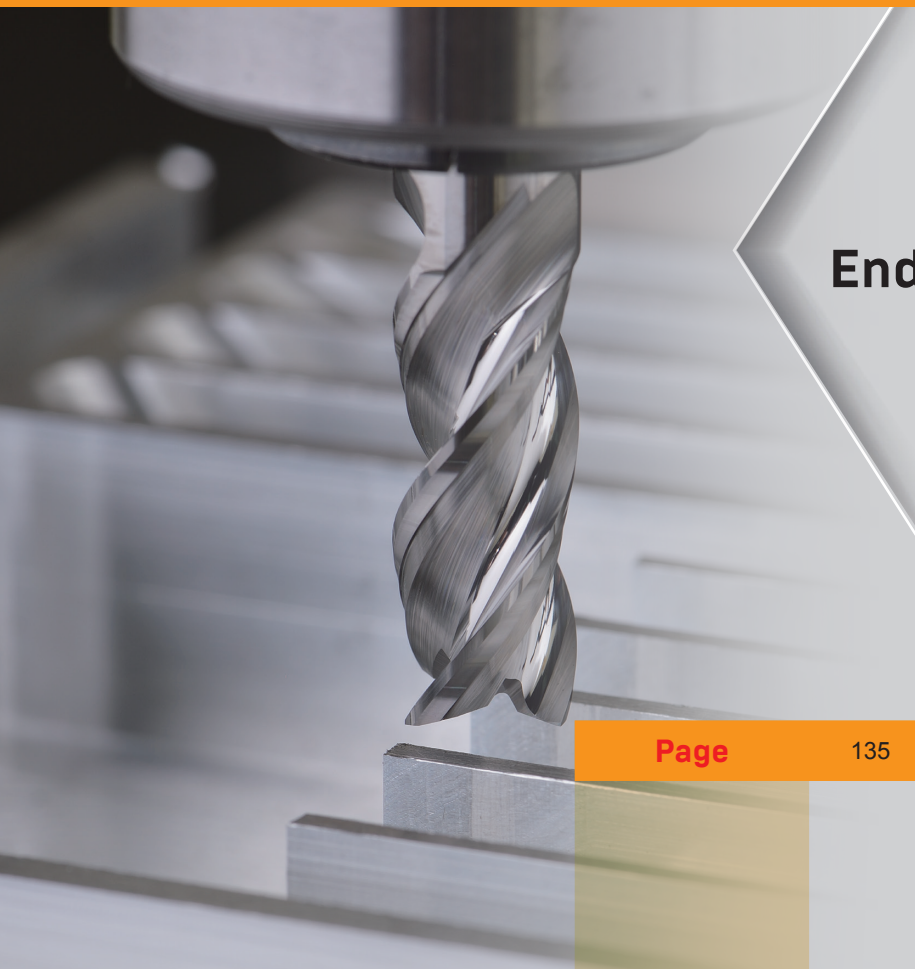
Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.15 鈦合金 Titanium		GR.16 鎳基合金 Nickel		GR.17 耐熱鋼 Heat-resistant Steel	
切削速度 Vc m/min		60		40		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E236TX-10	10	1,900	580	1,270	380	1,270	380
E236TX-12	12	1,060	630	1,060	290	1,060	290
E236TX-16	16	800	540	800	240	800	240
E236TX-20	20	630	520	630	225	630	225
切入深度 （mm） 		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



鋁用立銑刀
End Mills For Aluminium

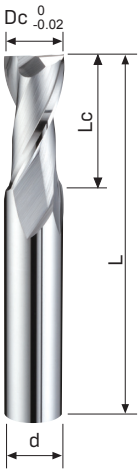
Page	135	137	139	141	143	145
Apperance						
Code No	E132 E134	E142	E143DX	E143	E143-3.0 E143-4.0 E143-5.0	E145
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Blank	Uncoated Blank	DLC DX	Uncoated Blank	Uncoated Blank	Uncoated Blank
Helix Angle	30°	40°	40≈	40≈	40≈	40≈
No.of Flutes	2	2	不等 3	不等 3	不等 3	不等 3

7leaders®
The Art of Cutting

147	149	149
		
E194	**E195R**	**E195L**
MG Carbide	**MG Carbide**	**MG Carbide**
Uncoated Blank	**Uncoated Blank**	**Uncoated Blank**
 40°	 30°	 30°
 Z	 1	 1

Code No. E132-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E132
1.0	3	50	4	●
1.5	5	50	4	●
2.0	6	50	4	●
2.5	8	50	4	●
3.0	8	50	6	●
4.0	11	50	6	●
5.0	13	50	6	●
6.0	16	50	6	●
8.0	20	60	8	●
10.0	22	72	10	●
12.0	26	75	12	●

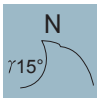


Aluminium

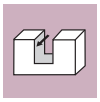
P	H	M	K	N	S
				●	

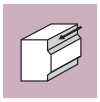
MG Carbide

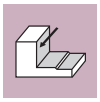
Uncoated Blank

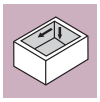


Type of Operation







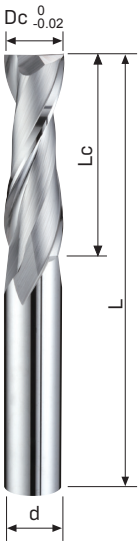


Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E134-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E134
3	12	50	6	●
4	17	50	6	●
5	20	60	6	●
6	20	60	6	●
8	28	70	8	●
10	34	80	10	●
12	40	90	12	●



Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E132-1	1	31,500	200
E132-1.5	1.5	21,000	200
E132-2	2	15,500	200
E132-2.5	2.5	13,000	250
E132/E134-3	3	10,500	300
E132/E134-4	4	8,000	300
E132/E134-5	5	6,350	300
E132/E134-6	6	5,300	300
E132/E134-8	8	4,000	300
E132/E134-10	10	3,200	300
E132/E134-12	12	2,650	300
切入深度 （mm） 		ap:1.0D	

※ Notice: E134 is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※ 注意E134為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

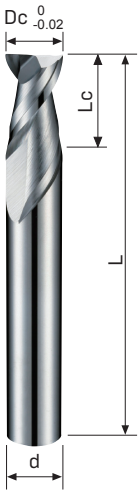
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E142 超微粒鎢鋼鋁用立銑刀

End Mills For Aluminium

Code No. E142-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E142
3	8	50	6	●
3.1	10	50	6	●
3.2	10	50	6	●
3.3	10	50	6	●
3.4	10	50	6	●
3.5	10	50	6	●
3.6	10	50	6	●
3.7	10	50	6	●
3.8	11	50	6	●
3.9	11	50	6	●
4	11	50	6	●
4.1	11	50	6	●
4.2	11	50	6	●
4.3	11	50	6	●
4.4	11	50	6	●
4.5	11	50	6	●
4.6	11	50	6	●
4.7	11	50	6	●
4.8	13	50	6	●
4.9	13	50	6	●
5	13	50	6	●
5.1	13	50	6	●
5.2	13	50	6	●
5.3	13	50	6	●
5.4	13	50	6	●
5.5	13	50	6	●
5.6	16	50	6	●
5.7	16	50	6	●
5.8	16	50	6	●
5.9	16	50	6	●
6	16	50	6	●
6.1	16	60	8	●
6.2	16	60	8	●
6.3	16	60	8	●
6.4	16	60	8	●
6.5	16	60	8	●
6.6	20	60	8	●
6.7	20	60	8	●
6.8	20	60	8	●
6.9	20	60	8	●
7	20	60	8	●
7.1	20	60	8	●
7.2	20	60	8	●
7.3	20	60	8	●
7.4	20	60	8	●
7.5	20	60	8	●
7.6	20	60	8	●
7.7	20	60	8	●
7.8	20	60	8	●
7.9	20	60	8	●
8	20	60	8	●
8.5	20	72	10	●
9	25	72	10	●
9.5	25	72	10	●
10	25	72	10	●
10.5	25	75	12	●
11	30	75	12	●
11.5	30	75	12	●
12	30	75	12	●



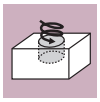
Aluminium

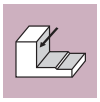
P	H	M	K	N	S
				●	

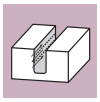
MG Carbide

Uncoated Blank

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		150~380	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E142-3	3	16,000	1,280
E142-3.5	3.5	14,000	1,120
E142-4	4	12,000	960
E142-4.5	4.5	10,800	1,240
E142-5	5	9,600	1,520
E142-5.5	5.5	8,800	1,400
E142-6	6	8,000	1,280
E142-6.5	6.5	7,500	1,200
E142-7	7	7,000	1,120
E142-7.5	7.5	6,500	1,040
E142-8	8	6,000	960
E142-8.5	8.5	7,500	1,120
E142-9	9	9,000	1,280
E142-9.5	9.5	10,500	1,440
E142-10	10	12,000	1,600
E142-10.5	10.5	11,500	1,600
E142-11	11	11,000	1,600
E142-11.5	11.5	10,500	1,600
E142-12	12	10,000	1,600
切入深度 （mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

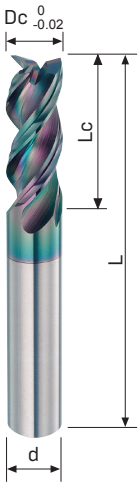
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E143DX 超微粒鎢鋼鑽石塗層強力鋁用立銑刀

End Mills For Aluminium

Code No. E143DX-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	DLC E143DX
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	72	10	●
12	30	75	12	●
16	40	100	16	●
20	40	100	20	●

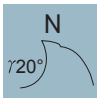


Aluminium

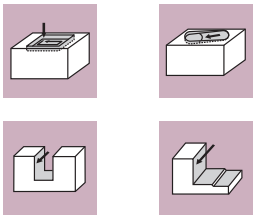
P	H	M	K	N	S
				●	

MG Carbide

DLC DX



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E143DX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E143DX-3	3	42,000	1,900
E143DX-4	4	31,000	2,200
E143DX-5	5	25,000	2,200
E143DX-6	6	21,000	2,400
E143DX-8	8	16,000	2,600
E143DX-10	10	12,700	3,000
E143DX-12	12	10,600	3,200
E143DX-14	14	9,100	3,200
E143DX-16	16	8,000	3,200
E143DX-20	20	6,300	3,100
切入深度 (mm) 		ap:1.5D ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E143DX-3	3	42,000	1,340
E143DX-4	4	31,000	1,400
E143DX-5	5	25,000	1,480
E143DX-6	6	21,000	1,640
E143DX-8	8	16,000	1,720
E143DX-10	10	12,700	1,940
E143DX-12	12	10,600	2,100
E143DX-14	14	9,100	2,100
E143DX-16	16	7,900	2,100
E143DX-20	20	6,300	2,100
切入深度 (mm) 		0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

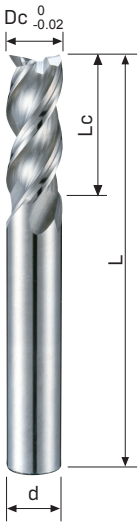
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E143 超微粒鎢鋼強力鋁用立銑刀

End Mills For Aluminium

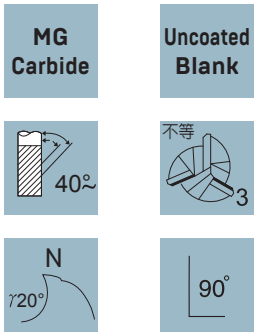
Code No. E143-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E143
1	3	50	4	●
1.5	5	50	4	●
2	6	50	4	●
2.5	8	50	4	●
3	8	50	6	●
4	11	50	6	●
5	13	50	6	●
6	16	50	6	●
8	20	60	8	●
10	25	72	10	●
12	30	75	12	●
14	35	100	16	●
16	40	100	16	●
18	40	100	20	●
20	40	100	20	●

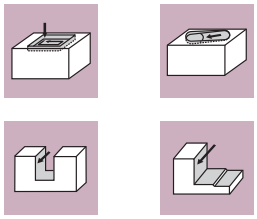


Aluminium

P	H	M	K	N	S
				●	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E143 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E143-1	1	63,000	1,890
E143-1.5	1.5	50,000	1,500
E143-2	2	45,000	1,755
E143-2.5	2.5	42,000	1,800
E143-3	3	42,000	1,900
E143-4	4	31,000	2,200
E143-5	5	25,000	2,200
E143-6	6	21,000	2,400
E143-8	8	16,000	2,600
E143-10	10	12,700	3,000
E143-12	12	10,600	3,200
E143-14	14	9,100	3,200
E143-16	16	8,000	3,200
E143-18	18	7,000	3,100
E143-20	20	6,300	3,100
切入深度 (mm) 		ap:1.5D ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E143-1	1	63,000	1,320
E143-1.5	1.5	50,000	1,050
E143-2	2	45,000	1,230
E143-2.5	2.5	42,000	1,260
E143-3	3	42,000	1,340
E143-4	4	31,000	1,400
E143-5	5	25,000	1,480
E143-6	6	21,000	1,640
E143-8	8	16,000	1,720
E143-10	10	12,700	1,940
E143-12	12	10,600	2,100
E143-14	14	9,100	2,100
E143-16	16	7,900	2,100
E143-18	18	7,000	2,100
E143-20	20	6,300	2,100
切入深度 (mm) 		0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

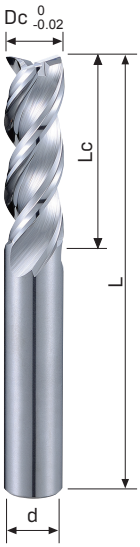
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E143-3.0 / 4.0 / 5.0 超微粒鎢鋼強力鋁用立銑刀

End Mills For Aluminium

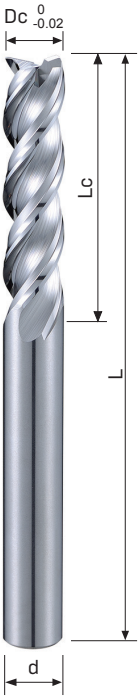
Code No. E143-3.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E143-3.0
3	9	50	6	●
4	12	50	6	●
5	15	50	6	●
6	18	50	6	●
8	24	65	8	●
10	30	75	10	●
12	36	80	12	●
16	48	100	16	●
20	60	120	20	●



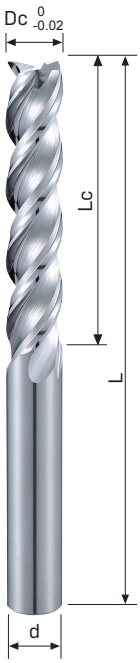
Code No. E143-4.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E143-4.0
3	12	50	6	●
4	16	55	6	●
5	20	60	6	●
6	24	65	6	●
8	32	90	8	●
10	40	100	10	●
12	48	110	12	●
16	64	140	16	●
20	80	160	20	●



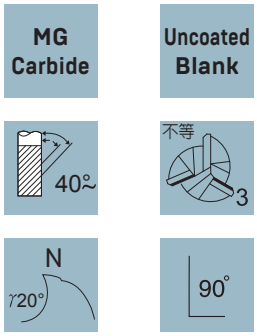
Code No. E143-5.0-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E143-5.0
3	15	55	6	●
4	20	60	6	●
5	25	65	6	●
6	30	75	6	●
8	40	90	8	●
10	50	100	10	●
12	60	110	12	●
16	80	160	16	●
20	100	200	20	●

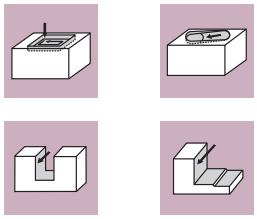


Aluminium

P	H	M	K	N	S
				●	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E143-3.0 / E143-4.0 / E143-5.0	3	42,000	1,000
E143-3.0 / E143-4.0 / E143-5.0	4	31,000	1,400
E143-3.0 / E143-4.0 / E143-5.0	5	25,000	1,800
E143-3.0 / E143-4.0 / E143-5.0	6	21,000	2,000
E143-3.0 / E143-4.0 / E143-5.0	8	16,000	2,200
E143-3.0 / E143-4.0 / E143-5.0	10	12,700	2,400
E143-3.0 / E143-4.0 / E143-5.0	12	10,600	2,200
E143-3.0 / E143-4.0 / E143-5.0	16	8,000	2,000
E143-3.0 / E143-4.0 / E143-5.0	20	6,300	1,800
切入深度 （mm） 		ap:2.5D ae:0.1D	

※ Notice: E143-4.0/E143-5.0 is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※ 注意E143-4.0/E143-5.0為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

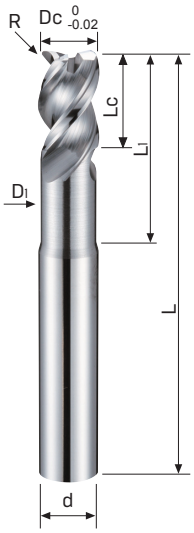
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E145 超微粒鎢鋼強力鋁用立銑刀

End Mills For Aluminium

Code No. E145-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h6	L1 mm	D1 mm	Blank E145
3	—	4.5	50	6	9	2.8	●
3	R0.1	4.5	50	6	9	2.8	●
3	R0.2	4.5	50	6	9	2.8	●
3	R0.3	4.5	50	6	9	2.8	●
3	R0.5	4.5	50	6	9	2.8	●
4	—	6	50	6	12	3.7	●
4	R0.1	6	50	6	12	3.7	●
4	R0.2	6	50	6	12	3.7	●
4	R0.3	6	50	6	12	3.7	●
4	R0.5	6	50	6	12	3.7	●
5	—	7.5	60	6	15	4.6	●
5	R0.1	7.5	60	6	15	4.6	●
5	R0.2	7.5	60	6	15	4.6	●
5	R0.3	7.5	60	6	15	4.6	●
5	R0.5	7.5	60	6	15	4.6	●
6	—	9	60	6	18	5.5	●
6	R0.2	9	60	6	18	5.5	●
6	R0.3	9	60	6	18	5.5	●
6	R0.5	9	60	6	18	5.5	●
6	R0.8	9	60	6	18	5.5	●
6	R1.2	9	60	6	18	5.5	●
6	R1.5	9	60	6	18	5.5	●
6	R1.6	9	60	6	18	5.5	●
6	R2	9	60	6	18	5.5	●
8	—	12	70	8	24	7.3	●
8	R0.2	12	70	8	24	7.3	●
8	R0.3	12	70	8	24	7.3	●
8	R0.5	12	70	8	24	7.3	●
8	R0.8	12	70	8	24	7.3	●
8	R1	12	70	8	24	7.3	●
8	R1.2	12	70	8	24	7.3	●
8	R1.5	12	70	8	24	7.3	●
8	R1.6	12	70	8	24	7.3	●
8	R2	12	70	8	24	7.3	●
8	R3	12	70	8	24	7.3	●
10	—	15	80	10	30	9.2	●
10	R0.2	15	80	10	30	9.2	●
10	R0.3	15	80	10	30	9.2	●
10	R0.5	15	80	10	30	9.2	●
10	R0.8	15	80	10	30	9.2	●
10	R1	15	80	10	30	9.2	●
10	R1.2	15	80	10	30	9.2	●
10	R1.5	15	80	10	30	9.2	●
10	R1.6	15	80	10	30	9.2	●
10	R2	15	80	10	30	9.2	●
10	R3	15	80	10	30	9.2	●
12	—	18	90	12	36	11	●
12	R0.2	18	90	12	36	11	●
12	R0.3	18	90	12	36	11	●
12	R0.5	18	90	12	36	11	●
12	R0.8	18	90	12	36	11	●
12	R1	18	90	12	36	11	●
12	R1.2	18	90	12	36	11	●
12	R1.5	18	90	12	36	11	●
12	R1.6	18	90	12	36	11	●
12	R2	18	90	12	36	11	●
12	R3	18	90	12	36	11	●
16	—	24	110	16	48	14.5	●
16	R0.5	24	110	16	48	14.5	●
16	R1	24	110	16	48	14.5	●
16	R2	24	110	16	48	14.5	●
16	R3	24	110	16	48	14.5	●
16	R4	24	110	16	48	14.5	●
20	—	30	125	20	60	18.2	●
20	R0.5	30	125	20	60	18.2	●
20	R1	30	125	20	60	18.2	●
20	R2	30	125	20	60	18.2	●
20	R3	30	125	20	60	18.2	●
20	R4	30	125	20	60	18.2	●

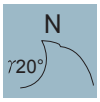


Aluminium

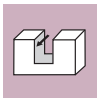
P	H	M	K	N	S
				●	

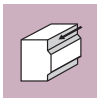
MG Carbide

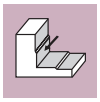
Uncoated Blank



Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	○
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E145 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E145-3	3	42,000	1,900
E145-4	4	31,000	2,200
E145-5	5	25,000	2,200
E145-6	6	21,000	2,400
E145-8	8	16,000	2,600
E145-10	10	12,700	3,000
E145-12	12	10,600	3,200
E145-16	16	8,000	3,200
E145-20	20	6,300	3,100
切入深度 (mm) 		ap:0.75D ae:0.3D	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E145-3	3	42,000	1,340
E145-4	4	31,000	1,400
E145-5	5	25,000	1,480
E145-6	6	21,000	1,640
E145-8	8	16,000	1,720
E145-10	10	12,700	1,940
E145-12	12	10,600	2,100
E145-16	16	7,900	2,100
E145-20	20	6,300	2,100
切入深度 (mm) 		0.75D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

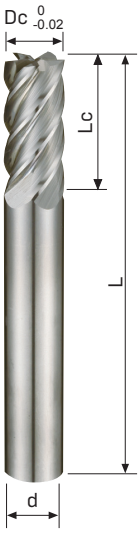
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E194 超微粒鎢鋼鏡面鋁用立銑刀

Utmost Finishing End Mills For Aluminium

Code No. E194-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z	Blank E194
3	8	50	6	3	●
4	11	50	6	3	●
5	13	50	6	4	●
6	16	50	6	4	●
8	20	60	8	4	●
10	22	72	10	5	●
12	26	75	12	5	●

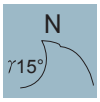


Aluminium

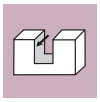
P	H	M	K	N	S
				●	

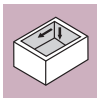
MG Carbide

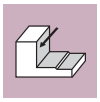
Uncoated Blank



Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E194-3	3	12,500	900
E194-4	4	9,500	950
E194-5	5	7,600	970
E194-6	6	6,350	990
E194-8	8	4,800	1,000
E194-10	10	3,800	1,000
E194-12	12	3,200	1,100
切入深度 （mm） 		ap:1.5D ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

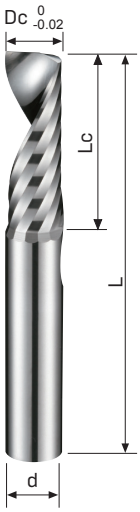
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E195R / E195L 超微粒鎢鋼鋁用立銑刀

End Mills For Aluminium

Code No. E195R-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E195R
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●

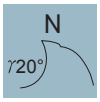


Aluminium

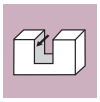
P	H	M	K	N	S
				●	

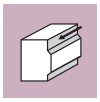
MG Carbide

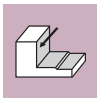
Uncoated Blank

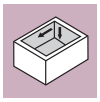


Type of Operation



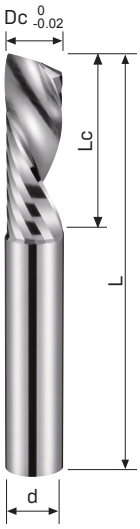






Code No. E195L-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E195L
3	12	38	3	●
4	15	50	4	●
6	18	50	6	●
8	22	60	8	●
10	30	72	10	●
12	30	75	12	●



Work Material

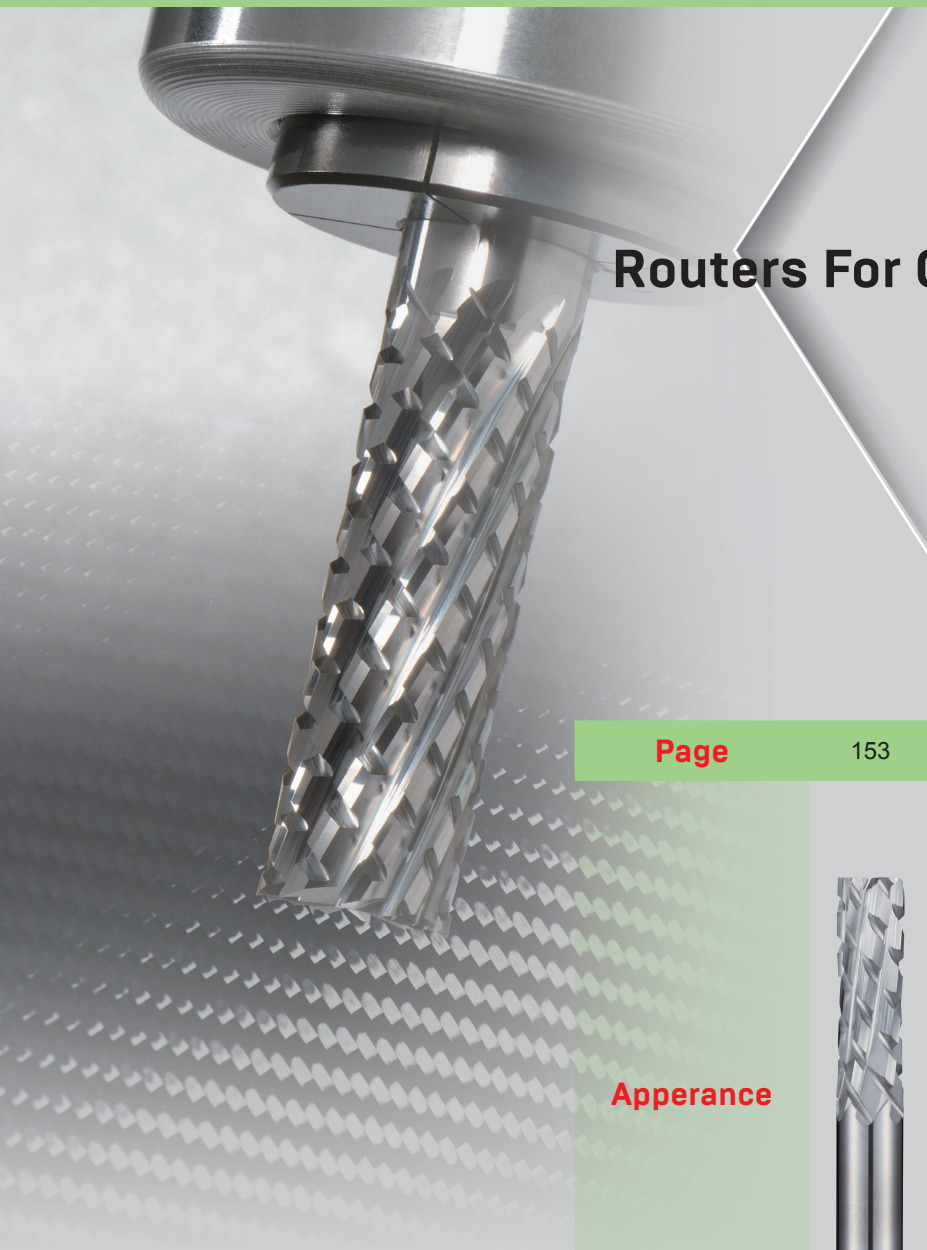
P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		188	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E195R/E195L-3	3	20,000	6,000
E195R/E195L-4	4	15,000	5,000
E195R/E195L-6	6	10,000	5,000
E195R/E195L-8	8	8,400	4,000
E195R/E195L-10	10	6,700	4,000
E195R/E195L-12	12	5,000	5,000
切入深度 （mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



複合材料用起槽刀
Routers For Composite Materials

Page	153	155	155	155	157	157
Apperance						
Code No	E190 E191	E197	E198	E199	E298	E299
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank
Helix Angle						
No.of Flutes						

7leaders®
The Art of Cutting

159	159	161	161
			
E291	**E294**	**E189R**	**E189L**
MG Carbide	**MG Carbide**	**MG Carbide**	**MG Carbide**
Uncoated Blank	**Uncoated Blank**	**Uncoated Blank**	**Uncoated Blank**
		 21°	 21°
 1	 4	 1	 1

E190 / E191 超微粒鎢鋼複合材料用起槽刀

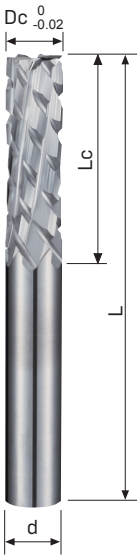
Routers For Composite Materials

Code No. E190-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z T	Blank E190	Diamond E190SP
3	9	50	3	4	●	——
4	12	60	4	4	●	——
6	18	70	6	6	●	——
8	24	75	8	6	●	——
10	30	80	10	6	●	——
12	36	80	12	8	●	——

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨



FRP CFRP

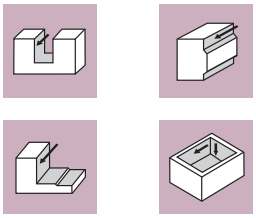
P	H	M	K	N	S
				●	

MG Carbide

Uncoated Blank

Diamond SP3

Type of Operation

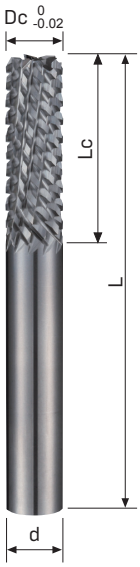


Code No. E191-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Z T	Blank E191	Diamond E191SP
3	9	50	3	6	●	——
4	12	60	4	6	●	——
6	18	70	6	8	●	——
8	24	75	8	10	●	——
10	30	80	10	12	●	——
12	36	80	12	14	●	——

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.13 復合材料 FRP CFRP Composite Material	
切削速度 Vc m/min		188	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E190/E191-3	3	20,000	6,000
E190/E191-4	4	15,000	5,000
E190/E191-6	6	10,000	5,000
E190/E191-8	8	8,400	4,000
E190/E191-10	10	6,700	4,000
E190/E191-12	12	5,000	5,000
切入深度 （mm） 		ap:0.5D	

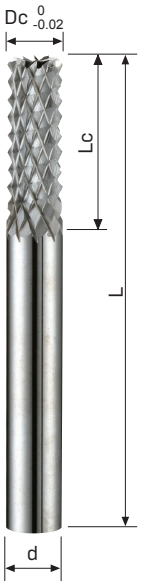
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E197-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E197	Diamond E197SP
3	12	38	3	●	——
4	15	50	4	●	——
6	18	50	6	●	——
8	22	60	8	●	——
10	30	72	10	●	——
12	30	75	12	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



Burr End cut

FRP CFRP

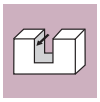
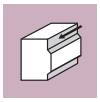
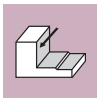
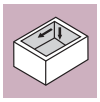
P	H	M	K	N	S
				●	

MG Carbide

Uncoated Blank

Diamond SP3

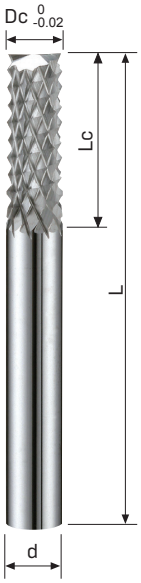
Type of Operation

Code No. E198-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E198	Diamond E198SP
3	12	38	3	●	——
4	15	50	4	●	——
6	18	50	6	●	——
8	22	60	8	●	——
10	30	72	10	●	——
12	30	75	12	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



End Mill End cut

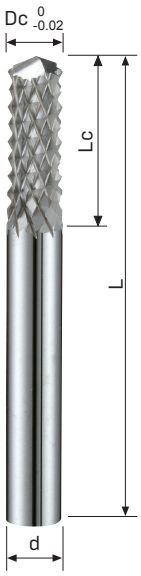
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E199-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E199	Diamond E199SP
3	12	38	3	●	——
4	15	50	4	●	——
6	18	50	6	●	——
8	22	60	8	●	——
10	30	72	10	●	——
12	30	75	12	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



135° Drill Point

Slotting 溝切削

被削材 Work Material		GR.13 復合材料 FRP CFRP Composite Material	
切削速度 Vc m/min		188	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E197/E198/E199-3	3	20,000	6,000
E197/E198/E199-4	4	15,000	5,000
E197/E198/E199-6	6	10,000	5,000
E197/E198/E199-8	8	8,400	4,000
E197/E198/E199-10	10	6,700	4,000
E197/E198/E199-12	12	5,000	5,000
切入深度 （mm） 		ap:0.5D	

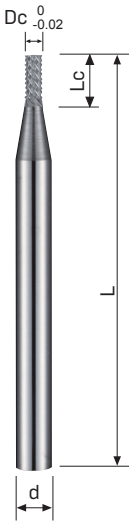
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E298-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E298	Diamond E298SP
1.5	3.0	50	4	●	——
1.8	3.6	50	4	●	——
2.0	4.0	50	4	●	——
2.5	5.0	50	4	●	——
3.0	6.0	50	4	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



End Mill End cut

FRP CFRP

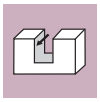
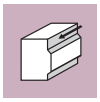
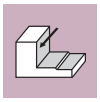
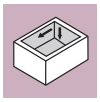
P	H	M	K	N	S
				●	

MG Carbide

Uncoated Blank

Diamond SP3

Type of Operation

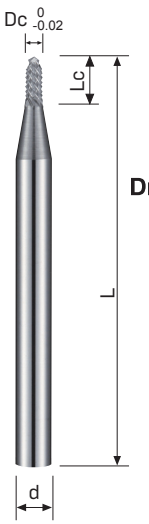
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E299-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E299	Diamond E299SP
1.5	3.0	50	4	●	——
1.8	3.6	50	4	●	——
2.0	4.0	50	4	●	——
2.5	5.0	50	4	●	——
3.0	6.0	50	4	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



135° Drill Point

Slotting 溝切削

被削材 Work Material		GR.13 復合材料FRP CFRP Composite Material	
切削速度 Vc m/min		40~200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E298/E299-1.5	1.5	20,000	4,000
E298/E299-1.8	1.8	20,000	4,000
E298/E299-2.0	2.0	20,000	5,000
E298/E299-2.5	2.5	20,000	6,000
E298/E299-3.0	3.0	20,000	6,000
切入深度 （mm） 		ap:0.5D	

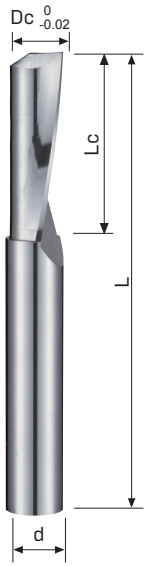
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E291-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E291	Diamond E291SP
3	9	50	3	●	——
4	12	60	4	●	——
6	18	70	6	●	——
8	24	75	8	●	——
10	30	80	10	●	——
12	36	80	12	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



FRP CFRP

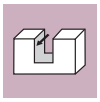
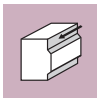
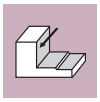
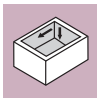
P	H	M	K	N	S
				●	

MG Carbide

Uncoated Blank

Diamond SP3

Type of Operation

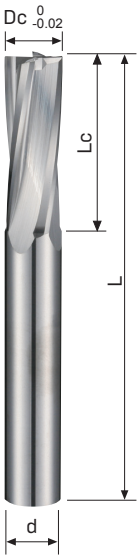
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E294-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E294	Diamond E294SP
3	9	50	3	●	——
4	12	60	4	●	——
6	18	70	6	●	——
8	24	75	8	●	——
10	30	80	10	●	——
12	36	80	12	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨



E291 / E294 切削條件參考表

Recommended Milling Conditions

E291 / Slotting 溝切削

被削材 Work Material		GR.13 復合材料 FRP CFRP Composite Material	
切削速度 Vc m/min		188	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E291-3	3	20,000	6,000
E291-4	4	15,000	5,000
E291-6	6	10,000	5,000
E291-8	8	8,400	4,000
E291-10	10	6,700	4,000
E291-12	12	5,000	5,000
切入深度 （mm） 		ap:0.5D	

E294 / Slotting 溝切削

被削材 Work Material		GR.13 復合材料 FRP CFRP Composite Material	
切削速度 Vc m/min		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E294-3	3	21,000	4,200
E294-4	4	16,000	3,200
E294-6	6	10,000	3,200
E294-8	8	8,000	2,560
E294-10	10	6,400	3,072
E294-12	12	5,300	3,180
切入深度 （mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

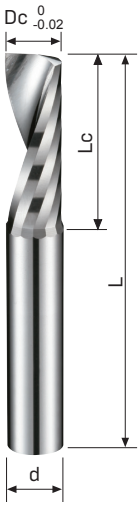
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E189R / E189L 超微粒鎢鋼鋁用立銑刀

End Mills For Plastics

Code No. E189R-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E189R
3	12	50	3	●
4	15	50	4	●
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●

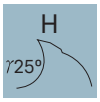


Plastics

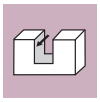
P	H	M	K	N	S
				●	

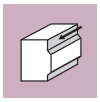
MG Carbide

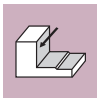
Uncoated Blank

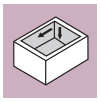


Type of Operation







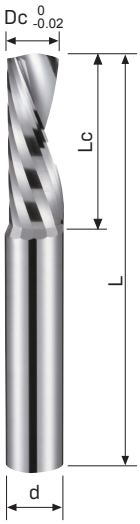


Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. E189L-Dc

Dc 0 -0.02	Lc mm	L mm	d h6	Blank E189L
3	12	50	3	●
4	15	50	4	●
6	20	63	6	●
8	25	63	8	●
10	30	72	10	●
12	38	75	12	●



Slotting 溝切削

被削材 Work Material		GR.12 塑膠 Plastics	
切削速度 Vc m/min		188	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E189R/E189L-3	3	20,000	6,000
E189R/E189L-4	4	15,000	5,000
E189R/E189L-6	6	10,000	5,000
E189R/E189L-8	8	8,400	4,000
E189R/E189L-10	10	6,700	4,000
E189R/E189L-12	12	5,000	5,000
切入深度 （mm） 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

石墨用立銑刀
End Mills For Graphite

Page	165	167	169	171
Apperance				
Code No	G696DC	G234DC G244DC	G697DC	G298DC
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Diamond DC	Diamond DC	Diamond DC	Diamond DC
Helix Angle	 30°	 30°	 30°	 30°
No.of Flutes	 2	 2	 2	 4

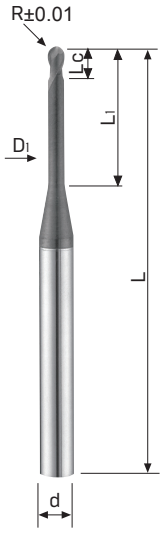
7leaders®
The Art of Cutting

G696DC 超微粒鎢鋼鑽石塗層石墨用圓頭立銑刀

Ball Nose End Mills For Graphite

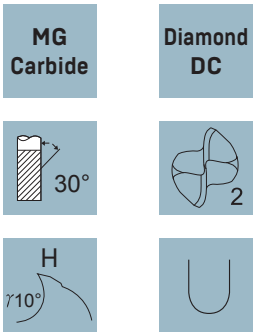
Code No. G696DC-R×L1

R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G696DC
0.2R	5	0.6	50	4	0.37	●
0.2R	10	0.6	50	4	0.37	●
0.3R	5	0.9	50	4	0.55	●
0.3R	10	0.9	50	4	0.55	●
0.3R	15	0.9	60	4	0.55	●
0.3R	20	0.9	60	4	0.55	●
0.5R	5	1.5	50	4	0.95	●
0.5R	10	1.5	50	4	0.95	●
0.5R	15	1.5	60	4	0.95	●
0.5R	20	1.5	60	4	0.95	●
0.5R	30	1.5	80	4	0.95	●
0.75R	5	2.3	60	4	1.45	●
0.75R	10	2.3	60	4	1.45	●
0.75R	15	2.3	60	4	1.45	●
0.75R	20	2.3	60	4	1.45	●
0.75R	30	2.3	80	4	1.45	●
0.75R	40	2.3	80	4	1.45	●
1R	5	3	60	4	1.95	●
1R	10	3	60	4	1.95	●
1R	15	3	60	4	1.95	●
1R	20	3	60	4	1.95	●
1R	30	3	80	4	1.95	●
1R	40	3	80	4	1.95	●
1R	60	3	100	4	1.95	●
1.5R	10	4.5	60	4	2.85	●
1.5R	20	4.5	60	4	2.85	●
1.5R	40	4.5	80	4	2.85	●
1.5R	60	4.5	100	4	2.85	●
2R	20	6	60	4	3.85	●
2R	40	6	80	4	3.85	●
2R	60	6	120	4	3.85	●

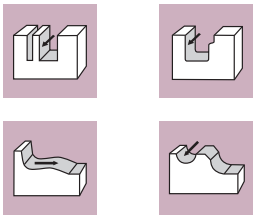


Graphite

P	H	M	K	N	S
				●	



Type of Operation

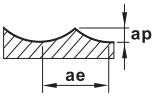


Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	●
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

High-speed machining 高速加工

被削材 Work Material		GR.14 石墨 Graphite		
型號 Code No.	圓頭×頸長 R×L1	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	AP 切削深度 (mm)
G696DC-0.2R	0.2R×5	38000~20000	850~480	0.03
G696DC-0.2R	0.2R×10	30000~18000	430~250	0.03
G696DC-0.3R	0.3R×5	38000~20000	960~480	0.06
G696DC-0.3R	0.3R×10	30000~20000	580~385	0.05
G696DC-0.3R	0.3R×15	15000~10000	215~145	0.03
G696DC-0.3R	0.3R×20	8000~7000	115~95	0.03
G696DC-0.5R	0.5R×5	38000~20000	1080~600	0.1
G696DC-0.5R	0.5R×10	30000~20000	840~575	0.1
G696DC-0.5R	0.5R×15	23000~18000	530~410	0.08
G696DC-0.5R	0.5R×20	16000~12000	270~205	0.08
G696DC-0.5R	0.5R×30	8000~5000	145~85	0.04
G696DC-0.75R	0.75R×5	38000~20000	1700~900	0.15
G696DC-0.75R	0.75R×10	36000~20000	1440~865	0.15
G696DC-0.75R	0.75R×15	30000~20000	1300~865	0.15
G696DC-0.75R	0.75R×20	20000~18000	670~625	0.15
G696DC-0.75R	0.75R×30	11500~9000	295~240	0.1
G696DC-0.75R	0.75R×40	7000~5000	190~130	0.075
G696DC-1R	1R×5	38000~20000	2650~1350	0.2
G696DC-1R	1R×10	38000~20000	2250~1350	0.2
G696DC-1R	1R×15	28000~20000	1800~1350	0.2
G696DC-1R	1R×20	21800~18000	1470~1100	0.2
G696DC-1R	1R×30	15200~11500	800~615	0.18
G696DC-1R	1R×40	5700~4000	315~210	0.13
G696DC-1R	1R×60	5700~4000	315~210	0.08
G696DC-1.5R	1.5R×10	36000~20000	2400~1350	0.3
G696DC-1.5R	1.5R×20	19000~15500	1945~1550	0.3
G696DC-1.5R	1.5R×40	11875~9200	950~740	0.22
G696DC-1.5R	1.5R×60	6650~4000	465~280	0.15
G696DC-2R	2R×20	19000~14000	2800~2050	0.4
G696DC-2R	2R×40	11000~9500	1615~1350	0.4
G696DC-2R	2R×60	7800~5700	1120~770	0.3



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

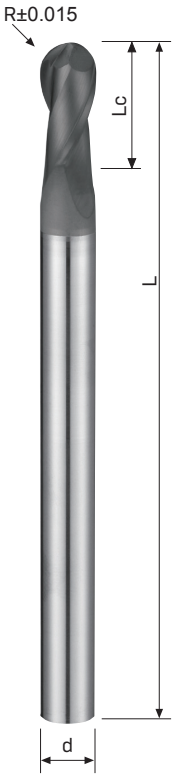
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

G234DC / G244DC 超微粒鎢鋼鑽石塗層石墨用圓頭立銑刀

Ball Nose End Mills For Graphite

Code No. G234DC-Dc

Dc 0 -0.03	R ±0.015	Lc mm	L mm	d h6	Diamond G234DC
4	2R	8	80	4	●
6	3R	12	80	6	●
8	4R	16	100	8	●
10	5R	20	100	10	●
12	6R	24	110	12	●

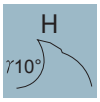


Graphite

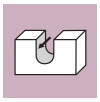
P	H	M	K	N	S
				●	

MG Carbide

Diamond DC

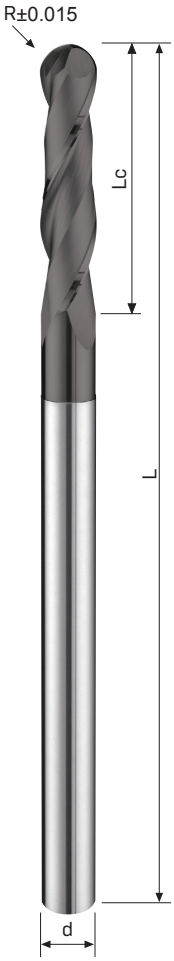


Type of Operation



Code No. G244DC-Dc

Dc 0 -0.03	R ±0.015	Lc mm	L mm	d h6	Diamond G244DC
4	2R	20	120	4	●
6	3R	30	120	6	●
8	4R	40	160	8	●
10	5R	50	180	10	●
12	6R	60	200	12	●



Work Material

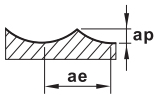
P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	●
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

G234DC / G244DC 切削條件參考表

Recommended Milling Conditions

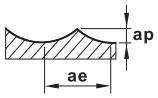
Roughing 粗加工

被削材 Work Material		GR.14 石墨 Graphite		
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	AP 切削深度 (mm)
G234DC/G244DC-R2	4	19000~11000	2900~1800	0.40
G234DC/G244DC-R3	6	19000~9600	4000~2100	0.60
G234DC/G244DC-R4	8	15200~7200	3700~1800	0.80
G234DC/G244DC-R5	10	11875~5700	2750~1350	1.00
G234DC/G244DC-R6	12	9975~4800	2400~1100	1.20



Finishing 精加工

被削材 Work Material		GR.14 石墨 Graphite		
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	AP 切削深度 (mm)
G234DC/G244DC-R2	4	19000~11000	1900~1200	0.12
G234DC/G244DC-R3	6	19000~9600	2800~1400	0.18
G234DC/G244DC-R4	8	15200~7200	2400~1200	0.22
G234DC/G244DC-R5	10	11875~5700	1800~900	0.25
G234DC/G244DC-R6	12	9975~4800	1600~750	0.30



※ Notice: G244DC is Long Length series End Mills. Please adjust the parameter according.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※ 注意G244DC為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

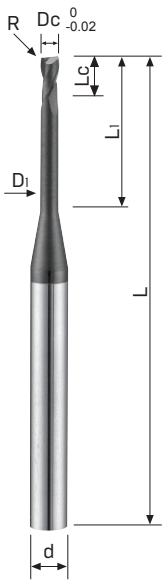
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

G697DC 超微粒鎢鋼鑽石塗層石墨用立銑刀

End Mills For Graphite

Code No. G697DC-Dc×R×L1

Dc 0 -0.02	R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G697DC
0.5	R0.1	5	0.9	50	4	0.45	●
0.5	R0.1	10	0.9	50	4	0.45	●
0.5	R0.1	15	0.9	60	4	0.45	●
0.5	R0.1	20	0.9	60	4	0.45	●
1	R0.2	5	1.5	50	4	0.95	●
1	R0.2	10	1.5	50	4	0.95	●
1	R0.2	15	1.5	60	4	0.95	●
1	R0.2	20	1.5	60	4	0.95	●
1	R0.2	30	1.5	80	4	0.95	●
1.5	R0.2	5	2.3	60	4	1.45	●
1.5	R0.2	10	2.3	60	4	1.45	●
1.5	R0.2	15	2.3	60	4	1.45	●
1.5	R0.2	20	2.3	60	4	1.45	●
1.5	R0.2	30	2.3	80	4	1.45	●
1.5	R0.2	40	2.3	80	4	1.45	●
2	R0.2	5	3	60	4	1.95	●
2	R0.2	10	3	60	4	1.95	●
2	R0.2	15	3	60	4	1.95	●
2	R0.2	20	3	60	4	1.95	●
2	R0.2	30	3	80	4	1.95	●
2	R0.2	40	3	80	4	1.95	●
2	R0.2	60	3	100	4	1.95	●
3	R0.2	10	4.5	60	4	2.85	●
3	R0.2	20	4.5	60	4	2.85	●
3	R0.2	40	4.5	80	4	2.85	●
3	R0.2	60	4.5	100	4	2.85	●
4	R0.2	20	6	60	4	3.85	●
4	R0.2	40	6	80	4	3.85	●
4	R0.2	60	6	120	4	3.85	●

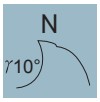


Graphite

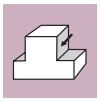
P	H	M	K	N	S
				●	

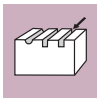
MG Carbide

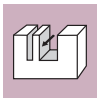
Diamond DC

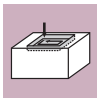


Type of Operation







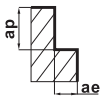


Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	●
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

High-speed machining 高速加工

被削材 Work Material		GR.14 石墨 Graphite			
型號 Code No.	刃徑×頸長 Dc×Ll	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	AP 切削深度 (mm)	AE 切削寬度 (mm)
G697DC	0.5×5	19000~16000	684~575	0.05	0.24
G697DC	0.5×10	15200~12000	540~500	0.04	0.24
G697DC	0.5×15	10400~9000	375~325	0.03	0.12
G697DC	0.5×20	10200~8000	375~290	0.03	0.09
G697DC	1×5	15200~12000	1080~865	0.12	0.45
G697DC	1×10	15200~12000	1080~865	0.1	0.45
G697DC	1×15	13300~11000	950~790	0.1	0.43
G697DC	1×20	11000~8000	820~575	0.1	0.4
G697DC	1×30	8500~700	615~505	0.08	0.35
G697DC	1.5×5	15200~13000	1300~1100	0.17	0.85
G697DC	1.5×10	15200~13000	1300~1100	0.12	0.85
G697DC	1.5×15	13300~11000	1140~925	0.1	0.85
G697DC	1.5×20	12000~10000	1020~850	0.1	0.85
G697DC	1.5×30	11400~8000	950~670	0.08	0.85
G697DC	1.5×40	9500~7000	870~590	0.08	0.7
G697DC	2×5	15200~12000	1900~1500	0.3	1.25
G697DC	2×10	15200~12000	1900~1500	0.3	1.25
G697DC	2×15	12300~9000	1500~1150	0.2	1.25
G697DC	2×20	104500~8000	1330~1000	0.18	1.2
G697DC	2×30	9000~7000	1080~850	0.13	0.8
G697DC	2×40	7600~6000	950~755	0.13	0.8
G697DC	2×60	5700~4000	715~505	0.07	0.6
G697DC	3×10	15200~12000	2300~1850	0.35	2.0
G697DC	3×20	13300~10000	2040~1550	0.3	2.0
G697DC	3×40	11400~8000	1750~1250	0.2	1.8
G697DC	3×60	6650~4000	1045~615	0.15	1.6
G697DC	4×20	12000~8500	3250~2300	0.35	2.8
G697DC	4×40	11400~8000	2950~2100	0.35	2.8
G697DC	4×60	5700~3000	1615~855	0.2	2.0



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

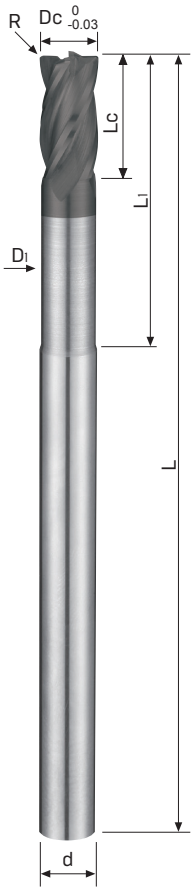
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

G298DC 超微粒鎢鋼鑽石塗層石墨用立銑刀

End Mills For Graphite

Code No. G298DC-Dc×R×L1

Dc 0 -0.03	R ±0.01	L1 mm	Lc mm	L mm	d h5	D1 mm	Diamond G298DC
4	R0.5	20	8	80	4	3.85	●
6	R0.5	30	12	100	6	5.7	●
8	R0.5	40	16	120	8	7.6	●
10	R0.5	50	20	140	10	9.5	●
12	R0.5	60	24	160	12	11.4	●

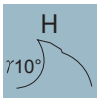


Graphite

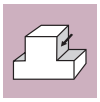
P	H	M	K	N	S
				●	

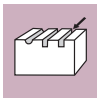
MG Carbide

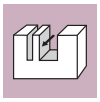
Diamond DC

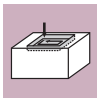


Type of Operation









Work Material

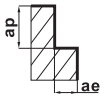
P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	●
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

G298DC 切削條件參考表

Recommended Milling Conditions

Ordinary cutting 普通切削

被削材 Work Material		GR.14 石墨 Graphite			
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	AP 切削深度 （mm）	AE 切削寬度 （mm）
G298DC-4	4	12000~8000	2450~1650	0.08	1.00
G298DC-6	6	12000~7000	3050~1800	0.20	2.00
G298DC-8	8	10000~7000	2700~1900	0.20	2.80
G298DC-10	10	8000~4000	2200~1100	0.20	4.40
G298DC-12	12	6000~3000	1650~815	0.20	4.40



1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

鑽頭
Drills

Page	175	177	179	183	185	187
Apperance						
Code No	D921X D922X D932X	D923X D924X	D420HX	D421TX	D422TX	D423TX-3
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	AlTiN X-NaNo	AlTiN X-NaNo	AlTiCrN HX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
Helix Angle	D	D	30°	3XD	5XD	3XD
No.of Flutes	2	2	2	2	2	2

7leaders®
The Art of Cutting

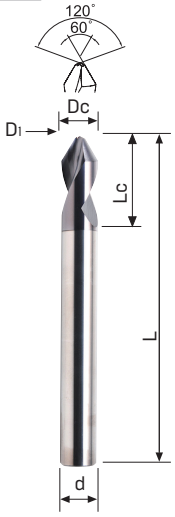
189	191	193	195
			
D423TX-5	D423TX-8	D423TX-12 D423TX-16	D423TX-20 D423TX-25 D423TX-30
MG Carbide	MG Carbide	MG Carbide	MG Carbide
AlTiSiN TX	AlTiSiN TX	AlTiSiN TX	AlTiSiN TX
 5XD	 8XD	 12XD 16XD	 20XD
 2	 2	 2	 2

D921X / D922X / D932X 超微粒鎢鋼塗層NC定點鑽頭

NC Spot Drills

Code No. D921X

Dc h6	Lc mm	L mm	d h6	D1 mm	60° D921X
0.5	1	38	3	0.15	●
1	2	38	3	0.3	●
2	4	38	3	0.6	●
3	6	50	3	1.0	●
4	8	50	4	1.5	●
6	12	70	6	2.0	●
8	16	80	8	2.5	●
10	20	90	10	3.0	●
12	24	110	12	4.0	●
16	32	120	16	5.0	●
20	40	130	20	6.0	●



Steel < 48HRC

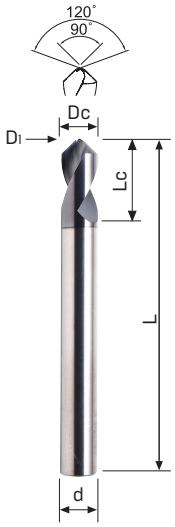
P	H	M	K	N	S
●	●	○	●	○	○

MG Carbide

AlTiN X-NaNo

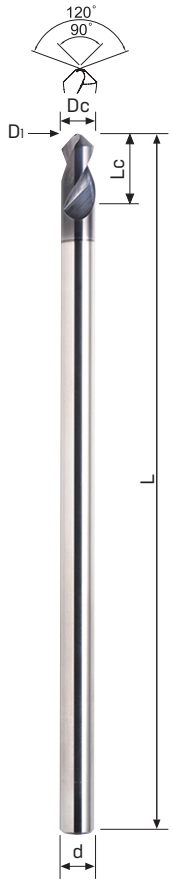
Code No. D922X

Dc h6	Lc mm	L mm	d h6	D1 mm	90° D922X
0.5	1	38	3	0.15	●
1	2	38	3	0.3	●
2	4	38	3	0.6	●
3	6	50	3	1.0	●
4	8	50	4	1.5	●
6	12	70	6	2.0	●
8	16	80	8	2.5	●
10	20	90	10	3.0	●
12	24	110	12	4.0	●
16	32	120	16	5.0	●
20	40	130	20	6.0	●



Code No. D932X

Dc h6	Lc mm	L mm	d h6	D1 mm	90° D932X
3	9	75	3	1	●
4	12	100	4	1.5	●
6	15	150	6	2	●
8	20	150	8	2.5	●
10	25	200	10	3	●
12	30	200	12	4	●
16	40	250	16	5	●
20	45	250	20	6	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Borehole parameters 鑽孔參數

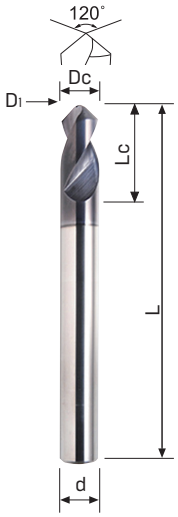
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		40~85		40~85		40~85		20~30		15~25		65~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D921X/D922X-0.5	0.5	20,000	0.003~0.02	20,000	0.003~0.02	20,000	0.003~0.02	15,000	0.003~0.02	9,000	0.003~0.02	-	-
D921X/D922X-1	1	10,000	0.01~0.04	10,000	0.01~0.04	10,000	0.01~0.04	7,500	0.01~0.04	4,500	0.01~0.04	20,000	0.01~0.035
D921X/D922X-2	2	5,000	0.03~0.07	5,000	0.03~0.07	5,000	0.03~0.07	3,800	0.03~0.07	2,200	0.03~0.07	12,000	0.03~0.063
D921X/D922X/D932X-3	3	7,500	0.04~0.085	7,500	0.04~0.085	7,500	0.04~0.085	2,500	0.04~0.085	1,500	0.04~0.085	8,000	0.05~0.095
D921X/D922X/D932X-4	4	5,700	0.05~0.12	5,700	0.05~0.12	5,700	0.05~0.12	1,900	0.05~0.12	1,100	0.05~0.12	6,500	0.07~0.15
D921X/D922X/D932X-6	6	3,800	0.06~0.13	3,800	0.06~0.13	3,800	0.06~0.13	1,300	0.06~0.13	750	0.06~0.13	4,300	0.12~0.2
D921X/D922X/D932X-8	8	2,800	0.08~0.16	2,800	0.08~0.16	2,800	0.08~0.16	1,000	0.08~0.16	550	0.08~0.16	3,200	0.15~0.2
D921X/D922X/D932X-10	10	2,300	0.1~0.2	2,300	0.1~0.2	2,300	0.1~0.2	750	0.1~0.2	450	0.1~0.2	2,600	0.1~0.25
D921X/D922X/D932X-12	12	1,900	0.15~0.25	1,900	0.15~0.25	1,900	0.15~0.25	650	0.15~0.25	370	0.15~0.25	2,200	0.2~0.3
D921X/D922X/D932X-16	16	1,400	0.15~0.3	1,400	0.15~0.3	1,400	0.15~0.3	480	0.15~0.3	280	0.15~0.3	1,600	0.25~0.35
D921X/D922X/D932X-20	20	1,150	0.18~0.35	1,150	0.18~0.35	1,150	0.18~0.35	380	0.18~0.35	220	0.18~0.35	1,300	0.28~0.4

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D923X

Dc h6	Lc mm	L mm	d h6	120° D923X
0.5	1	38	3	●
1	2	38	3	●
2	4	38	3	●
3	6	50	3	●
4	8	50	4	●
6	12	70	6	●
8	16	80	8	●
10	20	90	10	●
12	24	110	12	●
16	32	120	16	●
20	40	130	20	●



Steel < 48HRC

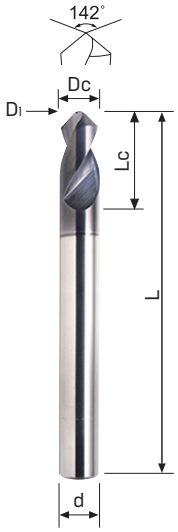
P	H	M	K	N	S
●	●	○	●	○	○

MG Carbide

AlTiN X-NaNo

Code No. D924X

Dc h6	Lc mm	L mm	d h6	142° D924X
0.5	1	38	3	●
1	2	38	3	●
2	4	38	3	●
3	6	50	3	●
4	8	50	4	●
6	12	70	6	●
8	16	80	8	●
10	20	90	10	●
12	24	110	12	●
16	32	120	16	●
20	40	130	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D923X / D924X 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

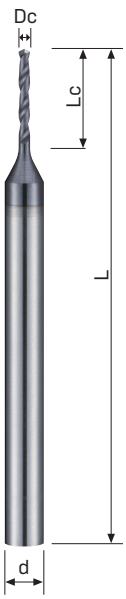
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		40~85		40~85		40~85		20~30		15~25		65~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D923X/D924X-0.5	0.5	20,000	0.003~0.02	20,000	0.003~0.02	20,000	0.003~0.02	15,000	0.003~0.02	9,000	0.003~0.02	-	-
D923X/D924X-1	1	10,000	0.01~0.04	10,000	0.01~0.04	10,000	0.01~0.04	7,500	0.01~0.04	4,500	0.01~0.04	20,000	0.01~0.035
D923X/D924X-2	2	5,000	0.03~0.07	5,000	0.03~0.07	5,000	0.03~0.07	3,800	0.03~0.07	2,200	0.03~0.07	12,000	0.03~0.063
D923X/D924X-3	3	7,500	0.04~0.085	7,500	0.04~0.085	7,500	0.04~0.085	2,500	0.04~0.085	1,500	0.04~0.085	8,000	0.05~0.095
D923X/D924X-4	4	5,700	0.05~0.12	5,700	0.05~0.12	5,700	0.05~0.12	1,900	0.05~0.12	1,100	0.05~0.12	6,500	0.07~0.15
D923X/D924X-6	6	3,800	0.06~0.13	3,800	0.06~0.13	3,800	0.06~0.13	1,300	0.06~0.13	750	0.06~0.13	4,300	0.12~0.2
D923X/D924X-8	8	2,800	0.08~0.16	2,800	0.08~0.16	2,800	0.08~0.16	1,000	0.08~0.16	550	0.08~0.16	3,200	0.15~0.2
D923X/D924X-10	10	2,300	0.1~0.2	2,300	0.1~0.2	2,300	0.1~0.2	750	0.1~0.2	450	0.1~0.2	2,600	0.1~0.25
D923X/D924X-12	12	1,900	0.15~0.25	1,900	0.15~0.25	1,900	0.15~0.25	650	0.15~0.25	370	0.15~0.25	2,200	0.2~0.3
D923X/D924X-16	16	1,400	0.15~0.3	1,400	0.15~0.3	1,400	0.15~0.3	480	0.15~0.3	280	0.15~0.3	1,600	0.25~0.35
D923X/D924X-20	20	1,150	0.18~0.35	1,150	0.18~0.35	1,150	0.18~0.35	380	0.18~0.35	220	0.18~0.35	1,300	0.28~0.4

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D420HX

Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX	Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX	Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX
0.1	0.6	38	3	●	0.7	4.5	38	3	●	1.3	8	42	3	●
0.11	0.6	38	3	●	0.71	4.5	38	3	●	1.31	8	42	3	●
0.12	0.8	38	3	●	0.72	4.5	38	3	●	1.32	8	42	3	●
0.13	0.8	38	3	●	0.73	4.5	38	3	●	1.33	9	42	3	●
0.14	0.8	38	3	●	0.74	4.5	38	3	●	1.34	9	42	3	●
0.15	1	38	3	●	0.75	4.5	38	3	●	1.35	9	42	3	●
0.16	1	38	3	●	0.76	5	38	3	●	1.36	9	42	3	●
0.17	1	38	3	●	0.77	5	38	3	●	1.37	9	42	3	●
0.18	1.2	38	3	●	0.78	5	38	3	●	1.38	9	42	3	●
0.19	1.2	38	3	●	0.79	5	38	3	●	1.39	9	42	3	●
0.2	1.5	38	3	●	0.8	5	38	3	●	1.4	9	42	3	●
0.21	1.5	38	3	●	0.81	5	38	3	●	1.41	9	42	3	●
0.22	1.5	38	3	●	0.82	5	38	3	●	1.42	9	42	3	●
0.23	1.5	38	3	●	0.83	5	38	3	●	1.43	9	42	3	●
0.24	1.5	38	3	●	0.84	5	38	3	●	1.44	9	42	3	●
0.25	1.5	38	3	●	0.85	5	38	3	●	1.45	9	42	3	●
0.26	1.5	38	3	●	0.86	5.5	38	3	●	1.46	9	42	3	●
0.27	1.5	38	3	●	0.87	5.5	38	3	●	1.47	9	42	3	●
0.28	1.5	38	3	●	0.88	5.5	38	3	●	1.48	9	42	3	●
0.29	1.5	38	3	●	0.89	5.5	38	3	●	1.49	9	42	3	●
0.3	1.5	38	3	●	0.9	5.5	38	3	●	1.5	9	42	3	●
0.31	2	38	3	●	0.91	5.5	38	3	●	1.51	10	42	3	●
0.32	2	38	3	●	0.92	5.5	38	3	●	1.52	10	42	3	●
0.33	2	38	3	●	0.93	5.5	38	3	●	1.53	10	42	3	●
0.34	2	38	3	●	0.94	5.5	38	3	●	1.54	10	42	3	●
0.35	2	38	3	●	0.95	5.5	38	3	●	1.55	10	42	3	●
0.36	2	38	3	●	0.96	6	38	3	●	1.56	10	42	3	●
0.37	2	38	3	●	0.97	6	38	3	●	1.57	10	42	3	●
0.38	2	38	3	●	0.98	6	38	3	●	1.58	10	42	3	●
0.39	2.5	38	3	●	0.99	6	38	3	●	1.59	10	42	3	●
0.4	2.5	38	3	●	1	6	38	3	●	1.6	10	42	3	●
0.41	2.5	38	3	●	1.01	6	38	3	●	1.61	10	42	3	●
0.42	2.5	38	3	●	1.02	6	38	3	●	1.62	10	42	3	●
0.43	2.5	38	3	●	1.03	6	38	3	●	1.63	10	42	3	●
0.44	2.5	38	3	●	1.04	6	38	3	●	1.64	10	42	3	●
0.45	2.5	38	3	●	1.05	6	38	3	●	1.65	10	42	3	●
0.46	2.5	38	3	●	1.06	6	38	3	●	1.66	10	42	3	●
0.47	2.5	38	3	●	1.07	7	42	3	●	1.67	10	42	3	●
0.48	2.5	38	3	●	1.08	7	42	3	●	1.68	10	42	3	●
0.49	3	38	3	●	1.09	7	42	3	●	1.69	10	42	3	●
0.5	3	38	3	●	1.1	7	42	3	●	1.7	10	42	3	●
0.51	3	38	3	●	1.11	7	42	3	●	1.71	11	42	3	●
0.52	3	38	3	●	1.12	7	42	3	●	1.72	11	42	3	●
0.53	3	38	3	●	1.13	7	42	3	●	1.73	11	42	3	●
0.54	3.5	38	3	●	1.14	7	42	3	●	1.74	11	42	3	●
0.55	3.5	38	3	●	1.15	7	42	3	●	1.75	11	42	3	●
0.56	3.5	38	3	●	1.16	7	42	3	●	1.76	11	42	3	●
0.57	3.5	38	3	●	1.17	7	42	3	●	1.77	11	42	3	●
0.58	3.5	38	3	●	1.18	7	42	3	●	1.78	11	42	3	●
0.59	3.5	38	3	●	1.19	8	42	3	●	1.79	11	42	3	●
0.6	3.5	38	3	●	1.2	8	42	3	●	1.8	11	42	3	●
0.61	4	38	3	●	1.21	8	42	3	●	1.81	11	42	3	●
0.62	4	38	3	●	1.22	8	42	3	●	1.82	11	42	3	●
0.63	4	38	3	●	1.23	8	42	3	●	1.83	11	42	3	●
0.64	4	38	3	●	1.24	8	42	3	●	1.84	11	42	3	●
0.65	4	38	3	●	1.25	8	42	3	●	1.85	11	42	3	●
0.66	4	38	3	●	1.26	8	42	3	●	1.86	11	42	3	●
0.67	4	38	3	●	1.27	8	42	3	●	1.87	11	42	3	●
0.68	4.5	38	3	●	1.28	8	42	3	●	1.88	11	42	3	●
0.69	4.5	38	3	●	1.29	8	42	3	●	1.89	11	42	3	●



Steel < 30HRC

P	H	M	K	N	S
●		●	●	●	

MG Carbide

AlTiCrN HX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D420HX 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		37		37		34		31		37		37		20	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D420HX-0.2	0.2	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.002	25,000	0.004	25,000	0.002
D420HX-0.25	0.25	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.002	22,500	0.005	22,500	0.002
D420HX-0.3	0.3	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.003	20,000	0.007	20,000	0.003
D420HX-0.35	0.35	18,750	0.004	18,750	0.004	18,500	0.004	18,250	0.004	18,750	0.004	18,750	0.009	18,250	0.004
D420HX-0.4	0.4	17,500	0.005	17,500	0.005	17,000	0.005	16,500	0.005	17,500	0.005	17,500	0.011	16,500	0.005
D420HX-0.45	0.45	16,250	0.006	16,250	0.006	15,500	0.006	14,750	0.006	16,250	0.006	16,250	0.013	14,750	0.006
D420HX-0.5	0.5	15,000	0.007	15,000	0.007	14,000	0.007	13,000	0.007	15,000	0.007	15,000	0.015	13,000	0.007
D420HX-0.55	0.55	14,750	0.008	14,750	0.008	13,750	0.008	12,820	0.008	14,750	0.008	14,750	0.016	12,450	0.007
D420HX-0.6	0.6	14,500	0.008	14,500	0.008	13,500	0.008	12,660	0.008	14,500	0.008	14,500	0.017	11,900	0.007
D420HX-0.65	0.65	14,250	0.009	14,250	0.009	13,250	0.009	12,500	0.009	14,250	0.009	14,250	0.018	11,350	0.008
D420HX-0.7	0.7	14,000	0.009	14,000	0.009	13,000	0.009	12,320	0.009	14,000	0.009	14,000	0.018	10,800	0.008
D420HX-0.75	0.75	13,750	0.010	13,750	0.010	12,750	0.010	12,160	0.010	13,750	0.010	13,750	0.019	10,250	0.008
D420HX-0.8	0.8	13,500	0.010	13,500	0.010	12,500	0.010	12,000	0.010	13,500	0.010	13,500	0.020	9,700	0.009
D420HX-0.85	0.85	13,000	0.013	13,000	0.013	12,000	0.013	11,320	0.013	13,000	0.013	13,000	0.024	8,600	0.009
D420HX-0.9	0.9	12,500	0.016	12,500	0.016	11,500	0.016	10,660	0.016	12,500	0.016	12,500	0.037	7,500	0.010
D420HX-1	1	12,000	0.020	12,000	0.020	11,000	0.020	10,000	0.020	12,000	0.020	12,000	0.030	6,400	0.010
D420HX-1.05	1.05	11,200	0.020	11,200	0.020	10,800	0.020	9,400	0.020	11,200	0.020	11,200	0.030	6,350	0.010
D420HX-1.1	1.1	10,700	0.020	10,700	0.020	9,850	0.020	9,000	0.020	10,700	0.020	10,700	0.030	6,050	0.010
D420HX-1.15	1.15	10,250	0.025	10,250	0.025	9,400	0.025	8,550	0.025	10,250	0.025	10,250	0.030	5,500	0.010
D420HX-1.2	1.2	9,800	0.025	9,800	0.025	9,000	0.025	8,200	0.025	9,800	0.025	9,800	0.030	5,300	0.010
D420HX-1.25	1.25	9,400	0.025	9,400	0.025	8,650	0.025	7,900	0.025	9,400	0.025	9,400	0.040	5,100	0.015
D420HX-1.3	1.3	9,000	0.025	9,000	0.025	8,300	0.025	7,600	0.025	9,000	0.025	9,000	0.040	4,900	0.015
D420HX-1.35	1.35	8,700	0.030	8,700	0.030	8,000	0.030	7,300	0.030	8,700	0.030	8,700	0.040	4,700	0.015
D420HX-1.4	1.4	8,400	0.030	8,400	0.030	7,700	0.030	7,050	0.030	8,400	0.030	8,400	0.050	4,550	0.015
D420HX-1.45	1.45	8,100	0.030	8,100	0.030	7,450	0.030	6,800	0.030	8,100	0.030	8,100	0.050	4,400	0.015
D420HX-1.5	1.5	7,800	0.030	7,800	0.030	7,200	0.030	6,550	0.030	7,800	0.030	7,800	0.050	4,250	0.020
D420HX-1.55	1.55	7,600	0.035	7,600	0.035	7,000	0.035	6,350	0.035	7,600	0.035	7,600	0.050	4,100	0.020
D420HX-1.6	1.6	7,350	0.035	7,350	0.035	6,750	0.035	6,150	0.035	7,350	0.035	7,350	0.060	3,950	0.020
D420HX-1.65	1.65	7,150	0.035	7,150	0.035	6,550	0.035	5,950	0.035	7,150	0.035	7,150	0.060	3,850	0.020
D420HX-1.7	1.7	6,900	0.035	6,900	0.035	6,350	0.035	5,800	0.035	6,900	0.035	6,900	0.060	3,750	0.020
D420HX-1.75	1.75	6,700	0.035	6,700	0.035	6,200	0.035	5,650	0.035	6,700	0.035	6,700	0.060	3,650	0.025
D420HX-1.8	1.8	6,550	0.040	6,550	0.040	6,000	0.040	5,450	0.040	6,550	0.040	6,550	0.060	3,500	0.025
D420HX-1.85	1.85	6,350	0.040	6,350	0.040	5,850	0.040	5,300	0.040	6,350	0.040	6,350	0.060	3,450	0.025

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

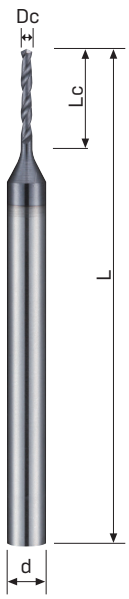
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D420HX

Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX	Dc 0 -0.005	Lc mm	L mm	d h6	AlTiCrN D420HX
1.9	11	42	3	●	2.46	14	50	3	——
1.91	12	50	3	●	2.47	14	50	3	——
1.92	12	50	3	●	2.48	14	50	3	——
1.93	12	50	3	●	2.49	14	50	3	——
1.94	12	50	3	●	2.5	14	50	3	●
1.95	12	50	3	●	2.51	14	50	3	——
1.96	12	50	3	●	2.52	14	50	3	——
1.97	12	50	3	●	2.53	14	50	3	——
1.98	12	50	3	●	2.54	14	50	3	——
1.99	12	50	3	●	2.55	14	50	3	●
2	12	50	3	●	2.56	14	50	3	——
2.01	12	50	3	——	2.57	14	50	3	——
2.02	12	50	3	——	2.58	14	50	3	——
2.03	12	50	3	——	2.59	14	50	3	——
2.04	12	50	3	——	2.6	14	50	3	●
2.05	12	50	3	●	2.61	14	50	3	——
2.06	12	50	3	——	2.62	14	50	3	——
2.07	12	50	3	——	2.63	14	50	3	——
2.08	12	50	3	——	2.64	14	50	3	——
2.09	12	50	3	——	2.65	14	50	3	●
2.1	12	50	3	●	2.66	16	50	3	——
2.11	12	50	3	——	2.67	16	50	3	——
2.12	12	50	3	——	2.68	16	50	3	——
2.13	13	50	3	——	2.69	16	50	3	——
2.14	13	50	3	——	2.7	16	50	3	●
2.15	13	50	3	●	2.71	16	50	3	——
2.16	13	50	3	——	2.72	16	50	3	——
2.17	13	50	3	——	2.73	16	50	3	——
2.18	13	50	3	——	2.74	16	50	3	——
2.19	13	50	3	——	2.75	16	50	3	●
2.2	13	50	3	●	2.76	16	50	3	——
2.21	13	50	3	——	2.77	16	50	3	——
2.22	13	50	3	——	2.78	16	50	3	——
2.23	13	50	3	——	2.79	16	50	3	——
2.24	13	50	3	——	2.8	16	50	3	●
2.25	13	50	3	●	2.81	16	50	3	——
2.26	13	50	3	——	2.82	16	50	3	——
2.27	13	50	3	——	2.83	16	50	3	——
2.28	13	50	3	——	2.84	16	50	3	——
2.29	13	50	3	——	2.85	16	50	3	●
2.3	13	50	3	●	2.86	16	50	3	——
2.31	13	50	3	——	2.87	16	50	3	——
2.32	13	50	3	——	2.88	16	50	3	——
2.33	13	50	3	——	2.89	16	50	3	——
2.34	13	50	3	——	2.9	16	50	3	●
2.35	13	50	3	●	2.91	16	50	3	——
2.36	13	50	3	——	2.92	16	50	3	——
2.37	14	50	3	——	2.93	16	50	3	——
2.38	14	50	3	——	2.94	16	50	3	——
2.39	14	50	3	——	2.95	16	50	3	●
2.4	14	50	3	●	2.96	16	50	3	——
2.41	14	50	3	——	2.97	16	50	3	——
2.42	14	50	3	——	2.98	16	50	3	——
2.43	14	50	3	——	2.99	16	50	3	——
2.44	14	50	3	——	3	16	50	3	●
2.45	14	50	3	●					

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨



Steel < 30HRC

P	H	M	K	N	S
●		●	●	●	

MG Carbide

AlTiCrN HX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D420HX 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		37		37		34		31		37		37		20	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D420HX-1.9	1.9	6,200	0.040	6,200	0.040	5,700	0.040	5,200	0.040	6,200	0.040	6,200	0.060	3350	0.020
D420HX-1.95	1.95	6,000	0.040	6,000	0.040	5,550	0.040	5,050	0.040	6,000	0.040	6,000	0.060	3250	0.020
D420HX-2	2	5,900	0.050	5,900	0.050	5,400	0.050	5,000	0.050	5,900	0.050	5,900	0.060	3150	0.020
D420HX-2.05	2.05	5,750	0.050	5,750	0.050	5,300	0.050	4,800	0.050	5,750	0.050	5,750	0.060	3100	0.020
D420HX-2.1	2.1	5,600	0.050	5,600	0.050	5,150	0.050	4,700	0.050	5,600	0.050	5,600	0.080	3000	0.020
D420HX-2.15	2.15	5,450	0.050	5,450	0.050	5,000	0.050	4,600	0.050	5,450	0.050	5,450	0.080	2950	0.030
D420HX-2.2	2.2	5,350	0.050	5,350	0.050	4,900	0.050	4,500	0.050	5,350	0.050	5,350	0.080	2900	0.030
D420HX-2.25	2.25	5,200	0.060	5,200	0.060	4,800	0.060	4,400	0.060	5,200	0.060	5,200	0.080	2800	0.030
D420HX-2.3	2.3	5,100	0.060	5,100	0.060	4,700	0.060	4,300	0.060	5,100	0.060	5,100	0.080	2750	0.030
D420HX-2.35	2.35	5,000	0.060	5,000	0.060	4,600	0.060	4,200	0.060	5,000	0.060	5,000	0.080	2700	0.030
D420HX-2.4	2.4	4,900	0.060	4,900	0.060	4,500	0.060	4,100	0.060	4,900	0.060	4,900	0.080	2650	0.030
D420HX-2.45	2.45	4,800	0.060	4,800	0.060	4,400	0.060	4,000	0.060	4,800	0.060	4,800	0.080	2600	0.030
D420HX-2.5	2.5	4,700	0.080	4,700	0.080	4,300	0.080	4,332	0.080	4,700	0.080	4,700	0.100	2550	0.040
D420HX-2.55	2.55	4,600	0.080	4,600	0.080	4,250	0.080	3850	0.080	4,600	0.080	4,600	0.100	2500	0.040
D420HX-2.6	2.6	4,500	0.080	4,500	0.080	4,150	0.080	3,800	0.080	4,500	0.080	4,500	0.100	2450	0.040
D420HX-2.65	2.65	4,450	0.080	4,450	0.080	4,050	0.080	3,700	0.080	4,450	0.080	4,450	0.100	2400	0.040
D420HX-2.7	2.7	4,350	0.080	4,350	0.080	4,000	0.080	3,650	0.080	4,350	0.080	4,350	0.100	2350	0.040
D420HX-2.75	2.75	4,300	0.090	4,300	0.090	4,000	0.090	3,600	0.090	4,300	0.090	4,300	0.100	2300	0.050
D420HX-2.8	2.8	4,200	0.090	4,200	0.090	3,800	0.090	3,500	0.090	4,200	0.090	4,200	0.120	2250	0.050
D420HX-2.85	2.85	4,100	0.090	4,100	0.090	3,800	0.090	3,400	0.090	4,100	0.090	4,100	0.120	2200	0.050
D420HX-2.9	2.9	4,050	0.090	4,050	0.090	3,700	0.090	3,400	0.090	4,050	0.090	4,050	0.120	2200	0.050
D420HX-2.95	2.95	4,000	0.090	4,000	0.090	3,650	0.090	3,350	0.090	4,000	0.090	4,000	0.120	2150	0.050
D420HX-3	3	4,000	0.090	4,000	0.090	3,600	0.090	3,300	0.090	4,000	0.090	4,000	0.120	2100	0.050

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D421TX-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D421TX
1	6	50	3	●
1.1	6	50	3	●
1.2	6	50	3	●
1.3	6	50	3	●
1.4	6	50	3	●
1.5	6	50	3	●
1.6	8	50	3	●
1.7	8	50	3	●
1.8	8	50	3	●
1.9	8	50	3	●
2	8	50	3	●
2.1	10	62	3	●
2.2	10	62	3	●
2.3	10	62	3	●
2.4	10	62	3	●
2.5	10	62	3	●
2.6	13	62	3	●
2.7	13	62	3	●
2.8	13	62	3	●
2.9	13	62	3	●
3	13	62	3	●
3.1	19	66	4	●
3.2	19	66	4	●
3.3	19	66	4	●
3.4	19	66	4	●
3.5	19	66	4	●
3.6	21	66	4	●
3.7	21	66	4	●
3.8	21	66	4	●
3.9	21	66	4	●
4	21	66	4	●
4.1	23	66	5	●
4.2	23	66	5	●
4.3	23	66	5	●
4.4	23	66	5	●
4.5	23	66	5	●
4.6	25	66	5	●
4.7	25	66	5	●
4.8	25	66	5	●
4.9	25	66	5	●
5	25	66	5	●
5.1	28	66	6	●
5.2	28	66	6	●
5.3	28	66	6	●
5.4	28	66	6	●
5.5	28	66	6	●
5.6	28	66	6	●
5.7	28	66	6	●
5.8	28	66	6	●
5.9	28	66	6	●
6	28	66	6	●
6.1	34	79	7	●
6.2	34	79	7	●
6.3	34	79	7	●
6.4	34	79	7	●
6.5	34	79	7	●
6.6	34	79	7	●
6.7	34	79	7	●
6.8	34	79	7	●
6.9	34	79	7	●

Dc h7	Lc mm	L mm	d h6	AlTiSiN D421TX
7	34	79	7	●
7.1	41	79	8	●
7.2	41	79	8	●
7.3	41	79	8	●
7.4	41	79	8	●
7.5	41	79	8	●
7.6	41	79	8	●
7.7	41	79	8	●
7.8	41	79	8	●
7.9	41	79	8	●
8	41	79	8	●
8.1	47	89	9	●
8.2	47	89	9	●
8.3	47	89	9	●
8.4	47	89	9	●
8.5	47	89	9	●
8.6	47	89	9	●
8.7	47	89	9	●
8.8	47	89	9	●
8.9	47	89	9	●
9	47	89	9	●
9.1	47	89	10	●
9.2	47	89	10	●
9.3	47	89	10	●
9.4	47	89	10	●
9.5	47	89	10	●
9.6	47	89	10	●
9.7	47	89	10	●
9.8	47	89	10	●
9.9	47	89	10	●
10	47	89	10	●
10.1	55	102	11	●
10.2	55	102	11	●
10.3	55	102	11	●
10.4	55	102	11	●
10.5	55	102	11	●
10.6	55	102	11	●
10.7	55	102	11	●
10.8	55	102	11	●
10.9	55	102	11	●
11	55	102	11	●
11.1	55	102	12	●
11.2	55	102	12	●
11.3	55	102	12	●
11.4	55	102	12	●
11.5	55	102	12	●
11.6	55	102	12	●
11.7	55	102	12	●
11.8	55	102	12	●
11.9	55	102	12	●
12	55	102	12	●
12.5	60	107	13	●
13	60	107	13	●
13.5	60	107	14	●
14	60	107	14	●
14.5	65	115	15	●
15	65	115	15	●
15.5	65	115	16	●
16	65	115	16	●

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D421TX 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D421TX-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D421TX-1.5	1.5	15,000	0.04	15,000	0.04	15,000	0.04	9,800	0.04	8,000	0.04	15,000	0.04
D421TX-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D421TX-2.5	2.5	9,500	0.07	9,500	0.07	9,500	0.07	6,300	0.07	5,000	0.07	9,500	0.07
D421TX-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D421TX-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D421TX-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D421TX-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D421TX-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D421TX-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D421TX-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D421TX-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	2,400	0.14	2,400	0.14	3,950	0.14
D421TX-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D421TX-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,050	0.15	2,050	0.15	3,450	0.15
D421TX-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D421TX-8.5	8.5	3,000	0.16	3,000	0.16	3,000	0.16	1,825	0.16	1,825	0.16	3,000	0.16
D421TX-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D421TX-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D421TX-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D421TX-10.5	10.5	2,420	0.18	2,420	0.18	2,420	0.18	1,525	0.18	1,525	0.18	2,420	0.18
D421TX-11	11	2,320	0.19	2,320	0.19	2,320	0.19	1,450	0.19	1,450	0.19	2,320	0.19
D421TX-11.5	11.5	2,200	0.19	2,200	0.19	2,200	0.19	1,375	0.19	1,375	0.19	2,200	0.19
D421TX-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D421TX-12.5	12.5	2,025	0.20	2,025	0.20	2,025	0.20	1,250	0.20	1,250	0.20	2,025	0.20
D421TX-13	13	1,950	0.21	1,950	0.21	1,950	0.21	1,200	0.21	1,200	0.21	1,950	0.21
D421TX-13.5	13.5	1,875	0.21	1,875	0.21	1,875	0.21	1,150	0.21	1,150	0.21	1,875	0.21
D421TX-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D421TX-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,055	0.22	1,055	0.22	1,750	0.22
D421TX-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D421TX-15.5	15.5	1,650	0.23	1,650	0.23	1,650	0.23	980	0.24	980	0.24	1,650	0.23
D421TX-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D422TX-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D422TX
1	12	62	3	●
1.1	12	62	3	●
1.2	12	62	3	●
1.3	12	62	3	●
1.4	12	62	3	●
1.5	12	62	3	●
1.6	15	62	3	●
1.7	15	62	3	●
1.8	15	62	3	●
1.9	15	62	3	●
2	15	62	3	●
2.1	18	66	3	●
2.2	18	66	3	●
2.3	18	66	3	●
2.4	18	66	3	●
2.5	18	66	3	●
2.6	20	66	3	●
2.7	20	66	3	●
2.8	20	66	3	●
2.9	20	66	3	●
3	20	66	3	●
3.1	24	74	4	●
3.2	24	74	4	●
3.3	24	74	4	●
3.4	24	74	4	●
3.5	24	74	4	●
3.6	28	74	4	●
3.7	28	74	4	●
3.8	28	74	4	●
3.9	28	74	4	●
4	28	74	4	●
4.1	32	74	5	●
4.2	32	74	5	●
4.3	32	74	5	●
4.4	32	74	5	●
4.5	32	74	5	●
4.6	38	74	5	●
4.7	38	74	5	●
4.8	38	74	5	●
4.9	38	74	5	●
5	38	74	5	●
5.1	44	82	6	●
5.2	44	82	6	●
5.3	44	82	6	●
5.4	44	82	6	●
5.5	44	82	6	●
5.6	44	82	6	●
5.7	44	82	6	●
5.8	44	82	6	●
5.9	44	82	6	●
6	44	82	6	●
6.1	53	91	7	●
6.2	53	91	7	●
6.3	53	91	7	●
6.4	53	91	7	●
6.5	53	91	7	●
6.6	53	91	7	●
6.7	53	91	7	●
6.8	53	91	7	●
6.9	53	91	7	●

Dc h7	Lc mm	L mm	d h6	AlTiSiN D422TX
7	53	91	7	●
7.1	53	91	8	●
7.2	53	91	8	●
7.3	53	91	8	●
7.4	53	91	8	●
7.5	53	91	8	●
7.6	53	91	8	●
7.7	53	91	8	●
7.8	53	91	8	●
7.9	53	91	8	●
8	53	91	8	●
8.1	61	103	9	●
8.2	61	103	9	●
8.3	61	103	9	●
8.4	61	103	9	●
8.5	61	103	9	●
8.6	61	103	9	●
8.7	61	103	9	●
8.8	61	103	9	●
8.9	61	103	9	●
9	61	103	9	●
9.1	61	103	10	●
9.2	61	103	10	●
9.3	61	103	10	●
9.4	61	103	10	●
9.5	61	103	10	●
9.6	61	103	10	●
9.7	61	103	10	●
9.8	61	103	10	●
9.9	61	103	10	●
10	61	103	10	●
10.1	71	118	11	●
10.2	71	118	11	●
10.3	71	118	11	●
10.4	71	118	11	●
10.5	71	118	11	●
10.6	71	118	11	●
10.7	71	118	11	●
10.8	71	118	11	●
10.9	71	118	11	●
11	71	118	11	●
11.1	71	118	12	●
11.2	71	118	12	●
11.3	71	118	12	●
11.4	71	118	12	●
11.5	71	118	12	●
11.6	71	118	12	●
11.7	71	118	12	●
11.8	71	118	12	●
11.9	71	118	12	●
12	71	118	12	●
12.5	77	124	13	●
13	77	124	13	●
13.5	77	124	14	●
14	77	124	14	●
14.5	83	133	15	●
15	83	133	15	●
15.5	83	133	16	●
16	83	133	16	●

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D422TX-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D422TX-1.5	1.5	15,000	0.04	15,000	0.04	15,000	0.04	9,800	0.04	8,000	0.04	15,000	0.04
D422TX-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D422TX-2.5	2.5	9,500	0.07	9,500	0.07	9,500	0.07	6,300	0.07	5,000	0.07	9,500	0.07
D422TX-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D422TX-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D422TX-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D422TX-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D422TX-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D422TX-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D422TX-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D422TX-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	2,400	0.14	2,400	0.14	3,950	0.14
D422TX-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D422TX-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,050	0.15	2,050	0.15	3,450	0.15
D422TX-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D422TX-8.5	8.5	3,000	0.16	3,000	0.16	3,000	0.16	1,825	0.16	1,825	0.16	3,000	0.16
D422TX-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D422TX-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D422TX-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D422TX-10.5	10.5	2,420	0.18	2,420	0.18	2,420	0.18	1,525	0.18	1,525	0.18	2,420	0.18
D422TX-11	11	2,320	0.19	2,320	0.19	2,320	0.19	1,450	0.19	1,450	0.19	2,320	0.19
D422TX-11.5	11.5	2,200	0.19	2,200	0.19	2,200	0.19	1,375	0.19	1,375	0.19	2,200	0.19
D422TX-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D422TX-12.5	12.5	2,025	0.20	2,025	0.20	2,025	0.20	1,250	0.20	1,250	0.20	2,025	0.20
D422TX-13	13	1,950	0.21	1,950	0.21	1,950	0.21	1,200	0.21	1,200	0.21	1,950	0.21
D422TX-13.5	13.5	1,875	0.21	1,875	0.21	1,875	0.21	1,150	0.21	1,150	0.21	1,875	0.21
D422TX-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D422TX-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,055	0.22	1,055	0.22	1,750	0.22
D422TX-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D422TX-15.5	15.5	1,650	0.23	1,650	0.23	1,650	0.23	980	0.24	980	0.24	1,650	0.23
D422TX-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

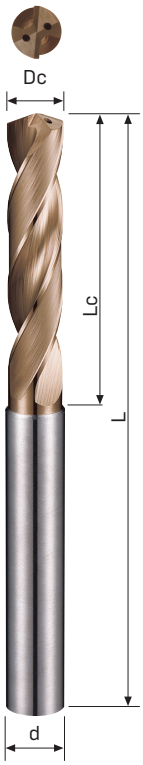
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D423TX-3 超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D423TX-3-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-3
3	18	66	3	●
3.1	20	74	4	●
3.2	20	74	4	●
3.3	20	74	4	●
3.4	20	74	4	●
3.5	20	74	4	●
3.6	23	74	4	●
3.7	23	74	4	●
3.8	23	74	4	●
3.9	23	74	4	●
4	23	74	4	●
4.1	25	80	5	●
4.2	25	80	5	●
4.3	25	80	5	●
4.4	25	80	5	●
4.5	25	80	5	●
4.6	28	80	5	●
4.7	28	80	5	●
4.8	28	80	5	●
4.9	28	80	5	●
5	28	80	5	●
5.1	28	82	6	●
5.2	28	82	6	●
5.3	28	82	6	●
5.4	28	82	6	●
5.5	28	82	6	●
5.6	30	82	6	●
5.7	30	82	6	●
5.8	30	82	6	●
5.9	30	82	6	●
6	30	82	6	●
6.1	33	88	7	●
6.2	33	88	7	●
6.3	33	88	7	●
6.4	33	88	7	●
6.5	33	88	7	●
6.6	35	88	7	●
6.7	35	88	7	●
6.8	35	88	7	●
6.9	35	88	7	●
7	35	88	7	●
7.1	38	91	8	●
7.2	38	91	8	●
7.3	38	91	8	●
7.4	38	91	8	●
7.5	38	91	8	●
7.6	40	91	8	●
7.7	40	91	8	●
7.8	40	91	8	●
7.9	40	91	8	●
8	40	91	8	●
8.1	43	100	9	●
8.2	43	100	9	●
8.3	43	100	9	●
8.4	43	100	9	●
8.5	43	100	9	●
8.6	45	100	9	●
8.7	45	100	9	●
8.8	45	100	9	●
8.9	45	100	9	●
9	45	100	9	●
9.1	48	103	10	●
9.2	48	103	10	●
9.3	48	103	10	●
9.4	48	103	10	●
9.5	48	103	10	●
9.6	50	103	10	●
9.7	50	103	10	●
9.8	50	103	10	●
9.9	50	103	10	●
10	50	103	10	●
10.1	53	116	11	●
10.2	53	116	11	●
10.3	53	116	11	●
10.4	53	116	11	●
10.5	53	116	11	●
10.6	55	116	11	●
10.7	55	116	11	●
10.8	55	116	11	●
10.9	55	116	11	●
11	55	116	11	●
11.1	58	118	12	●
11.2	58	118	12	●
11.3	58	118	12	●
11.4	58	118	12	●
11.5	58	118	12	●
11.6	60	118	12	●
11.7	60	118	12	●
11.8	60	118	12	●
11.9	60	118	12	●
12	60	118	12	●
12.5	63	128	13	●
13	65	128	13	●
13.5	68	134	14	●
14	70	134	14	●
14.5	73	140	15	●
15	75	140	15	●
15.5	78	146	16	●
16	80	146	16	●



Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D423TX-3 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D423TX-3-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-3-3.5	3.5	11,250	0.09	11,250	0.09	11,500	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-3-4	4	9,500	0.10	9,500	0.10	10,000	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-3-4.5	4.5	8,550	0.11	8,550	0.11	9,000	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-3-5	5	7,600	0.12	7,600	0.12	8,000	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-3-5.5	5.5	7,000	0.13	7,000	0.13	7,300	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-3-6	6	6,400	0.14	6,400	0.14	6,600	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-3-6.5	6.5	6,000	0.14	6,000	0.14	6,200	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-3-7	7	5,600	0.15	5,600	0.15	5,800	0.15	2,800	0.15	2,300	0.13	2,800	0.15	5,600	0.15
D423TX-3-7.5	7.5	5,200	0.15	5,200	0.15	5,400	0.15	2,600	0.15	2,150	0.13	2,600	0.15	5,200	0.15
D423TX-3-8	8	4,800	0.16	4,800	0.16	5,000	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-3-8.5	8.5	4,550	0.16	4,550	0.16	4,750	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-3-9	9	4,300	0.17	4,300	0.17	4,500	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-3-9.5	9.5	4,050	0.17	4,050	0.17	4,250	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-3-10	10	3,800	0.18	3,800	0.18	4,000	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-3-10.5	10.5	3,650	0.18	3,650	0.18	3,800	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-3-11	11	3,500	0.19	3,500	0.19	3,650	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-3-11.5	11.5	3,350	0.19	3,350	0.19	3,450	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-3-12	12	3,200	0.20	3,200	0.20	3,300	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-3-12.5	12.5	3,075	0.20	3,075	0.20	3,175	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-3-13	13	2,950	0.21	2,950	0.21	3,050	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-3-13.5	13.5	2,775	0.21	2,775	0.21	2,975	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-3-14	14	2,700	0.22	2,700	0.22	2,800	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-3-14.5	14.5	2,625	0.23	2,625	0.23	2,725	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-3-15	15	2,550	0.24	2,550	0.24	2,650	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-3-15.5	15.5	2,475	0.24	2,475	0.24	2,575	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-3-16	16	2,400	0.25	2,400	0.25	2,500	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D423TX-5 超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D423TX-5-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-5
3	28	78	3	●
3.1	32	86	4	●
3.2	32	86	4	●
3.3	32	86	4	●
3.4	32	86	4	●
3.5	32	86	4	●
3.6	36	86	4	●
3.7	36	86	4	●
3.8	36	86	4	●
3.9	36	86	4	●
4	36	86	4	●
4.1	40	95	5	●
4.2	40	95	5	●
4.3	40	95	5	●
4.4	40	95	5	●
4.5	40	95	5	●
4.6	44	95	5	●
4.7	44	95	5	●
4.8	44	95	5	●
4.9	44	95	5	●
5	44	95	5	●
5.1	44	97	6	●
5.2	44	97	6	●
5.3	44	97	6	●
5.4	44	97	6	●
5.5	44	97	6	●
5.6	48	97	6	●
5.7	48	97	6	●
5.8	48	97	6	●
5.9	48	97	6	●
6	48	97	6	●
6.1	52	109	7	●
6.2	52	109	7	●
6.3	52	109	7	●
6.4	52	109	7	●
6.5	52	109	7	●
6.6	56	109	7	●
6.7	56	109	7	●
6.8	56	109	7	●
6.9	56	109	7	●
7	56	109	7	●
7.1	60	116	8	●
7.2	60	116	8	●
7.3	60	116	8	●
7.4	60	116	8	●
7.5	60	116	8	●
7.6	64	116	8	●
7.7	64	116	8	●
7.8	64	116	8	●
7.9	64	116	8	●
8	64	116	8	●
8.1	68	127	9	●
8.2	68	127	9	●
8.3	68	127	9	●
8.4	68	127	9	●
8.5	68	127	9	●
8.6	72	127	9	●
8.7	72	127	9	●
8.8	72	127	9	●
8.9	72	127	9	●
9	72	127	9	●
9.1	76	139	10	●
9.2	76	139	10	●
9.3	76	139	10	●
9.4	76	139	10	●
9.5	76	139	10	●
9.6	80	139	10	●
9.7	80	139	10	●
9.8	80	139	10	●
9.9	80	139	10	●
10	80	139	10	●
10.1	84	149	11	●
10.2	84	149	11	●
10.3	84	149	11	●
10.4	84	149	11	●
10.5	84	149	11	●
10.6	88	149	11	●
10.7	88	149	11	●
10.8	88	149	11	●
10.9	88	149	11	●
11	88	149	11	●
11.1	92	163	12	●
11.2	92	163	12	●
11.3	92	163	12	●
11.4	92	163	12	●
11.5	92	163	12	●
11.6	96	163	12	●
11.7	96	163	12	●
11.8	96	163	12	●
11.9	96	163	12	●
12	96	163	12	●
12.5	100	167	13	●
13	104	167	13	●
13.5	108	176	14	●
14	112	176	14	●
14.5	116	185	15	●
15	120	185	15	●
15.5	124	194	16	●
16	128	194	16	●

Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D423TX-5 切削條件參考表

Recommended Milling Conditions

Borehole parameters　鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D423TX-5-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-5-3.5	3.5	11,250	0.09	11,250	0.09	11,500	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-5-4	4	9,500	0.10	9,500	0.10	10,000	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-5-4.5	4.5	8,550	0.11	8,550	0.11	9,000	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-5-5	5	7,600	0.12	7,600	0.12	8,000	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-5-5.5	5.5	7,000	0.13	7,000	0.13	7,300	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-5-6	6	6,400	0.14	6,400	0.14	6,600	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-5-6.5	6.5	6,000	0.14	6,000	0.14	6,200	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-5-7	7	5,600	0.15	5,600	0.15	5,800	0.15	2,800	0.15	2,300	0.13	2,800	0.15	5,600	0.15
D423TX-5-7.5	7.5	5,200	0.15	5,200	0.15	5,400	0.15	2,600	0.15	2,150	0.13	2,600	0.15	5,200	0.15
D423TX-5-8	8	4,800	0.16	4,800	0.16	5,000	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-5-8.5	8.5	4,550	0.16	4,550	0.16	4,750	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-5-9	9	4,300	0.17	4,300	0.17	4,500	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-5-9.5	9.5	4,050	0.17	4,050	0.17	4,250	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-5-10	10	3,800	0.18	3,800	0.18	4,000	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-5-10.5	10.5	3,650	0.18	3,650	0.18	3,800	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-5-11	11	3,500	0.19	3,500	0.19	3,650	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-5-11.5	11.5	3,350	0.19	3,350	0.19	3,450	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-5-12	12	3,200	0.20	3,200	0.20	3,300	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-5-12.5	12.5	3,075	0.20	3,075	0.20	3,175	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-5-13	13	2,950	0.21	2,950	0.21	3,050	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-5-13.5	13.5	2,775	0.21	2,775	0.21	2,975	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-5-14	14	2,700	0.22	2,700	0.22	2,800	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-5-14.5	14.5	2,625	0.23	2,625	0.23	2,725	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-5-15	15	2,550	0.24	2,550	0.24	2,650	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-5-15.5	15.5	2,475	0.24	2,475	0.24	2,575	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-5-16	16	2,400	0.25	2,400	0.25	2,500	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D423TX-8 超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D423TX-8-Dc

Dc h7	Lc mm	L mm	d h6	AlTiSiN D423TX-8
3	31	80	3	●
3.1	39	95	4	●
3.2	39	95	4	●
3.3	39	95	4	●
3.4	39	95	4	●
3.5	39	95	4	●
3.6	44	95	4	●
3.7	44	95	4	●
3.8	44	95	4	●
3.9	44	95	4	●
4	44	95	4	●
4.1	50	105	5	●
4.2	50	105	5	●
4.3	50	105	5	●
4.4	50	105	5	●
4.5	50	105	5	●
4.6	55	105	5	●
4.7	55	105	5	●
4.8	55	105	5	●
4.9	55	105	5	●
5	55	105	5	●
5.1	61	118	6	●
5.2	61	118	6	●
5.3	61	118	6	●
5.4	61	118	6	●
5.5	61	118	6	●
5.6	66	118	6	●
5.7	66	118	6	●
5.8	66	118	6	●
5.9	66	118	6	●
6	66	118	6	●
6.1	72	130	7	●
6.2	72	130	7	●
6.3	72	130	7	●
6.4	72	130	7	●
6.5	72	130	7	●
6.6	77	130	7	●
6.7	77	130	7	●
6.8	77	130	7	●
6.9	77	130	7	●
7	77	130	7	●
7.1	83	142	8	●
7.2	83	142	8	●
7.3	83	142	8	●
7.4	83	142	8	●
7.5	83	142	8	●
7.6	88	142	8	●
7.7	88	142	8	●
7.8	88	142	8	●
7.9	88	142	8	●
8	88	142	8	●
8.1	94	154	9	●
8.2	94	154	9	●
8.3	94	154	9	●
8.4	94	154	9	●
8.5	94	154	9	●
8.6	99	154	9	●
8.7	99	154	9	●
8.8	99	154	9	●
8.9	99	154	9	●
9	99	154	9	●
9.1	105	166	10	●
9.2	105	166	10	●
9.3	105	166	10	●
9.4	105	166	10	●
9.5	105	166	10	●
9.6	110	166	10	●
9.7	110	166	10	●
9.8	110	166	10	●
9.9	110	166	10	●
10	110	166	10	●
10.1	116	182	11	●
10.2	116	182	11	●
10.3	116	182	11	●
10.4	116	182	11	●
10.5	116	182	11	●
10.6	121	182	11	●
10.7	121	182	11	●
10.8	121	182	11	●
10.9	121	182	11	●
11	121	182	11	●
11.1	127	194	12	●
11.2	127	194	12	●
11.3	127	194	12	●
11.4	127	194	12	●
11.5	127	194	12	●
11.6	132	194	12	●
11.7	132	194	12	●
11.8	132	194	12	●
11.9	132	194	12	●
12	132	194	12	●
12.5	138	206	13	●
13	143	206	13	●
13.5	149	218	14	●
14	154	218	14	●
14.5	160	230	15	●
15	165	230	15	●
15.5	171	242	16	●
16	176	242	16	●

Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D423TX-8 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D423TX-8-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D423TX-8-3.5	3.5	11,250	0.09	11,250	0.09	11,500	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D423TX-8-4	4	9,500	0.10	9,500	0.10	10,000	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D423TX-8-4.5	4.5	8,550	0.11	8,550	0.11	9,000	0.11	4,300	0.11	3,600	0.09	4,250	0.11	8,550	0.11
D423TX-8-5	5	7,600	0.12	7,600	0.12	8,000	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D423TX-8-5.5	5.5	7,000	0.13	7,000	0.13	7,300	0.13	3,500	0.13	2,900	0.11	3,500	0.13	7,000	0.13
D423TX-8-6	6	6,400	0.14	6,400	0.14	6,600	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D423TX-8-6.5	6.5	6,000	0.14	6,000	0.14	6,200	0.14	3,000	0.14	2,450	0.12	3,000	0.14	6,000	0.14
D423TX-8-7	7	5,600	0.15	5,600	0.15	5,800	0.15	2,800	0.15	2,300	0.13	2,800	0.15	5,600	0.15
D423TX-8-7.5	7.5	5,200	0.15	5,200	0.15	5,400	0.15	2,600	0.15	2,150	0.13	2,600	0.15	5,200	0.15
D423TX-8-8	8	4,800	0.16	4,800	0.16	5,000	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D423TX-8-8.5	8.5	4,550	0.16	4,550	0.16	4,750	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D423TX-8-9	9	4,300	0.17	4,300	0.17	4,500	0.17	2,150	0.17	1,800	0.15	2,150	0.17	4,300	0.17
D423TX-8-9.5	9.5	4,050	0.17	4,050	0.17	4,250	0.17	2,025	0.17	1,700	0.15	2,025	0.17	4,050	0.17
D423TX-8-10	10	3,800	0.18	3,800	0.18	4,000	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D423TX-8-10.5	10.5	3,650	0.18	3,650	0.18	3,800	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D423TX-8-11	11	3,500	0.19	3,500	0.19	3,650	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D423TX-8-11.5	11.5	3,350	0.19	3,350	0.19	3,450	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D423TX-8-12	12	3,200	0.20	3,200	0.20	3,300	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D423TX-8-12.5	12.5	3,075	0.20	3,075	0.20	3,175	0.20	1,535	0.20	1,275	0.17	1,535	0.20	3,075	0.20
D423TX-8-13	13	2,950	0.21	2,950	0.21	3,050	0.21	1,475	0.21	1,250	0.18	1,475	0.21	2,950	0.21
D423TX-8-13.5	13.5	2,775	0.21	2,775	0.21	2,975	0.21	1,400	0.21	1,225	0.18	1,400	0.21	2,775	0.21
D423TX-8-14	14	2,700	0.22	2,700	0.22	2,800	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D423TX-8-14.5	14.5	2,625	0.23	2,625	0.23	2,725	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D423TX-8-15	15	2,550	0.24	2,550	0.24	2,650	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D423TX-8-15.5	15.5	2,475	0.24	2,475	0.24	2,575	0.24	1,235	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D423TX-8-16	16	2,400	0.25	2,400	0.25	2,500	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

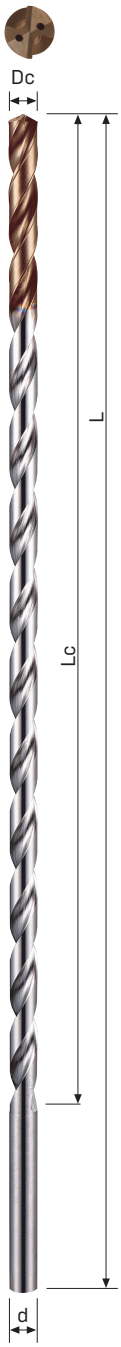
D423TX-12 / 16 超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D423TX-12-Dc / D423TX-16-Dc

Dc h7	Lc mm	L mm	d h6	12XD D423TX-12	Dc h7	Lc mm	L mm	d h6	16XD D423TX-16
3	51	99	3	●	3	60	108	3	●
3.1	60	108	4	●	3.1	70	118	4	●
3.2	60	108	4	●	3.2	70	118	4	●
3.3	60	108	4	●	3.3	70	118	4	●
3.4	60	108	4	●	3.4	70	118	4	●
3.5	60	108	4	●	3.5	70	118	4	●
3.6	68	116	4	●	3.6	80	128	4	●
3.7	68	116	4	●	3.7	80	128	4	●
3.8	68	116	4	●	3.8	80	128	4	●
3.9	68	116	4	●	3.9	80	128	4	●
4	68	116	4	●	4	80	128	4	●
4.1	77	127	5	●	4.1	90	140	5	●
4.2	77	127	5	●	4.2	90	140	5	●
4.3	77	127	5	●	4.3	90	140	5	●
4.4	77	127	5	●	4.4	90	140	5	●
4.5	77	127	5	●	4.5	90	140	5	●
4.6	85	135	5	●	4.6	100	150	5	●
4.7	85	135	5	●	4.7	100	150	5	●
4.8	85	135	5	●	4.8	100	150	5	●
4.9	85	135	5	●	4.9	100	150	5	●
5	85	135	5	●	5	100	150	5	●
5.1	94	146	6	●	5.1	110	162	6	●
5.2	94	146	6	●	5.2	110	162	6	●
5.3	94	146	6	●	5.3	110	162	6	●
5.4	94	146	6	●	5.4	110	162	6	●
5.5	94	146	6	●	5.5	110	162	6	●
5.6	102	154	6	●	5.6	120	172	6	●
5.7	102	154	6	●	5.7	120	172	6	●
5.8	102	154	6	●	5.8	120	172	6	●
5.9	102	154	6	●	5.9	120	172	6	●
6	102	154	6	●	6	120	172	6	●
6.1	111	164	7	●	6.1	130	183	7	●
6.2	111	164	7	●	6.2	130	183	7	●
6.3	111	164	7	●	6.3	130	183	7	●
6.4	111	164	7	●	6.4	130	183	7	●
6.5	111	164	7	●	6.5	130	183	7	●
6.6	119	172	7	●	6.6	140	193	7	●
6.7	119	172	7	●	6.7	140	193	7	●
6.8	119	172	7	●	6.8	140	193	7	●
6.9	119	172	7	●	6.9	140	193	7	●
7	119	172	7	●	7	140	193	7	●
7.1	128	182	8	●	7.1	150	204	8	●
7.2	128	182	8	●	7.2	150	204	8	●
7.3	128	182	8	●	7.3	150	204	8	●
7.4	128	182	8	●	7.4	150	204	8	●
7.5	128	182	8	●	7.5	150	204	8	●
7.6	136	190	8	●	7.6	160	214	8	●
7.7	136	190	8	●	7.7	160	214	8	●
7.8	136	190	8	●	7.8	160	214	8	●
7.9	136	190	8	●	7.9	160	214	8	●
8	136	190	8	●	8	160	214	8	●
8.5	145	200	9	●	8.5	170	225	9	●
9	153	208	9	●	9	180	235	9	●
9.5	162	218	10	●	9.5	190	246	10	●
10	170	226	10	●	10	200	256	10	●
10.5	179	240	11	●	10.5	210	271	11	●
11	187	248	11	●	11	220	281	11	●
11.5	196	258	12	●	11.5	230	292	12	●
12	204	266	12	●	12	240	302	12	●

※Out of stock, in production ※庫存建立中，沒有現貨



Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~125		60~125		60~125		40~80		40~80		50~80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D423TX-12-16-3	3	7,500	0.06	7,500	0.06	7,500	0.06	5,300	0.06	5,300	0.06	5,300	0.06
D423TX-12-16-3.5	3.5	6,950	0.07	6,950	0.07	6,950	0.07	5,150	0.07	5,150	0.07	5,150	0.07
D423TX-12-16-4	4	6,400	0.08	6,400	0.08	6,400	0.08	5,000	0.08	5,000	0.08	5,000	0.08
D423TX-12-16-4.5	4.5	6,100	0.09	6,100	0.09	6,100	0.09	4,750	0.09	4,750	0.09	4,750	0.09
D423TX-12-16-5	5	5,800	0.10	5,800	0.10	5,800	0.10	4,500	0.10	4,500	0.10	4,500	0.10
D423TX-12-16-5.5	5.5	5,300	0.11	5,300	0.11	5,300	0.11	4,150	0.11	4,150	0.11	4,150	0.11
D423TX-12-16-6	6	4,800	0.12	4,800	0.12	4,800	0.12	3,800	0.12	3,800	0.12	3,800	0.12
D423TX-12-16-6.5	6.5	4,500	0.13	4,500	0.13	4,500	0.13	3,550	0.13	3,550	0.13	3,550	0.13
D423TX-12-16-7	7	4,200	0.14	4,200	0.14	4,200	0.14	3,300	0.14	3,300	0.14	3,300	0.14
D423TX-12-16-7.5	7.5	3,900	0.15	3,900	0.15	3,900	0.15	3,050	0.15	3,050	0.15	3,050	0.15
D423TX-12-16-8	8	3,600	0.16	3,600	0.16	3,600	0.16	2,800	0.16	2,800	0.16	2,800	0.16
D423TX-12-16-8.5	8.5	3,410	0.17	3,410	0.17	3,410	0.17	2,675	0.17	2,675	0.17	2,675	0.17
D423TX-12-16-9	9	3,250	0.18	3,250	0.18	3,250	0.18	2,550	0.18	2,550	0.18	2,550	0.18
D423TX-12-16-9.5	9.5	3,060	0.19	3,060	0.19	3,060	0.19	2,425	0.19	2,425	0.19	2,425	0.19
D423TX-12-16-10	10	2,900	0.20	2,900	0.20	2,900	0.20	2,300	0.20	2,300	0.20	2,300	0.20
D423TX-12-16-10.5	10.5	2,775	0.21	2,775	0.21	2,775	0.21	2,200	0.21	2,200	0.21	2,200	0.21
D423TX-12-16-11	11	2,650	0.22	2,650	0.22	2,650	0.22	2,100	0.22	2,100	0.22	2,100	0.22
D423TX-12-16-11.5	11.5	2,525	0.23	2,525	0.23	2,525	0.23	2,000	0.23	2,000	0.23	2,000	0.23
D423TX-12-16-12	12	2,400	0.24	2,400	0.24	2,400	0.24	1,900	0.24	1,900	0.24	1,900	0.24

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D423TX-20 / 25 / 30 超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D423TX-20-Dc
D423TX-25-Dc

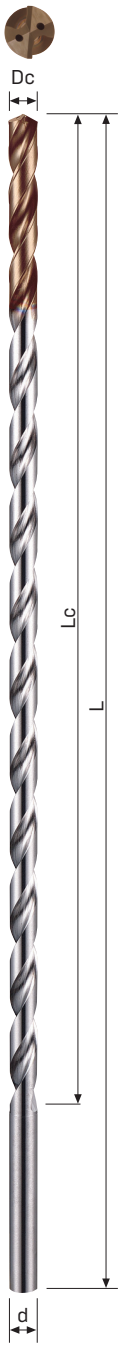
Dc h7	Lc mm	L mm	d h6	20XD D423TX-20	Dc h7	Lc mm	L mm	d h6	25XD D423TX-25
3	75	123	3	●	3	90	138	3	——
3.1	88	136	4	●	3.5	105	153	4	——
3.2	88	136	4	●	4	120	168	4	——
3.3	88	136	4	●	4.5	135	185	5	——
3.4	88	136	4	●	5	150	200	5	——
3.5	88	136	4	●	5.5	165	217	6	——
3.6	100	148	4	●	6	180	232	6	——
3.7	100	148	4	●	6.5	195	248	7	——
3.8	100	148	4	●	7	210	263	7	——
3.9	100	148	4	●	7.5	225	279	8	——
4	100	148	4	●	8	240	294	8	——
4.1	113	163	5	●	8.5	255	310	9	——
4.2	113	163	5	●	9	270	325	9	——
4.3	113	163	5	●	9.5	285	341	10	——
4.4	113	163	5	●	10	300	356	10	——
4.5	113	163	5	●	10.5	315	376	11	——
4.6	125	175	5	●	11	330	391	11	——
4.7	125	175	5	●	11.5	345	407	12	——
4.8	125	175	5	●	12	360	422	12	——
4.9	125	175	5	●					
5	125	175	5	●					
5.1	140	192	6	●					
5.2	140	192	6	●					
5.3	140	192	6	●					
5.4	140	192	6	●					
5.5	140	192	6	●					
5.6	150	202	6	●					
5.7	150	202	6	●					
5.8	150	202	6	●					
5.9	150	202	6	●					
6	150	202	6	●					
6.1	163	216	7	●					
6.2	163	216	7	●					
6.3	163	216	7	●					
6.4	163	216	7	●					
6.5	163	216	7	●					
6.6	175	228	7	●					
6.7	175	228	7	●					
6.8	175	228	7	●					
6.9	175	228	7	●					
7	175	228	7	●					
7.1	188	242	8	●					
7.2	188	242	8	●					
7.3	188	242	8	●					
7.4	188	242	8	●					
7.5	188	242	8	●					
7.6	200	254	8	●					
7.7	200	254	8	●					
7.8	200	254	8	●					
7.9	200	254	8	●					
8	200	254	8	●					
8.5	213	268	9	●					
9	225	280	9	●					
9.5	238	294	10	●					
10	250	306	10	●					
10.5	263	324	11	——					
11	275	336	11	——					
11.5	288	350	12	——					
12	300	362	12	——					

Code No. D423TX-30-Dc

Dc h7	Lc mm	L mm	d h6	30XD D423TX-30
3	105	153	3	——
3.5	123	171	4	——
4	140	188	4	——
4.5	158	208	5	——
5	175	225	5	——
5.5	193	245	6	——
6	210	262	6	——
6.5	228	281	7	——
7	245	298	7	——
7.5	263	317	8	——
8	280	334	8	——
8.5	298	353	9	——
9	315	370	9	——
9.5	333	389	10	——
10	350	406	10	——
10.5	368	429	11	——
11	385	446	11	——
11.5	403	465	12	——
12	420	482	12	——

※ Mark: ——, Have not produced yet, no stock
※Out of stock, in production

※記號 ——，尚未製造，無庫存
※庫存建立中，沒有現貨



Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

MG Carbide

AlTiSiN TX

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D423TX-20 / 25 / 30 切削條件參考表

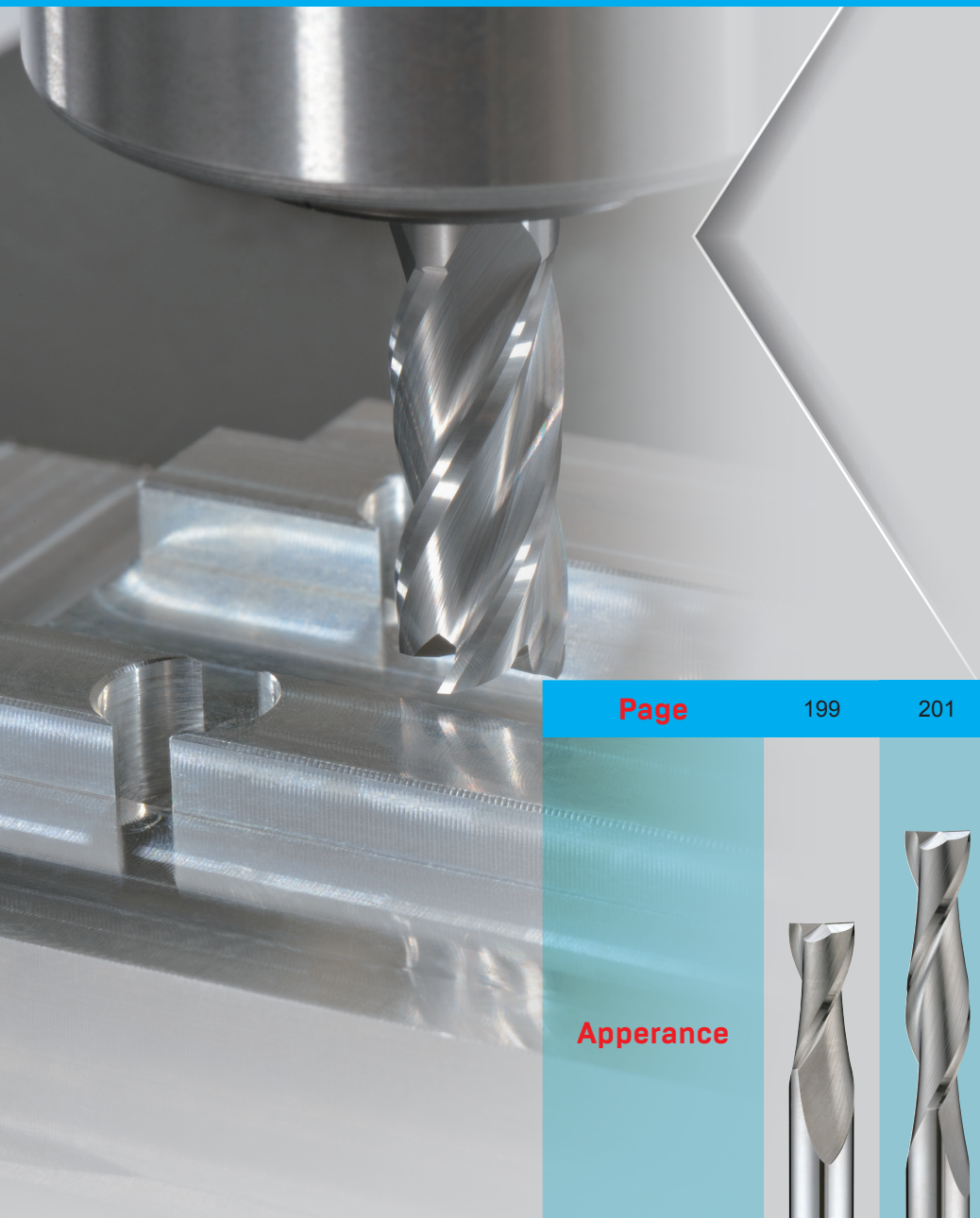
Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~125		60~125		60~125		40~80		40~80		50~80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D423TX-20-25-30-3	3	7,500	0.06	7,500	0.06	7,500	0.06	5,300	0.06	5,300	0.06	5,300	0.06
D423TX-20-25-30-3.5	3.5	6,950	0.07	6,950	0.07	6,950	0.07	5,150	0.07	5,150	0.07	5,150	0.07
D423TX-20-25-30-4	4	6,400	0.08	6,400	0.08	6,400	0.08	5,000	0.08	5,000	0.08	5,000	0.08
D423TX-20-25-30-4.5	4.5	6,100	0.09	6,100	0.09	6,100	0.09	4,750	0.09	4,750	0.09	4,750	0.09
D423TX-20-25-30-5	5	5,800	0.10	5,800	0.10	5,800	0.10	4,500	0.10	4,500	0.10	4,500	0.10
D423TX-20-25-30-5.5	5.5	5,300	0.11	5,300	0.11	5,300	0.11	4,150	0.11	4,150	0.11	4,150	0.11
D423TX-20-25-30-6	6	4,800	0.12	4,800	0.12	4,800	0.12	3,800	0.12	3,800	0.12	3,800	0.12
D423TX-20-25-30-6.5	6.5	4,500	0.13	4,500	0.13	4,500	0.13	3,550	0.13	3,550	0.13	3,550	0.13
D423TX-20-25-30-7	7	4,200	0.14	4,200	0.14	4,200	0.14	3,300	0.14	3,300	0.14	3,300	0.14
D423TX-20-25-30-7.5	7.5	3,900	0.15	3,900	0.15	3,900	0.15	3,050	0.15	3,050	0.15	3,050	0.15
D423TX-20-25-30-8	8	3,600	0.16	3,600	0.16	3,600	0.16	2,800	0.16	2,800	0.16	2,800	0.16
D423TX-20-25-30-8.5	8.5	3,410	0.17	3,410	0.17	3,410	0.17	2,675	0.17	2,675	0.17	2,675	0.17
D423TX-20-25-30-9	9	3,250	0.18	3,250	0.18	3,250	0.18	2,550	0.18	2,550	0.18	2,550	0.18
D423TX-20-25-30-9.5	9.5	3,060	0.19	3,060	0.19	3,060	0.19	2,425	0.19	2,425	0.19	2,425	0.19
D423TX-20-25-30-10	10	2,900	0.20	2,900	0.20	2,900	0.20	2,300	0.20	2,300	0.20	2,300	0.20
D423TX-20-25-30-10.5	10.5	2,775	0.21	2,775	0.21	2,775	0.21	2,200	0.21	2,200	0.21	2,200	0.21
D423TX-20-25-30-11	11	2,650	0.22	2,650	0.22	2,650	0.22	2,100	0.22	2,100	0.22	2,100	0.22
D423TX-20-25-30-11.5	11.5	2,525	0.23	2,525	0.23	2,525	0.23	2,000	0.23	2,000	0.23	2,000	0.23
D423TX-20-25-30-12	12	2,400	0.24	2,400	0.24	2,400	0.24	1,900	0.24	1,900	0.24	1,900	0.24

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



立銑刀
Drills

Page	199	201	203	205	207	209
Apperance						
Code No	E172	E182 E185 E187	E174	E184 E186 E188	B212	B280 B282
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank
Helix Angle	30°	30°	30°	30°	30°	30°
No.of Flutes	2	2	4	4	2	2

美標
ANSI

7leaders®
The Art of Cutting

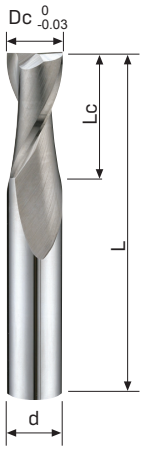
211	213	215	217	219	219
					
B214	B281 B284	E133	E135 E136 E137	E192	E193
MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank
 30°	 30°	 30°	 30°	 30°	 30°
 4	 4	 3	 3	 2	 3

Code No.E172-Dc

Dc $^{0}_{-0.03}$	Lc mm	L mm	d h6	Blank E172	TiAlN E172F
0.2	0.5	38	3	●	——
0.3	0.8	38	3	●	——
0.4	1	38	3	●	——
0.5	1.2	38	3	●	——
0.6	1.5	38	3	●	——
0.7	1.8	38	3	●	——
0.8	2	38	3	●	——
0.9	2.5	38	3	●	——
1	3	38	3	●	——
1.5	5	38	3	●	——
2	6	38	3	●	——
2.5	7	38	3	●	——
3	9	38	3	●	——
3.5	12	50	4	●	——
4	14	50	4	●	——
4.5	14	50	5	●	——
5	16	50	5	●	——
5.5	16	50	6	●	——
6	20	63	6	●	——
6.5	20	63	8	●	——
7	20	63	8	●	——
7.5	20	63	8	●	——
8	20	63	8	●	——
8.5	22	72	10	●	——
9	22	72	10	●	——
9.5	22	72	10	●	——
10	22	72	10	●	——
11	26	75	12	●	——
12	26	75	12	●	——
13	32	89	14	●	——
14	32	89	14	●	——
15	32	89	16	●	——
16	32	89	16	●	——
17	38	100	18	●	——
18	38	100	18	●	——
20	38	100	20	●	——

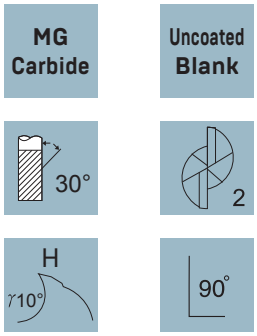
※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨

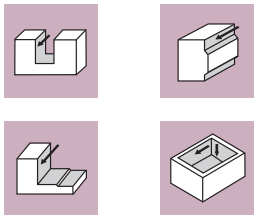


Steel < 30HRC

P	H	M	K	N	S
●			○	●	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting　溝切削

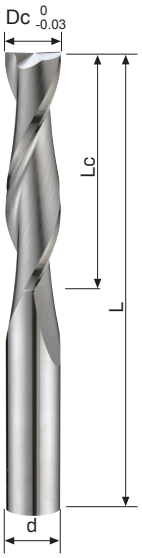
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		40		40		34		100		40		34	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E172-0.2	0.2	25,000	30	25,000	30	22,000	25	32,000	35	25,000	30	22,000	25
E172-0.3	0.3	25,000	50	25,000	50	22,000	40	32,000	70	25,000	50	22,000	40
E172-0.5	0.5	25,000	50	25,000	50	22,000	40	32,000	80	25,000	50	22,000	40
E172-0.6	0.6	25,000	50	25,000	50	22,000	40	32,000	80	25,000	50	22,000	40
E172-0.8	0.8	25,000	50	25,000	50	22,000	40	32,000	80	25,000	50	22,000	40
E172-0.9	0.9	25,000	95	25,000	95	22,000	40	32,000	80	25,000	95	22,000	40
E172-1	1	12,500	95	12,500	95	10,500	40	31,500	200	12,500	95	10,500	40
E172-1.5	1.5	8,450	95	8,450	95	7,200	40	21,000	200	8,450	95	7,200	40
E172-2	2	6,350	95	6,350	95	5,400	40	15,500	200	6,350	95	5,400	40
E172-2.5	2.5	6,350	125	6,350	125	5,400	80	15,500	300	6,350	125	5,400	80
E172-3	3	4,200	125	4,200	125	3,600	80	10,500	300	4,200	125	3,600	80
E172-3.5	3.5	3,650	125	3,650	125	3,150	80	9,220	300	3,650	125	3,150	80
E172-4	4	3,150	125	3,150	125	2,700	80	7,950	300	3,150	125	2,700	80
E172-4.5	4.5	2,800	125	2,800	125	2,400	80	7,150	300	2,800	125	2,400	80
E172-5	5	2,500	125	2,500	125	2,150	80	6,350	300	2,500	125	2,150	80
E172-5.5	5.5	2,300	125	2,300	125	1,960	80	5,800	300	2,300	125	1,960	80
E172-6	6	2,100	125	2,100	125	1,800	80	5,300	300	2,100	125	1,800	80
E172-7	7	1,800	125	1,800	125	1,575	80	4,650	300	1,800	125	1,575	80
E172-8	8	1,550	125	1,550	125	1,350	80	3,950	300	1,550	125	1,350	80
E172-9	9	1,400	125	1,400	125	1,150	80	3,550	300	1,400	125	1,150	80
E172-10	10	1,250	125	1,250	125	1,050	80	3,150	300	1,250	125	1,050	80
E172-11	11	1,150	125	1,150	125	975	80	2,900	300	1,150	125	975	80
E172-12	12	1,050	125	1,050	125	900	80	2,650	300	1,050	125	900	80
E172-13	13	975	125	975	125	830	80	2,450	300	975	125	830	80
E172-14	14	900	125	900	125	770	80	2,250	300	900	125	770	80
E172-15	15	850	135	850	135	720	90	2,100	300	850	135	720	90
E172-16	16	800	150	800	150	675	100	1,950	300	800	150	675	100
E172-17	17	750	150	750	150	635	100	1,850	300	750	150	635	100
E172-18	18	705	150	705	150	600	100	1,750	300	705	150	600	100
E172-20	20	635	150	635	150	540	100	1,550	300	635	150	540	100
切入深度 （mm）		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D		Dc<Ø1 AP=0.1D Dc<Ø3 AP=0.3D Dc>Ø3 AP=0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

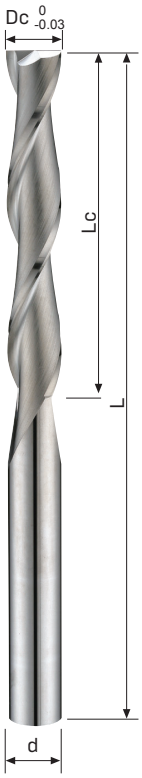
Code No. E182-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E182	TiAlN E182F
3	20	57	3	●	——
4	20	57	4	●	——
5	25	63	5	●	——
6	28	75	6	●	——
7	30	75	8	●	——
8	30	75	8	●	——
9	32	75	10	●	——
10	32	75	10	●	——
12	50	100	12	●	——
14	57	127	14	●	——
16	57	127	16	●	——
20	57	127	20	●	——



Code No. E185-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E185	TiAlN E185F
3	25	75	3	●	——
4	28	75	4	●	——
5	32	75	5	●	——
6	38	100	6	●	——
8	42	100	8	●	——
10	45	100	10	●	——
12	75	150	12	●	——
14	80	150	14	●	——
16	80	150	16	●	——
20	80	150	20	●	——



Code No. E187-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E187	TiAlN E187F
5	45	100	6	●	——
6	50	100	6	●	——
8	75	150	8	●	——
10	75	150	10	●	——
12	75	200	12	●	——
16	80	200	16	●	——
20	80	200	20	●	——

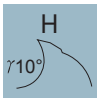
※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨

Steel < 30HRC

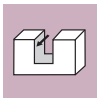
P	H	M	K	N	S
●			○	●	

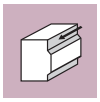
MG Carbide

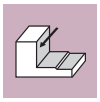
Uncoated Blank

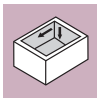


Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		40		35		35		80		50		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E182/E185-3	3	2,300	55	2,100	50	2,100	50	3,700	110	2,650	75	2,300	55
E182/E185-4	4	1,750	55	1,550	50	1,550	50	2,750	110	1,950	75	1,750	55
E182/E185/E187-5	5	1,400	55	1,250	50	1,250	50	2,200	110	1,550	75	1,400	55
E182/E185/E187-6	6	1,150	55	1,050	50	1,050	50	1,850	110	1,300	75	1,150	55
E182-7	7	955	55	865	50	865	50	1,590	110	1,135	75	955	55
E182/E185/E187-8	8	875	55	795	50	795	50	1,350	110	995	75	875	55
E182-9	9	745	55	675	50	675	50	1,235	110	875	75	745	55
E182/E185/E187-10	10	700	55	635	50	635	50	1,100	110	795	75	700	55
E182/E185/E187-12	12	580	55	530	50	530	50	925	110	660	75	580	55
E182/E185/-14	14	475	55	435	50	435	50	795	110	575	75	475	55
E182/E185/E187-16	16	415	55	420	50	420	50	695	110	475	75	415	55
E182/E185/E187-20	20	330	55	305	50	305	50	555	110	385	75	330	55
切入深度 (mm) 		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D	

※ Notice: E185、E187 is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E185、E187爲加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

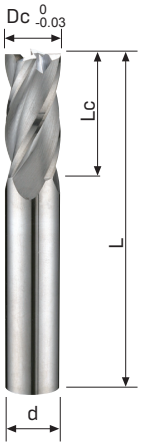
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E174-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E174	TiAlN E174F
1	3	38	3	●	——
1.5	5	38	3	●	——
2	6	38	3	●	——
2.5	7	38	3	●	——
3	9	38	3	●	——
3.5	12	50	4	●	——
4	14	50	4	●	——
4.5	14	50	5	●	——
5	16	50	5	●	——
5.5	16	50	6	●	——
6	20	63	6	●	——
6.5	20	63	8	●	——
7	20	63	8	●	——
7.5	20	63	8	●	——
8	20	63	8	●	——
8.5	22	72	10	●	——
9	22	72	10	●	——
9.5	22	72	10	●	——
10	22	72	10	●	——
11	26	75	12	●	——
12	26	75	12	●	——
13	32	89	14	●	——
14	32	89	14	●	——
15	32	89	16	●	——
16	32	89	16	●	——
17	38	100	18	●	——
18	38	100	18	●	——
20	38	100	20	●	——

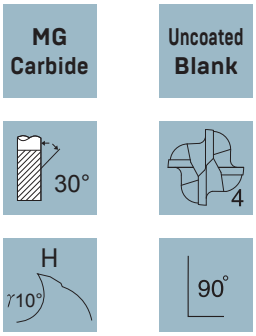
※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨

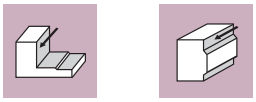


Steel < 30HRC

P	H	M	K	N	S
●			○	●	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

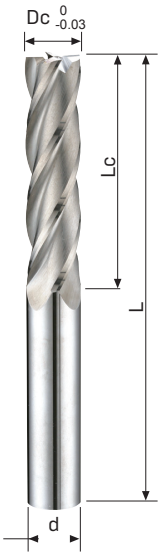
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		60		60		50		150		100		60	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E174-1	1	14,000	140	14,000	140	10,500	120	38,000	400	25,000	140	10,500	120
E174-1.5	1.5	9,850	200	9,850	200	7,000	180	25,000	450	17,000	200	7,000	180
E174-2	2	7,000	250	7,000	250	5,250	230	19,000	835	12,700	250	5,250	230
E174-2.5	2.5	5,600	250	5,600	250	4,200	230	15,000	835	10,100	250	4,200	230
E174-3	3	4,650	295	4,650	295	3,500	230	12,700	900	8,500	295	3,500	230
E174-2.5	3.5	4,050	320	4,050	320	3,060	230	11,100	925	7,400	320	3,060	230
E174-4	4	3,500	350	3,500	350	2,620	230	9,500	950	6,300	350	2,620	230
E174-4.5	4.5	3,150	360	3,150	360	2,350	240	8,500	960	5,700	360	2,350	240
E174-5	5	2,800	370	2,800	370	2,100	250	7,600	970	5,100	370	2,100	250
E174-5.5	5.5	2,550	375	2,550	375	1,920	250	6,900	980	4,650	375	1,920	250
E174-6	6	2,300	385	2,300	385	1,750	250	6,300	990	4,200	385	1,750	250
E174-7	7	2,025	385	2,025	385	1,525	250	5,520	995	3,650	385	1,525	250
E174-8	8	1,750	390	1,750	390	1,300	250	4,775	1,000	3,100	390	1,300	250
E174-9	9	1,570	415	1,570	415	1,175	250	4,270	1,000	2,800	415	1,175	250
E174-10	10	1,400	445	1,400	445	1,050	250	3,800	1,000	2,500	445	1,050	250
E174-11	11	1,280	445	1,280	445	960	250	3,485	1,050	2,300	445	960	250
E174-12	12	1,165	450	1,165	450	875	250	3,185	1,100	2,100	450	875	250
E174-13	13	1,080	485	1,080	485	810	260	2,950	1,100	1,950	485	810	260
E174-14	14	1,000	525	1,000	525	750	275	2,730	1,100	1,800	525	750	275
E174-15	15	935	535	935	535	700	285	2,550	1,100	1,700	535	700	285
E174-16	16	875	545	875	545	650	295	2,400	1,100	1,600	545	650	295
E174-17	17	825	545	825	545	615	295	2,250	1,100	1,500	545	615	295
E174-18	18	775	550	775	550	580	295	2,100	1,100	1,400	550	580	295
E174-20	20	700	560	700	560	525	295	1,900	1,100	1,200	560	525	295
切入深度 (mm) 		ap:1.5		ap:1.5		ap:1.5		ap:1.5		ap:1.5		ap:1.5	
		ae:0.05		ae:0.05		ae:0.05		ae:0.1		ae:0.05		ae:0.05	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

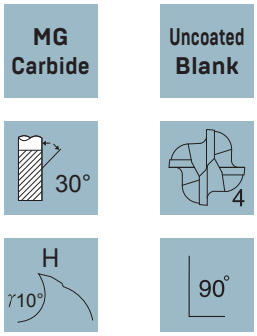
Code No. E184-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E184	TiAlN E184F
3	20	57	3	●	——
4	20	57	4	●	——
5	25	63	5	●	——
6	28	75	6	●	——
7	30	75	8	●	——
8	30	75	8	●	——
9	32	75	10	●	——
10	32	75	10	●	——
12	50	100	12	●	——
14	57	127	14	●	——
16	57	127	16	●	——
20	57	127	20	●	——

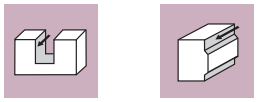


Steel < 30HRC

P	H	M	K	N	S
●			○	●	

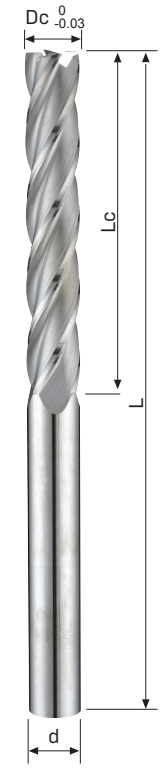


Type of Operation



Code No. E186-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E186	TiAlN E186F
3	25	75	3	●	——
4	28	75	4	●	——
5	32	75	5	●	——
6	38	100	6	●	——
8	42	100	8	●	——
10	45	100	10	●	——
12	75	150	12	●	——
14	80	150	14	●	——
16	80	150	16	●	——
20	80	150	20	●	——



Code No. E188-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E188	TiAlN E188F
5	45	100	6	●	——
6	50	100	6	●	——
8	75	150	8	●	——
10	75	150	10	●	——
12	75	200	12	●	——
16	80	200	16	●	——
20	80	200	20	●	——

※ Mark: ——, On request, no stock
※ 記號 ——，可訂購規格，無現貨

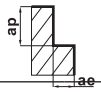
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E184 / E186 / E188 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		30		30		20		45		40		20	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E184/E186-3	3	2,300	80	2,300	80	2,000	70	3,700	175	2,650	80	2,000	70
E184/E186-4	4	1,700	80	1,700	80	1,400	75	2,750	175	1,950	80	1,400	75
E184/E186/E188-5	5	1,400	80	1,400	80	1,100	75	2,230	175	1,590	80	1,100	75
E184/E186/E188-6	6	1,100	80	1,100	80	955	75	1,850	175	1,300	80	955	75
E184-7	7	985	80	985	80	825	75	1,640	175	1,150	80	825	75
E184/E186/E188-8	8	875	80	875	80	700	75	1,390	175	995	80	700	75
E184-9	9	780	80	780	80	630	75	1,250	175	895	80	630	75
E184/E186/E188-10	10	700	80	700	80	570	75	1,110	175	795	80	570	75
E184/E186/E188-12	12	580	80	580	80	470	75	930	175	660	80	470	75
E184/E186-14	14	500	90	500	90	400	80	800	185	570	90	400	80
E184/E186/E188-16	16	435	90	435	90	350	80	700	185	500	90	350	80
E184/E186/E188-20	20	350	90	350	90	280	80	550	185	400	90	280	80
切入深度 (mm) 		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D	

※ Notice: E186、E188 is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E186、E188爲加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B212 超微粒鎢鋼圓頭立銑刀

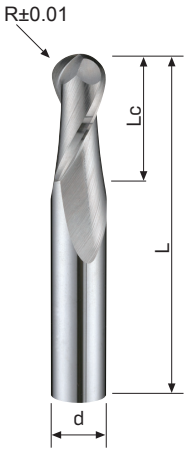
Ball Nose End Mills

Code No. B212-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B212	TiAlN B212F
0.2	0.1R	0.4	38	3	●	——
0.3	0.15R	0.6	38	3	●	——
0.4	0.2R	0.8	38	3	●	——
0.5	0.25R	1	38	3	●	——
0.6	0.3R	1.2	38	3	●	——
0.7	0.35R	1.4	38	3	●	——
0.8	0.4R	1.6	38	3	●	——
0.9	0.45R	2	38	3	●	——
1	0.5R	3	38	3	●	——
1.5	0.75R	5	38	3	●	——
2	1R	6	38	3	●	——
2.5	1.25R	7	38	3	●	——
3	1.5R	9	38	3	●	——
3.5	1.75R	12	50	4	●	——
4	2R	14	50	4	●	——
4.5	2.25R	16	50	5	●	——
5	2.5R	16	50	5	●	——
5.5	2.75R	16	50	6	●	——
6	3R	20	63	6	●	——
6.5	3.25R	20	63	8	●	——
7	3.5R	20	63	8	●	——
7.5	3.75R	20	63	8	●	——
8	4R	20	63	8	●	——
8.5	4.25R	22	72	10	●	——
9	4.5R	22	72	10	●	——
9.5	4.75R	22	72	10	●	——
10	5R	22	72	10	●	——
11	5.5R	26	75	12	●	——
12	6R	26	75	12	●	——
13	6.5R	32	89	14	●	——
14	7R	32	89	14	●	——
15	7.5R	32	89	16	●	——
16	8R	32	89	16	●	——
17	8.5R	38	100	18	●	——
18	9R	38	100	18	●	——
20	10R	38	100	20	●	——

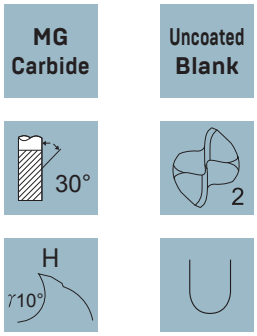
※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨

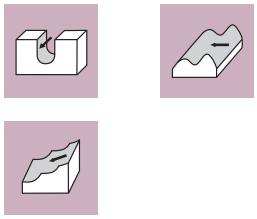


Steel < 30HRC

P	H	M	K	N	S
●			○	●	



Type of Operation



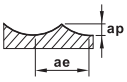
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B212 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

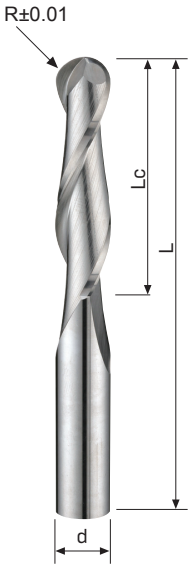
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		40		40		35		100		40		35	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B212-0.2	0.2	25,000	30	25,000	30	22,000	25	32,000	35	25,000	30	22,000	25
B212-0.3	0.3	25,000	50	25,000	50	22,000	40	32,000	70	25,000	50	22,000	40
B212-0.5	0.5	25,000	50	25,000	50	22,000	40	32,000	80	25,000	50	22,000	40
B212-0.8	0.8	25,000	50	25,000	50	22,000	40	32,000	80	25,000	50	22,000	40
B212-1	1	12,500	95	12,500	95	10,500	40	31,500	200	12,500	95	10,500	40
B212-1.5	1.5	9,400	95	9,400	95	7,900	40	23,500	200	9,400	95	7,900	40
B212-2	2	6,350	95	6,350	95	5,400	40	15,500	200	6,350	95	5,400	40
B212-2.5	2.5	5,200	110	5,200	110	4,500	60	13,000	250	5,200	110	4,500	60
B212-3	3	4,200	125	4,200	125	3,600	80	10,500	300	4,200	125	3,600	80
B212-3.5	3.5	3,650	125	3,650	125	3,150	80	9,225	300	3,650	125	3,150	80
B212-4	4	3,150	125	3,150	125	2,700	80	7,950	300	3,150	125	2,700	80
B212-4.5	4.5	2,800	125	2,800	125	2,350	80	7,150	300	2,800	125	2,350	80
B212-5	5	2,500	125	2,500	125	2,150	80	6,350	300	2,500	125	2,150	80
B212-5.5	5.5	2,300	125	2,300	125	1,970	80	5,800	300	2,300	125	1,970	80
B212-6	6	2,100	125	2,100	125	1,800	80	5,300	300	2,100	125	1,800	80
B212-7	7	1,800	125	1,800	125	1,570	80	4,600	300	1,800	125	1,570	80
B212-8	8	1,550	125	1,550	125	1,350	80	3,950	300	1,550	125	1,350	80
B212-9	9	1,400	125	1,400	125	1,150	80	3,550	300	1,400	125	1,150	80
B212-10	10	1,250	125	1,250	125	1,050	80	3,150	300	1,250	125	1,050	80
B212-11	11	1,150	125	1,150	125	950	80	2,850	300	1,150	125	950	80
B212-12	12	1,050	125	1,050	125	900	80	2,650	300	1,050	125	900	80
B212-13	13	950	125	950	125	830	80	2,450	300	950	125	830	80
B212-14	14	900	125	900	125	770	80	2,250	300	900	125	770	80
B212-15	15	850	137	850	137	720	90	2,100	300	850	137	720	90
B212-16	16	800	150	800	150	675	100	1,950	300	800	150	675	100
B212-17	17	750	150	750	150	635	100	1,850	300	750	150	635	100
B212-18	18	705	150	705	150	600	100	1,750	300	705	150	600	100
B212-20	20	635	150	635	150	540	100	1,550	300	635	150	540	100
切入深度 (mm) 		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D		ap:0.1D Dc<Ø1 ae:0.1D Dc≧Ø1 ae:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. B280-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B280	TiAlN B280F
3	1.5R	20	57	3	●	——
4	2R	20	57	4	●	——
5	2.5R	25	63	5	●	——
6	3R	28	75	6	●	——
7	3.5R	30	75	8	●	——
8	4R	30	75	8	●	——
9	4.5R	32	75	10	●	——
10	5R	32	75	10	●	——
12	6R	50	100	12	●	——
14	7R	57	127	14	●	——
16	8R	57	127	16	●	——
20	10R	57	127	20	●	——

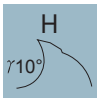


Steel < 48HRC

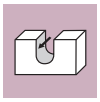
P	H	M	K	N	S
●			○	●	

MG Carbide

Uncoated Blank



Type of Operation



Work Material

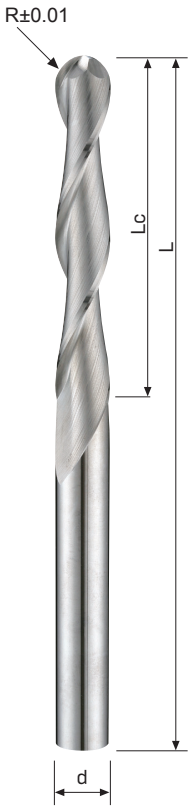
P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. B282-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B282	TiAlN B282F
3	1.5R	25	75	3	●	——
4	2R	28	75	4	●	——
5	2.5R	32	75	5	●	——
6	3R	38	100	6	●	——
8	4R	42	100	8	●	——
10	5R	45	100	10	●	——
12	6R	75	150	12	●	——
14	7R	80	150	14	●	——
16	8R	80	150	16	●	——
20	10R	80	150	20	●	——

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨



B280 / B282 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		40		40		35		80		50		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B280/B282-3	3	2,300	55	2,100	50	2,100	50	3,700	110	2,650	75	2,300	55
B280/B282-4	4	1,750	55	1,550	50	1,550	50	2,750	110	1,950	75	1,750	55
B280/B282-5	5	1,400	55	1,250	50	1,250	50	2,200	110	1,550	75	1,400	55
B280/B282-6	6	1,150	55	1,050	50	1,050	50	1,850	110	1,300	75	1,150	55
B280/B282-7	7	955	55	865	50	865	50	1,590	110	1,135	75	955	55
B280/B282-8	8	875	55	795	50	795	50	1,350	110	995	75	875	55
B280/B282-9	9	745	55	675	50	675	50	1,235	110	875	75	745	55
B280/B282-10	10	700	55	635	50	635	50	1,100	110	795	75	700	55
B280/B282-12	12	580	55	530	50	530	50	925	110	660	75	580	55
B280/B282-14	14	475	55	435	50	435	50	795	110	575	75	475	55
B280/B282-16	16	415	55	420	50	420	50	695	110	475	75	415	55
B280/B282-20	20	330	55	305	50	305	50	555	110	385	75	330	55
切入深度 (mm) 		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D	

※ Notice: B282 is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意B282爲加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B214 超微粒鎢鋼圓頭立銑刀

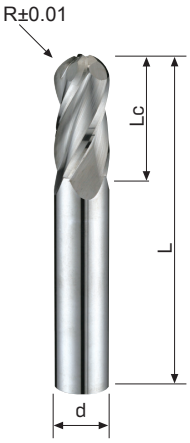
Ball Nose End Mills

Code No. B214-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B214	TiAlN B214F
1	0.5R	3	38	3	●	——
1.5	0.75R	5	38	3	●	——
2	1R	6	38	3	●	——
2.5	1.25R	7	38	3	●	——
3	1.5R	9	38	3	●	——
3.5	1.75R	12	50	4	●	——
4	2R	14	50	4	●	——
4.5	2.25R	16	50	5	●	——
5	2.5R	16	50	5	●	——
5.5	2.75R	16	50	6	●	——
6	3R	20	63	6	●	——
6.5	3.25R	20	63	8	●	——
7	3.5R	20	63	8	●	——
7.5	3.75R	20	63	8	●	——
8	4R	20	63	8	●	——
8.5	4.25R	22	72	10	●	——
9	4.5R	22	72	10	●	——
9.5	4.75R	22	72	10	●	——
10	5R	22	72	10	●	——
11	5.5R	26	75	12	●	——
12	6R	26	75	12	●	——
13	6.5R	32	89	14	●	——
14	7R	32	89	14	●	——
15	7.5R	32	89	16	●	——
16	8R	32	89	16	●	——
17	8.5R	38	100	18	●	——
18	9R	38	100	18	●	——
20	10R	38	100	20	●	——

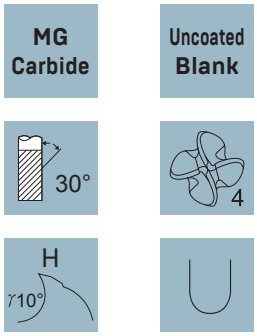
※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨

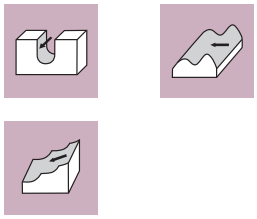


Steel < 30HRC

P	H	M	K	N	S
●			○	●	



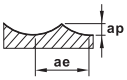
Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

General processing 普通加工

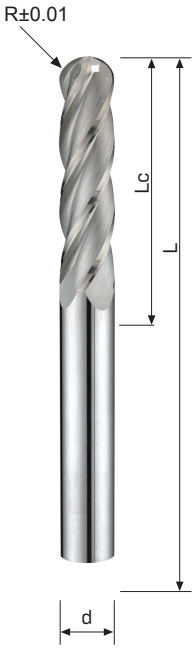
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		60		60		50		150		100		60	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B214-R0.5	1	14,000	140	14,000	140	10,500	120	38,000	400	25,000	140	10,500	120
B214-R0.75	1.5	9,850	200	9,850	200	7,000	180	25,000	450	17,000	200	7,000	180
B214-R1	2	7,000	250	7,000	250	5,250	230	19,000	835	12,700	250	5,250	230
B214-R1.25	2.5	5,600	250	5,600	250	4,200	230	15,000	835	10,100	250	4,200	230
B214-R1.5	3	4,650	295	4,650	295	3,500	230	12,700	900	8,500	295	3,500	230
B214-R1.75	3.5	4,000	295	4,000	295	3,000	230	11,000	900	7,200	295	3,000	230
B214-R2	4	3,500	350	3,500	350	2,620	230	9,500	950	6,300	350	2,620	230
B214-R2.25	4.5	3,100	350	3,100	350	2,335	230	8,500	950	5,600	350	2,335	230
B214-R2.5	5	2,800	370	2,800	370	2,100	250	7,600	970	5,100	370	2,100	250
B214-R2.75	5.5	2,550	375	2,550	375	1,920	250	6,950	980	4,650	375	1,920	250
B214-R3	6	2,300	385	2,300	385	1,750	250	6,300	990	4,200	385	1,750	250
B214-R3.5	7	2,000	385	2,000	385	1,520	250	5,520	990	3,650	385	1,520	250
B214-R4	8	1,750	390	1,750	390	1,300	250	4,775	1,000	3,100	390	1,300	250
B214-R4.5	9	1,570	415	1,570	415	1,175	250	4,280	1,000	2,800	415	1,175	250
B214-R5	10	1,400	445	1,400	445	1,050	250	3,800	1,000	2,500	445	1,050	250
B214-R5.5	11	1,280	445	1,280	445	965	250	3,485	1,050	2,300	445	965	250
B214-R6	12	1,165	450	1,165	450	875	250	3,185	1,100	2,100	450	875	250
B214-R6.5	13	1,080	485	1,080	485	810	260	2,950	1,100	1,950	485	810	260
B214-R7	14	1,000	525	1,000	525	750	275	2,730	1,100	1,800	525	750	275
B214-R7.5	15	935	535	935	535	700	285	2,550	1,100	1,700	535	700	285
B214-R8	16	875	545	875	545	650	295	2,400	1,100	1,600	545	650	295
B214-R8.5	17	825	545	825	545	615	295	2,250	1,100	1,500	545	615	295
B214-R9	18	775	550	775	550	580	295	2,100	1,100	1,400	550	580	295
B214-R10	20	700	560	700	560	525	295	1,900	1,100	1,200	560	525	295
切入深度 (mm) 		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D		ap:0.1D Dc≤Ø1 ae:0.1D Dc>Ø1 ae:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. B281-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B281	TiAlN B281F
3	1.5R	20	57	3	●	——
4	2R	20	57	4	●	——
5	2.5R	25	63	5	●	——
6	3R	28	75	6	●	——
7	3.5R	30	75	8	●	——
8	4R	30	75	8	●	——
9	4.5R	32	75	10	●	——
10	5R	32	75	10	●	——
12	6R	50	100	12	●	——
14	7R	57	127	14	●	——
16	8R	57	127	16	●	——
20	10R	57	127	20	●	——

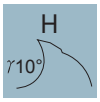


Steel < 30HRC

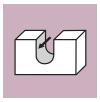
P	H	M	K	N	S
●			○	●	

MG Carbide

Uncoated Blank



Type of Operation



Work Material

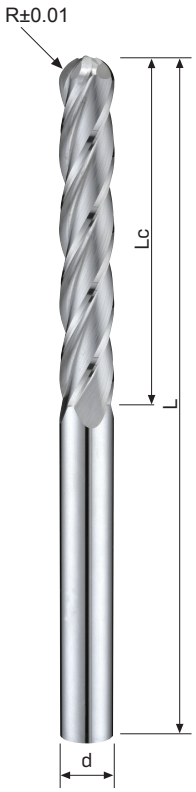
P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. B284-Dc

Dc 0 -0.03	R ±0.01	Lc mm	L mm	d h6	Blank B284	TiAlN B284F
3	1.5R	25	75	3	●	——
4	2R	28	75	4	●	——
5	2.5R	32	75	5	●	——
6	3R	38	100	6	●	——
8	4R	42	100	8	●	——
10	5R	45	100	10	●	——
12	6R	75	150	12	●	——
14	7R	80	150	14	●	——
16	8R	80	150	16	●	——
20	10R	80	150	20	●	——

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨



B281 / B284 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		30		30		20		45		40		20	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
B281/B284-3	3	2,300	80	2,300	80	2,000	70	3,700	175	2,650	80	2,000	70
B281/B284-4	4	1,700	80	1,700	80	1,400	75	2,750	175	1,950	80	1,400	75
B281/B284-5	5	1,400	80	1,400	80	1,100	75	2,230	175	1,590	80	1,100	75
B281/B284-6	6	1,100	80	1,100	80	955	75	1,850	175	1,300	80	955	75
B281-7	7	985	80	985	80	825	75	1,620	175	1,150	80	825	75
B281/B284-8	8	875	80	875	80	700	75	1,390	175	995	80	700	75
B281-9	9	780	80	780	80	630	75	1,250	175	895	80	630	75
B281/B284-10	10	700	80	700	80	570	75	1,110	175	795	80	570	75
B281/B284-12	12	580	80	580	80	470	75	930	175	660	80	470	75
B281/B284-14	14	500	90	500	90	400	80	800	185	570	90	400	80
B281/B284-16	16	435	90	435	90	350	80	700	185	500	90	350	80
B281/B284-20	20	350	90	350	90	280	80	550	185	400	90	280	80
切入深度 (mm) 		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D		ap:4D	
		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D		ae:0.01D	

※ Notice: B284 is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意B284爲加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

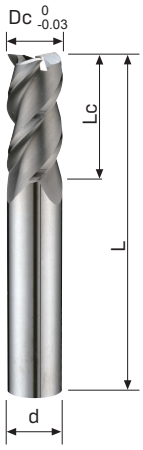
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

E133 超微粒鎢鋼鋁用立銑刀

End Mills For Aluminum

Code No. E133-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E133
1	3	38	3	●
1.5	5	38	3	●
2	6	38	3	●
2.5	7	38	3	●
3	9	38	3	●
4	14	50	4	●
5	16	50	5	●
6	20	63	6	●
7	20	63	8	●
8	20	63	8	●
9	22	72	10	●
10	22	72	10	●
12	26	75	12	●
14	32	89	14	●
16	32	89	16	●
18	38	100	18	●
20	38	100	20	●

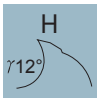


Aluminium

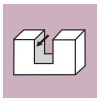
P	H	M	K	N	S
				●	

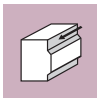
MG Carbide

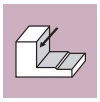
Uncoated Blank

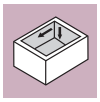


Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	○
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E133 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E133-1	1	30,000	860
E133-1.5	1.5	22,500	600
E133-2	2	22,500	800
E133-2.5	2.5	23,400	1,100
E133-3	3	21,000	950
E133-4	4	15,500	1,000
E133-5	5	12,500	1,100
E133-6	6	10,500	1,200
E133-7	7	9,250	1,250
E133-8	8	8,000	1,300
E133-9	9	7,150	1,400
E133-10	10	6,350	1,500
E133-12	12	5,300	1,550
E133-14	14	4,600	1,550
E133-16	16	4,000	1,550
E133-18	18	3,570	1,500
E133-20	20	3,150	1,500
切入深度 (mm) 		ap:1.5D ae:0.1D	

Slotting 溝切削

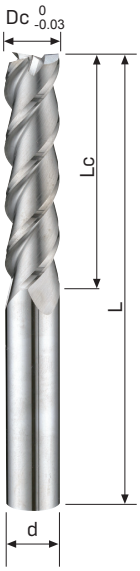
被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E133-1	1	30,000	400
E133-1.5	1.5	22,500	500
E133-2	2	22,500	800
E133-2.5	2.5	23,400	900
E133-3	3	21,000	670
E133-4	4	15,500	700
E133-5	5	12,500	745
E133-6	6	10,500	820
E133-7	7	9,250	840
E133-8	8	8,000	860
E133-9	9	7,150	910
E133-10	10	6,350	960
E133-12	12	5,300	1,050
E133-14	14	4,600	1,050
E133-16	16	4,000	1,050
E133-18	18	3,570	1,050
E133-20	20	3,150	1,050
切入深度 (mm) 		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

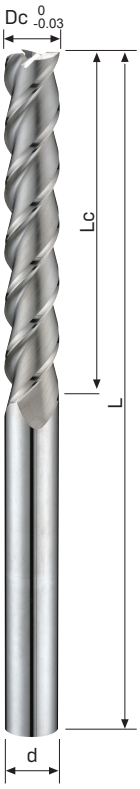
Code No. E135-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E135
3	20	57	3	●
4	20	57	4	●
5	25	63	5	●
6	28	75	6	●
7	30	75	8	●
8	30	75	8	●
9	32	75	10	●
10	32	75	10	●
12	50	100	12	●
14	57	127	14	●
16	57	127	16	●
20	57	127	20	●



Code No. E136-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E136
3	25	75	3	●
4	28	75	4	●
5	32	75	5	●
6	38	100	6	●
8	42	100	8	●
10	45	100	10	●
12	75	150	12	●
14	80	150	14	●
16	80	150	16	●
20	80	150	20	●



Code No. E137-Dc

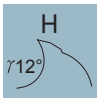
Dc 0 -0.03	Lc mm	L mm	d h6	Blank E137
5	45	100	6	●
6	50	100	6	●
8	75	150	8	●
10	75	150	10	●
12	75	200	12	●
16	80	200	16	●
20	80	200	20	●

Aluminium

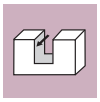
P	H	M	K	N	S
				●	

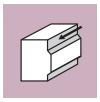
MG Carbide

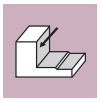
Uncoated Blank

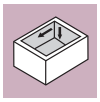


Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	○
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E135/E136-3	3	10,500	475
E135/E136-4	4	7,750	500
E135/E136/E137-5	5	6,250	550
E135/E136/E137-6	6	5,250	600
E135-7	7	4,600	625
E135/E136/E137-8	8	4,000	650
E135-9	9	3,580	700
E135/E136/E137-10	10	3,175	750
E135/E136/E137-12	12	2,650	775
E135/E136-14	14	2,325	775
E135/E136/E137-16	16	2,000	775
E135/E136/E137-20	20	1,575	750
切入深度 （mm） 		ap:3.0D ae:0.05D	

※ Notice: E136、E137 is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意E136、E137為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

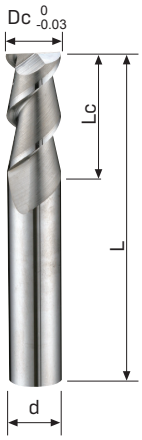
E192 超微粒鎢鋼粗加工鋁用立銑刀

Roughing End Mills For Aluminium

MG Carbide | Uncoated Blank | 55° | 2 | W γ15° | 90°

Code No. E192-Dc

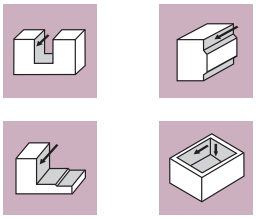
Dc 0 -0.03	Lc mm	L mm	d h6	Blank E192
3	9	38	3	●
4	14	50	4	●
5	16	50	5	●
6	20	63	6	●
8	22	63	8	●
10	30	72	10	●
12	30	75	12	●
16	40	100	16	●
20	45	100	20	●



Aluminium

P	H	M	K	N	S
				●	

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

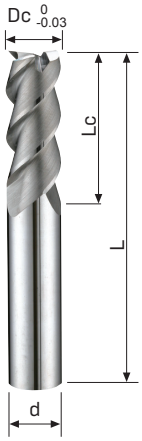
E193 超微粒鎢鋼精加工鋁用立銑刀

Finishing End Mills For Aluminium

MG Carbide | Uncoated Blank | 50° | 3 | W γ15° | 90°

Code No. E193-Dc

Dc 0 -0.03	Lc mm	L mm	d h6	Blank E193
3	9	50	6	●
4	14	50	6	●
5	16	50	6	●
6	20	63	6	●
8	22	63	8	●
10	30	72	10	●
12	30	75	12	●
16	40	100	16	●
20	45	100	20	●



E192 / E193 切削條件參考表

Recommended Milling Conditions

E192 / Slotting 溝切削

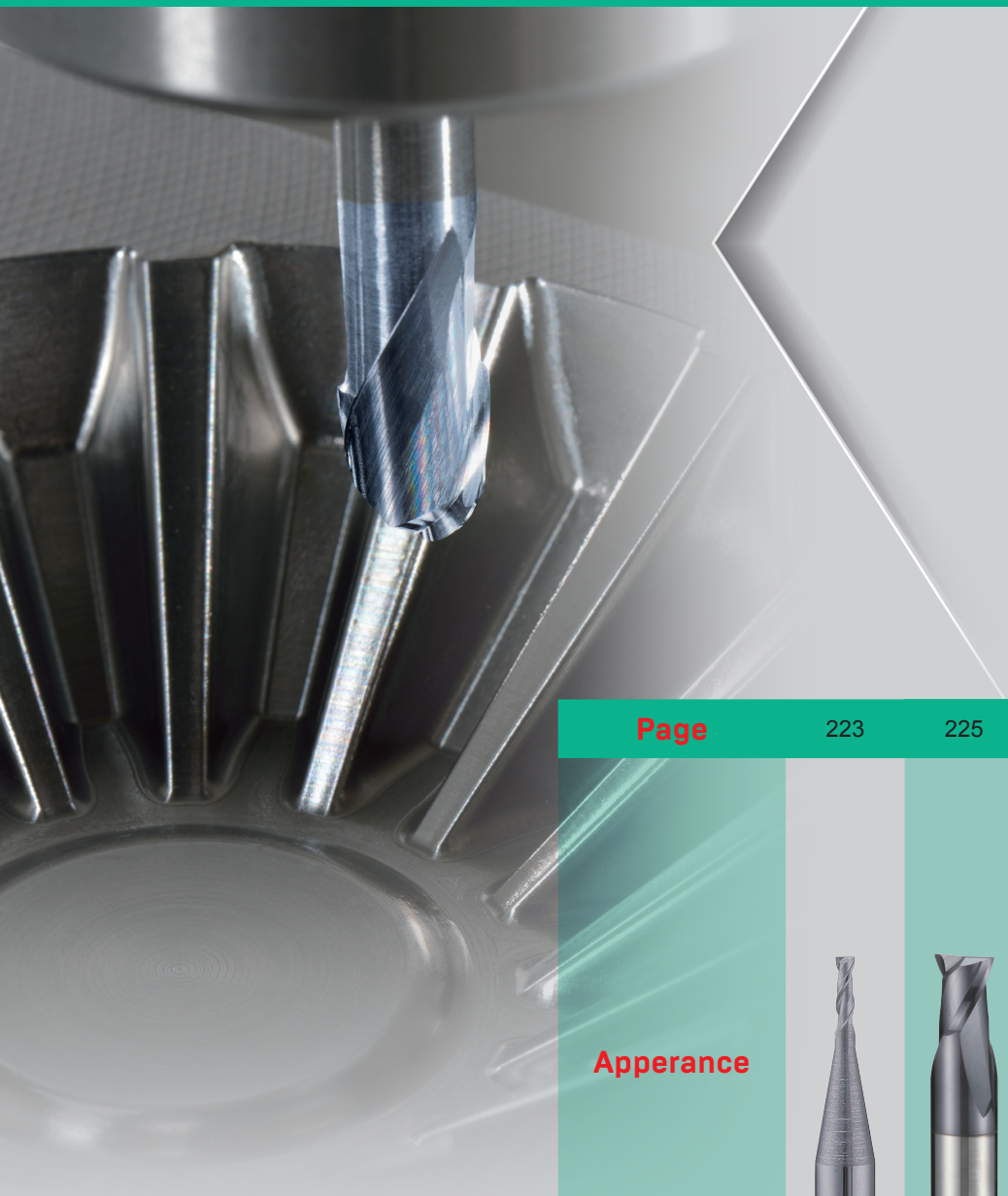
被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E192-3	3	21,000	470
E192-4	4	15,500	490
E192-5	5	12,500	520
E192-6	6	10,500	570
E192-8	8	8,000	600
E192-10	10	6,350	670
E192-12	12	5,300	735
E192-16	16	4,000	735
E192-20	20	3,150	735
切入深度 （mm） 		ap:0.5D	

E193 / Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		200	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E193-3	3	21,000	950
E193-4	4	15,500	1,000
E193-5	5	12,500	1,100
E193-6	6	10,500	1,200
E193-8	8	8,000	1,300
E193-10	10	6,350	1,500
E193-12	12	5,300	1,550
E193-16	16	4,000	1,550
E193-20	20	3,150	1,500
切入深度 （mm） 		ap:1.5D ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



立銑刀
End Mills

Page	223	225	227	229	231	233
Apperance						
Code No	E102HX	F500HX F501HX	F602TX	F503HX F504HX	F603TX	E104HX
Carbide	MG Carbide	MG Carbide	UMG Carbide	MG Carbide	UMG Carbide	MG Carbide
Coating	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX	AlTiCrN HX	AlTiSiN TX	AlTiCrN HX
Helix Angle	30°	30°	35°	30°	35°	30°
No.of Flutes	2	2	2	3	3	4

歐規
DIN

7leaders®
The Art of Cutting

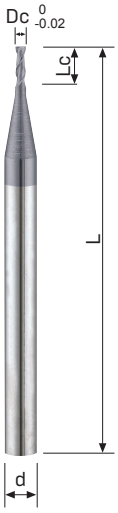
235	237	239	241	243	245	247
						
F506HX F507HX	F604TX F606TX	F660TX F661TX	B202HX	F520HX F521HX	F623HX F624HX	F625TX F626TX
MG Carbide	UMG Carbide	SMG Carbide	MG Carbide	MG Carbide	MG Carbide	SMG Carbide
AlTiCrN HX	AlTiSiN TX	AlTiSiN TX	AlTiCrN HX	AlTiCrN HX	AlTiCrN HX	AlTiSiN TX
30°	35°	55°	30°	30°	30°	30°
4	4	Z	2	2	2	2

E102HX 超微粒鎢鋼塗層通用立銑刀

Universal End Mills

Code No. E102HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN E102HX
0.2	0.5	38	3	●
0.3	0.8	38	3	●
0.4	1	38	3	●
0.5	1.2	38	3	●
0.6	1.5	38	3	●
0.7	1.8	38	3	●
0.8	2	38	3	●
0.9	2.5	38	3	●
1	3	38	3	●
1.1	3	38	3	●
1.2	4	38	3	●
1.3	4	38	3	●
1.4	4	38	3	●
1.5	5	38	3	●
1.6	5	38	3	●
1.7	5	38	3	●
1.8	5	38	3	●
1.9	5	38	3	●
2	6	38	3	●
2.1	6	38	3	●
2.2	6	38	3	●
2.3	6	38	3	●
2.4	8	38	3	●
2.5	8	38	3	●
2.6	8	38	3	●
2.7	8	38	3	●
2.8	8	38	3	●
2.9	8	38	3	●
3	8	38	3	●

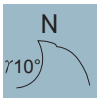


Steel < 48HRC

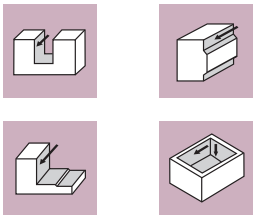
P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiCrN HX



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E102HX 切削條件參考表

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		Ø0.2~0.7 20~50 Ø0.8~3.0 55~65		Ø0.2~0.7 20~50 Ø0.8~3.0 55~65		Ø0.2~0.7 20~50 Ø0.8~3.0 55~65		Ø0.2~0.7 20~38 Ø0.8~3.0 40~50		Ø0.2~0.7 20~34 Ø0.8~3.0 35~45		Ø0.2~0.7 20~38 Ø0.8~3.0 40~50		Ø0.2~0.7 20~50 Ø0.8~3.0 55~65		Ø0.2~0.7 30~95 Ø0.8~3.0 125~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E102HX-0.2	0.2	32,000	85	32,000	85	32,000	80	32,000	75	32,000	30	32,000	75	32,000	85	50,000	140
E102HX-0.3	0.3	32,000	100	32,000	100	32,000	90	32,000	80	32,000	55	32,000	80	32,000	100	50,000	170
E102HX-0.4	0.4	32,000	110	32,000	110	32,000	100	32,000	90	27,500	60	32,000	90	32,000	110	50,000	190
E102HX-0.5	0.5	31,000	115	31,000	115	31,000	105	25,000	90	22,000	60	25,000	90	31,000	115	50,000	200
E102HX-0.6	0.6	27,000	118	27,000	118	27,000	105	19,500	90	17,000	60	19,500	90	27,000	118	50,000	230
E102HX-0.8	0.8	21,500	120	21,500	120	21,500	110	15,500	90	13,500	60	15,500	90	21,500	120	50,000	290
E102HX-1	1	17,500	120	17,500	120	17,500	110	12,500	90	11,000	60	12,500	90	17,500	120	47,500	300
E102HX-1.2	1.2	15,000	118	15,000	118	15,000	105	10,500	90	9,300	60	10,500	90	15,000	118	40,500	300
E102HX-1.5	1.5	12,500	122	12,500	122	12,500	110	8,900	90	7,900	60	8,900	90	12,500	122	32,000	300
E102HX-1.8	1.8	10,500	125	10,500	125	10,500	115	7,500	90	6,800	60	7,500	90	10,500	125	28,000	300
E102HX-2	2	9,700	130	9,700	130	9,700	120	7,000	90	6,300	70	7,000	90	9,700	130	24,000	300
E102HX-2.5	2.5	8,200	155	8,200	155	8,200	140	6,100	90	5,300	70	6,100	90	8,200	155	20,000	350
E102HX-3	3	6,900	170	6,900	170	6,900	155	5,300	100	4,400	70	5,300	100	6,900	170	16,000	400
切入深度 (mm)		ap:<1 0.1D <3 0.3D ≥3 0.5D				ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.01D <3 0.02D ≥3 0.05D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D		ap:<1 0.1D <3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F500HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F500HX
2	3	50	6	●
3	4	50	6	●
4	5	54	6	●
5	6	54	6	●
6	7	54	6	●
8	9	58	8	●
10	11	66	10	●
12	12	73	12	●
14	14	75	14	●
16	16	82	16	●
18	18	84	18	●
20	20	92	20	●

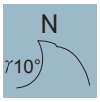
DIN 6535 HB

Steel < 48HRC

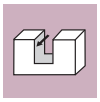
P	H	M	K	N	S
●	●	○	●	○	

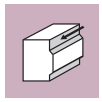
MG Carbide

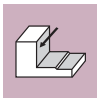
AlTiCrN HX

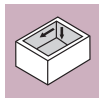


Type of Operation



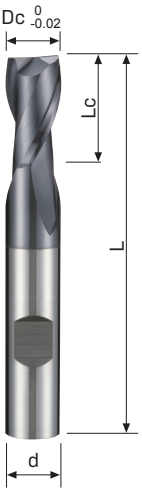






Code No. F501HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F501HX
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●
14	22	83	14	●
16	26	92	16	●
18	26	92	18	●
20	32	104	20	●



DIN 6535 HB

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F500HX / F501HX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel ※切削液使用		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		65~80		65~80		65~80		53~60		44~50		53~60		65~80		125~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F500HX/F501HX-2	2	9,700	130	9,700	130	9,700	117	7,000	90	6,300	70	7,000	90	9,700	130	24,000	300
F500HX/F501HX-3	3	6,900	170	6,900	170	6,900	153	5,300	100	4,400	70	5,300	100	6,900	170	16,000	400
F500HX/F501HX-4	4	5,400	210	5,400	210	5,400	190	4,200	120	3,500	90	4,200	120	5,400	210	12,000	430
F500HX/F501HX-5	5	4,500	265	4,500	265	4,500	240	3,500	130	3,000	95	3,500	130	4,500	265	9,500	500
F500HX/F501HX-6	6	4,000	270	4,000	270	4,000	243	2,900	130	2,500	100	2,900	130	4,000	270	7,900	520
F500HX/F501HX-8	8	3,000	265	3,000	265	3,000	240	2,200	120	1,900	100	2,200	120	3,000	265	5,900	520
F500HX/F501HX-10	10	2,400	255	2,400	255	2,400	230	1,700	120	1,400	95	1,700	120	2,400	255	4,700	500
F500HX/F501HX-12	12	2,000	246	2,000	246	2,000	220	1,400	120	1,200	95	1,400	120	2,000	246	4,000	500
F500HX/F501HX-14	14	1,700	240	1,700	240	1,700	215	1,200	90	1,000	80	1,200	90	1,700	240	3,500	400
F500HX/F501HX-16	16	1,500	200	1,500	200	1,500	180	1,100	90	800	80	1,100	90	1,500	200	3,000	400
F500HX/F501HX-18	18	1,300	180	1,300	180	1,300	165	900	90	700	70	900	90	1,300	180	2,700	350
F500HX/F501HX-20	20	1,200	155	1,200	155	1,200	140	800	90	600	60	800	90	1,200	155	2,400	300
切入深度 (mm) 		ap:<3 0.3D ≥3 0.5D				ap:<3 0.3D ≥3 0.5D		ap: <3 0.3D ≥3 0.5D		ap:<3 0.02D ≥3 0.05D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

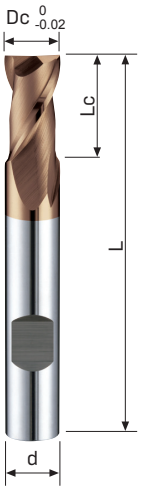
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F602TX 極超微粒鎢鋼塗層通用立銑刀

Universal End Mills

Code No. F602TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiSiN F602TX
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●
16	26	92	16	●
20	32	104	20	●



DIN 6535 HB

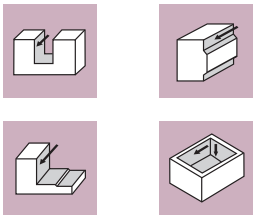
Steel < 62HRC

P	H	M	K	N	S
●	●				

UMG Carbide

AlTiSiN TX

Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F602TX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

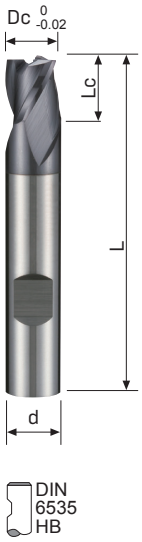
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		80		80		80		55		50		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F602TX-3	3	7,500	190	7,500	190	6,350	150	5,300	100	4,350	75	2,700	40
F602TX-4	4	6,000	225	6,000	225	4,900	180	4,200	120	3,500	90	2,200	50
F602TX-5	5	5,200	300	5,200	300	4,300	230	3,500	125	3,000	100	1,900	55
F602TX-6	6	4,500	300	4,500	300	3,600	230	2,900	120	2,500	100	1,600	55
F602TX-8	8	3,300	280	3,300	280	2,700	230	2,200	120	1,900	100	1,100	50
F602TX-10	10	2,600	270	2,600	270	2,100	220	1,700	120	1,500	90	950	50
F602TX-12	12	2,200	270	2,200	270	1,800	210	1,450	125	1,200	95	800	45
F602TX-16	16	1,600	250	1,600	250	1,350	190	1,100	100	950	85	600	35
F602TX-20	20	1,300	200	1,300	200	1,050	150	880	75	750	65	480	30
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap：0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F503HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F503HX
2	3	50	6	●
3	4	50	6	●
4	5	54	6	●
5	6	54	6	●
6	7	54	6	●
8	9	58	8	●
10	11	66	10	●
12	12	73	12	●
14	14	75	14	●
16	16	82	16	●
18	18	84	18	●
20	20	92	20	●

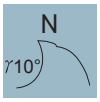


Steel < 48HRC

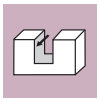
P	H	M	K	N	S
●	●	○	●	○	

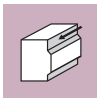
MG Carbide

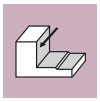
AlTiCrN HX

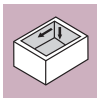


Type of Operation







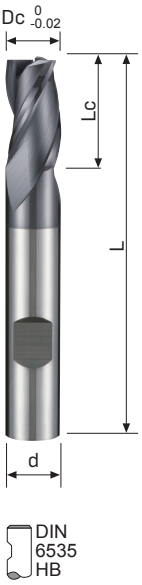


Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. F504HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F504HX
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●
14	22	83	14	●
16	26	92	16	●
18	26	92	18	●
20	32	104	20	●



F503HX / F504HX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel ※切削液使用		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		65~80		65~80		65~80		53~60		44~50		53~60		65~80		125~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F503HX-2	2	9,700	220	9,700	286	9,700	152	7,000	117	6,300	91	7,000	117	9,700	169	24,000	390
F503HX/F504HX-3	3	6,900	287	6,900	373	6,900	199	5,300	130	4,400	91	5,300	130	6,900	221	16,000	520
F503HX/F504HX-4	4	5,400	355	5,400	461	5,400	247	4,200	156	3,500	117	4,200	156	5,400	273	12,000	559
F503HX/F504HX-5	5	4,500	448	4,500	582	4,500	312	3,500	169	3,000	124	3,500	169	4,500	345	9,500	650
F503HX/F504HX-6	6	4,000	456	4,000	593	4,000	316	2,900	169	2,500	130	2,900	169	4,000	351	7,900	676
F503HX/F504HX-8	8	3,000	448	3,000	582	3,000	312	2,200	156	1,900	130	2,200	156	3,000	345	5,900	676
F503HX/F504HX-10	10	2,400	431	2,400	560	2,400	298	1,700	156	1,400	124	1,700	156	2,400	332	4,700	650
F503HX/F504HX-12	12	2,000	416	2,000	540	2,000	286	1,400	156	1,200	124	1,400	156	2,000	320	4,000	650
F503HX/F504HX-14	14	1,700	406	1,700	527	1,700	280	1,200	117	1,000	104	1,200	117	1,700	312	3,500	520
F503HX/F504HX-16	16	1,500	338	1,500	439	1,500	234	1,100	117	800	104	1,100	117	1,500	260	3,000	520
F503HX/F504HX-18	18	1,300	304	1,300	395	1,300	215	900	117	700	91	900	117	1,300	234	2,700	455
F503HX/F504HX-20	20	1,200	202	1,200	262	1,200	181	800	117	600	78	800	117	1,200	202	2,400	390
切入深度 (mm) 		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.02D ≥3 0.05D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D		ap:<3 0.3D ≥3 0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

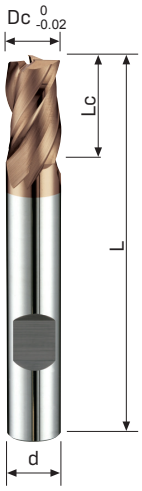
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F603TX 極超微粒鎢鋼塗層通用立銑刀

Universal End Mills

Code No. F603TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiSiN F603TX
3	7	57	6	●
4	8	57	6	●
5	10	57	6	●
6	10	57	6	●
8	16	63	8	●
10	19	72	10	●
12	22	83	12	●
16	26	92	16	●
20	32	104	20	●



DIN 6535 HB

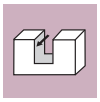
Steel < 62HRC

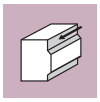
P	H	M	K	N	S
●	●				

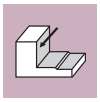
UMG Carbide

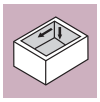
AlTiSiN TX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F603TX 切削條件參考表

Recommended Milling Conditions

Slotting 溝切削

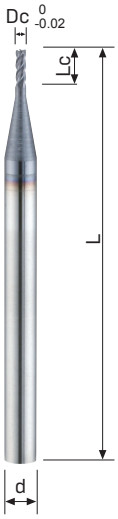
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		80		80		80		55		50		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]
F603TX-3	3	7,500	247	7,500	247	6,350	195	5,300	130	4,350	98	2,700	52
F603TX-4	4	6,000	293	6,000	293	4,900	234	4,200	156	3,500	117	2,200	65
F603TX-5	5	5,200	390	5,200	390	4,300	299	3,500	163	3,000	130	1,900	72
F603TX-6	6	4,500	390	4,500	390	3,600	299	2,900	156	2,500	130	1,600	72
F603TX-8	8	3,300	364	3,300	364	2,700	299	2,200	156	1,900	130	1,100	65
F603TX-10	10	2,600	351	2,600	351	2,100	286	1,700	156	1,500	117	950	65
F603TX-12	12	2,200	351	2,200	351	1,800	273	1,450	163	1,200	124	800	59
F603TX-16	16	1,600	325	1,600	325	1,350	247	1,100	130	950	111	600	46
F603TX-20	20	1,300	260	1,300	260	1,050	195	880	98	750	85	480	39
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap：0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. E104HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN E104HX
1	3	38	3	●
1.1	3	38	3	●
1.2	4	38	3	●
1.3	4	38	3	●
1.4	4	38	3	●
1.5	5	38	3	●
1.6	5	38	3	●
1.7	5	38	3	●
1.8	5	38	3	●
1.9	5	38	3	●
2	6	38	3	●
2.1	6	38	3	●
2.2	6	38	3	●
2.3	6	38	3	●
2.4	8	38	3	●
2.5	8	38	3	●
2.6	8	38	3	●
2.7	8	38	3	●
2.8	8	38	3	●
2.9	8	38	3	●
3	8	38	3	●

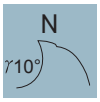


Steel < 48HRC

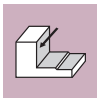
P	H	M	K	N	S
●	●	○	●	○	

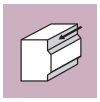
MG Carbide

AlTiCrN HX



Type of Operation





Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

E104HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

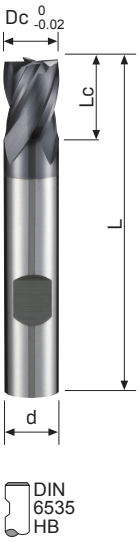
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (24~30HRC)		GR.3 高合金鋼 Hi-alloyed Steel (30HRC~38HRC)		GR.4 硬化鋼 Hardened Steel (35~45HRC)		GR.5 硬化鋼 Hardened Steel (45~50HRC)		GR.8 不鏽鋼 Stainless Steel ※切削液使用		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		85		85		75		60		50		60		85		150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
E104HX-1	1	20,000	240	20,000	240	15,000	210	11,000	85	7,100	40	11,000	85	20,000	240	47,600	420
E104HX-1.5	1.5	13,500	250	13,500	250	12,500	215	8,000	90	6,900	80	8,000	90	13,500	250	31,800	620
E104HX-2	2	13,000	300	13,000	300	11,000	280	7,000	110	6,350	100	7,000	110	13,000	300	24,000	590
E104HX-2.5	2.5	11,000	370	11,000	370	9,500	245	6,300	110	5,500	105	6,300	110	11,000	370	19,200	960
E104HX-3	3	9,000	480	9,000	480	7,400	350	5,300	120	4,800	110	5,300	120	9,000	480	15,800	860
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.01D ≥3 0.02D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F506HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F506HX
2	4	50	6	●
3	5	50	6	●
4	8	54	6	●
5	9	54	6	●
6	10	54	6	●
8	12	58	8	●
10	14	66	10	●
12	16	73	12	●
14	18	75	14	●
16	22	82	16	●
18	24	84	18	●
20	26	92	20	●

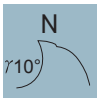


Steel < 48HRC

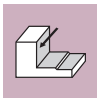
P	H	M	K	N	S
●	●	○	●	○	

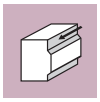
MG Carbide

AlTiCrN HX



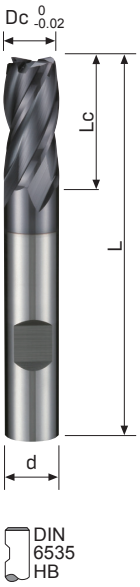
Type of Operation





Code No. F507HX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiCrN F507HX
3	8	57	6	●
4	11	57	6	●
5	13	57	6	●
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
14	26	83	14	●
16	32	92	16	●
18	32	92	18	●
20	38	104	20	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
H	GR5	硬化鋼 38~48HRC Hardened Steel	●
H	GR6	硬化鋼 48~56HRC Hardened Steel	
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
N	GR11	銅 Copper	○
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
S	GR16	鎳 Nickel	
S	GR17	耐熱鋼 Heat-resistant Steel	

F506HX / F507HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

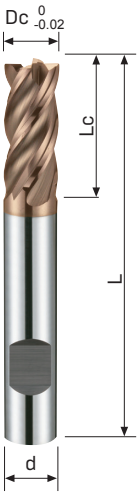
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		85		85		75		60		50		60		85		150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F506HX-2	2	13,000	300	13,000	300	11,000	280	7,000	110	6,350	100	7,000	110	13,000	300	24,000	590
F506HX/F507HX-3	3	9,000	480	9,000	480	7,400	350	5,300	120	4,800	110	5,300	120	9,000	480	15,800	860
F506HX/F507HX-4	4	6,650	500	6,650	500	5,500	350	4,250	135	3,700	115	4,250	135	6,650	500	12,000	900
F506HX/F507HX-5	5	5,300	600	5,300	600	4,500	420	3,500	130	3,200	120	3,500	130	5,300	600	9,400	1,040
F506HX/F507HX-6	6	4,500	600	4,500	600	3,700	425	3,000	140	2,650	125	3,000	140	4,500	600	7,800	1,040
F506HX/F507HX-8	8	3,300	550	3,300	550	2,600	410	1,850	120	1,900	125	1,850	120	3,300	550	5,800	1,010
F506HX/F507HX-10	10	2,600	520	2,600	520	2,100	400	1,500	125	1,500	130	1,500	125	2,600	520	4,800	1,010
F506HX/F507HX-12	12	2,200	520	2,200	520	1,800	405	1,200	120	1,200	120	1,200	120	2,200	520	4,000	1,010
F506HX/F507HX-14	14	1,900	550	1,900	550	1,600	410	1,200	140	1,100	120	1,200	140	1,900	550	3,400	990
F506HX/F507HX-16	16	1,700	530	1,700	530	1,400	410	1,100	130	1,000	100	1,100	130	1,700	530	3,000	960
F506HX/F507HX-18	18	1,500	520	1,500	520	1,200	405	950	100	880	95	950	100	1,500	520	2,600	940
F506HX/F507HX-20	20	1,300	500	1,300	500	1,100	370	900	90	800	90	900	90	1,300	500	2,400	890
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.01D ≥3 0.02D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D		ae:<3 0.05D ≥3 0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F604TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiSiN F604TX
3	8	57	6	●
4	11	57	6	●
5	13	57	6	●
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
16	32	92	16	●
20	38	104	20	●



DIN 6535 HB

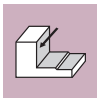
Steel < 62HRC

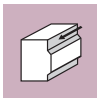
P	H	M	K	N	S
●	●				

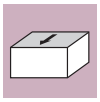
UMG Carbide

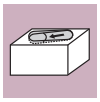
AlTiSiN TX

Type of Operation







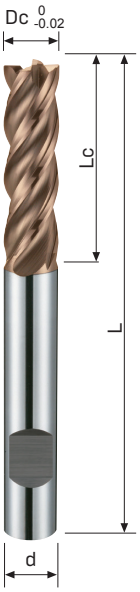


Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Code No. F606TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	AlTiSiN F606TX
3	12	63	6	●
4	17	63	6	●
5	19	63	6	●
6	19	63	6	●
8	28	72	8	●
10	34	84	10	●
12	40	97	12	●
16	48	108	16	●
20	56	122	20	●



DIN 6535 HB

F604TX / F606TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		120		120		80		65		60		45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F604TX/F606TX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	4,800	220
F604TX/F606TX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,600	250
F604TX/F606TX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,900	280
F604TX/F606TX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,400	300
F604TX/F606TX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,800	310
F604TX/F606TX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,400	300
F604TX/F606TX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,200	300
F604TX/F606TX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	900	230
F604TX/F606TX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	720	210
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.02D	

Slotting 溝切削

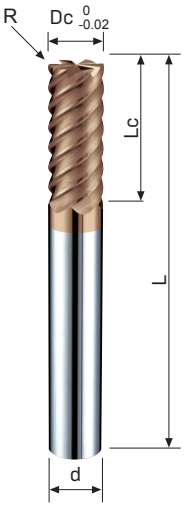
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)	
切削速度 Vc m/min		120		120		80		65		60		45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F604TX/F606TX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	4,800	88
F604TX/F606TX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,600	100
F604TX/F606TX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,900	112
F604TX/F606TX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,400	120
F604TX/F606TX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,800	124
F604TX/F606TX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,400	120
F604TX/F606TX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,200	120
F604TX/F606TX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	900	92
F604TX/F606TX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	720	84
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F660TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	Z	AlTiSiN F660TX
6	13	57	6	6	●
8	19	63	8	6	●
10	22	72	10	6	●
12	26	83	12	6	●
16	32	92	16	8	●
20	38	104	20	10	●

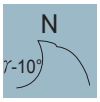


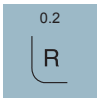
Hardened Steel 40-70HRC

P	H	M	K	N	S
	●		○		

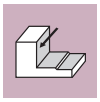
SMG Carbide

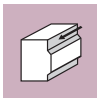
AlTiSiN TX





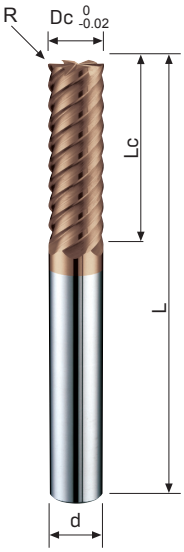
Type of Operation





Code No. F661TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	Z	AlTiSiN F661TX
6	19	63	6	6	●
8	28	72	8	6	●
10	34	84	10	6	●
12	40	97	12	6	●
16	48	108	16	8	●
20	56	122	20	10	●



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F660TX / F661TX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		150		100		90		145	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F660TX/F661TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000	7,400	2,600
F660TX/F661TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000	5,500	2,600
F660TX/F661TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000	4,500	2,600
F660TX/F661TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000	3,700	2,600
F660TX/F661TX-16	16	2,500	2,100	2,000	1,700	1,500	900	2,800	2,400
F660GX/F661TX-20	20	2,000	1,900	1,600	1,400	1,200	830	2,300	2,100
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.6D	
		ae:0.1D		ae:0.05D		ae:0.03D		ae:0.1D	

※ Notice: F661TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意F661TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

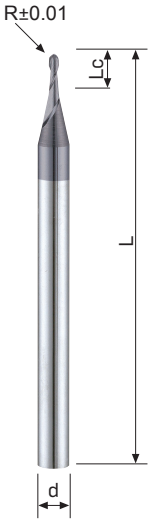
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

B202HX 超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

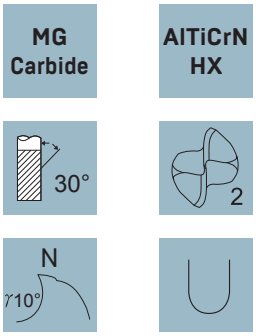
Code No. B202HX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	AlTiCrN B202HX
0.2	0.1R	0.4	38	3	●
0.3	0.15R	0.6	38	3	●
0.4	0.2R	0.8	38	3	●
0.5	0.25R	1	38	3	●
0.6	0.3R	1.2	38	3	●
0.7	0.35R	1.4	38	3	●
0.8	0.4R	1.6	38	3	●
0.9	0.45R	1.8	38	3	●
1	0.5R	2	38	3	●
1.1	0.55R	2.2	38	3	●
1.2	0.6R	2.4	38	3	●
1.4	0.7R	2.8	38	3	●
1.5	0.75R	3	38	3	●
1.6	0.8R	3.2	38	3	●
1.8	0.9R	3.6	38	3	●
2	1R	4	38	3	●
2.5	1.25R	5	38	3	●
3	1.5R	6	38	3	●

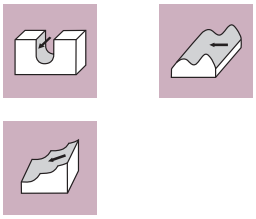


Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	



Type of Operation



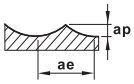
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

B202HX 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		Ø0.2~0.6 20~60 Ø0.8~3.0 80~120		Ø0.2~0.6 20~60 Ø0.8~3.0 80~120		Ø0.2~0.6 20~60 Ø0.8~3.0 80~100		Ø0.2~0.6 20~60 Ø0.8~3.0 60~80		Ø0.2~0.6 20~60 Ø0.8~3.0 60~70		Ø0.2~0.6 20~60 Ø0.8~3.0 60~80		Ø0.2~0.6 20~60 Ø0.8~3.0 80~120		Ø0.2~0.6 25~75 Ø0.8~3.0 100~120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-l)	Feed 進給速度 (mm/min)
B202HX-R0.1	0.2	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	40,000	300
B202HX-R0.15	0.3	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	32,000	200	40,000	300
B202HX-R0.2	0.4	32,000	410	32,000	410	32,000	330	32,000	330	32,000	205	32,000	330	32,000	410	40,000	490
B202HX-R0.25	0.5	32,000	410	32,000	410	32,000	330	32,000	330	32,000	205	32,000	330	32,000	410	40,000	490
B202HX-R0.3	0.6	32,000	490	32,000	490	32,000	400	32,000	400	32,000	265	32,000	400	32,000	490	40,000	580
B202HX-R0.4	0.8	32,000	550	32,000	550	31,500	400	31,500	400	27,500	290	31,500	400	32,000	550	40,000	660
B202HX-R0.5	1	31,500	600	31,500	600	25,000	400	25,000	400	22,000	285	25,000	400	31,500	600	32,000	700
B202HX-R0.6	1.2	31,500	600	31,500	600	25,000	400	25,000	400	22,000	285	25,000	400	31,500	600	32,000	700
B202HX-R0.75	1.5	20,800	600	20,800	600	17,000	400	17,000	400	14,800	285	17,000	400	20,800	600	25,500	700
B202HX-R0.9	1.8	20,800	600	20,800	600	17,000	400	17,000	400	14,800	285	17,000	400	20,800	600	25,500	700
B202HX-R1	2	15,500	600	15,500	600	12,500	400	12,500	400	11,000	290	12,500	400	15,500	600	19,000	700
B202HX-R1.25	2.5	15,500	600	15,500	600	10,200	400	10,200	400	8,900	290	10,200	400	15,500	600	12,700	700
B202HX-R1.5	3	10,500	620	10,500	620	8,450	405	8,450	405	7,400	290	8,450	405	10,500	620	12,500	760
切入深度 (mm) 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D	
		ae:<1 0.1D ≥1 0.2D		ae:<1 0.1D ≥1 0.2D		ae:<1 0.1D ≥1 0.2D		ae:<1 0.1D ≥1 0.2D		ae:<1 0.05D ≥1 0.1D		ae:<1 0.05D ≥1 0.1D		ae:<1 0.1D ≥1 0.2D		ae:<1 0.1D ≥1 0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

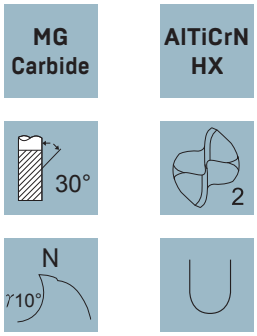
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F520HX-Dc

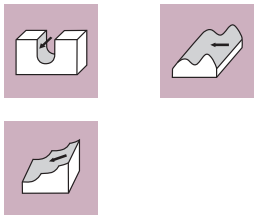
Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	AlTiCrN F520HX
2	R1	3	50	6	●
3	R1.5	4	50	6	●
4	R2	5	54	6	●
5	R2.5	6	54	6	●
6	R3	7	54	6	●
8	R4	9	58	8	●
10	R5	11	66	10	●
12	R6	12	73	12	●
14	R7	14	75	14	●
16	R8	16	82	16	●
18	R9	18	84	18	●
20	R10	20	92	20	●

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	

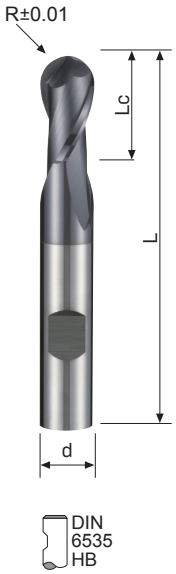


Type of Operation



Code No. F521HX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	AlTiCrN F521HX
2	R1	6	57	6	●
3	R1.5	7	57	6	●
4	R2	8	57	6	●
5	R2.5	10	57	6	●
6	R3	10	57	6	●
8	R4	16	63	8	●
10	R5	19	72	10	●
12	R6	22	83	12	●
14	R7	22	83	14	●
16	R8	26	92	16	●
18	R9	26	92	18	●
20	R10	32	104	20	●



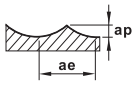
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F520HX / F521HX 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

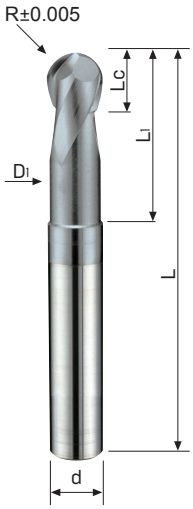
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		120		120		100		80		70		60~80		120		120	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F520HX/F521HX-R1	2	15,500	600	15,500	600	12,500	400	12,500	400	11,000	290	12,500	400	15,500	600	19,000	700
F520HX/F521HX--R1.5	3	10,500	620	10,500	620	8,450	405	8,450	405	7,400	290	8,450	405	10,500	620	12,500	760
F520HX/F521HX--R2	4	7,950	620	7,950	620	6,350	445	6,350	445	5,550	370	6,350	445	7,950	620	9,500	760
F520HX/F521HX--R2.5	5	7,950	620	7,950	620	5,095	445	5,095	445	4,460	370	5,095	445	7,950	620	7,650	760
F520HX/F521HX--R3	6	5,300	670	5,300	670	4,200	465	4,200	465	3,700	390	4,200	465	5,300	670	6,300	800
F520HX/F521HX--R4	8	3,950	790	3,950	790	3,150	555	3,150	555	2,750	455	3,150	555	3,950	790	4,750	950
F520HX/F521HX--R5	10	3,150	745	3,150	745	2,500	525	2,500	525	2,200	430	2,500	525	3,150	745	3,800	890
F520HX/F521HX--R6	12	2,650	700	2,650	700	2,100	490	2,100	490	1,850	430	2,100	490	2,650	700	3,170	840
F520HX/F521HX--R7	14	2,320	600	2,320	600	1,840	430	1,840	430	1,620	375	1,840	430	2,320	600	2,750	690
F520HX/F521HX--R8	16	1,990	525	1,990	525	1,580	370	1,580	370	1,390	325	1,580	370	1,990	525	2,400	630
F520HX/F521HX--R9	18	1,790	470	1,790	470	1,420	330	1,420	330	1,250	290	1,420	330	1,790	470	2,150	560
F520HX/F521HX--R10	20	1,590	420	1,590	420	1,260	290	1,260	290	1,110	260	1,260	290	1,590	420	1,900	500
切入深度 (mm) 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:<1 0.05D ≥1 0.1D		ae:0.1D		ae:0.2D		ae:0.2D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. F623HX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F623HX
1	0.5R	1	50	6	3	0.95	●
1.5	0.75R	2	50	6	4	1.4	●
2	1R	3	57	6	6	1.9	●
3	1.5R	4	57	6	9	2.8	●
4	2R	5	57	6	12	3.7	●
5	2.5R	6	57	6	15	4.6	●
6	3R	7	57	6	20	5.5	●
8	4R	9	63	8	26	7.4	●
10	5R	11	72	10	31	9.2	●
12	6R	13	83	12	37	11	●

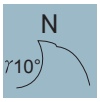


Steel < 48HRC

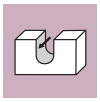
P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiCrN HX

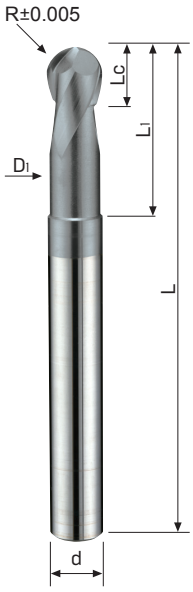


Type of Operation



Code No. F624HX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiCrN F624HX
3	1.5R	4	70	6	9	2.8	●
4	2R	5	70	6	12	3.7	●
5	2R	6	80	6	15	4.6	●
6	3R	7	80	6	20	5.5	●
8	4R	9	100	8	26	7.4	●
10	5R	11	100	10	31	9.2	●
12	6R	13	110	12	37	11	●



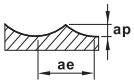
Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

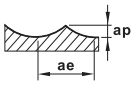
F623HX / F624HX 切削條件參考表

Recommended Milling Conditions

General processing 普通加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		120		120		100		80		70		60		42	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F623HX-R0.5	1	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
F623HX-R0.75	1.5	32,000	680	32,000	680	31,500	620	25,000	400	22,000	280	19,000	200	14,000	130
F623HX-R1	2	19,000	765	19,000	765	15,500	620	12,500	400	11,000	290	9,500	200	7,100	135
F623HX/F624HX-R1.5	3	12,500	765	12,500	765	10,500	630	8,450	400	7,400	290	6,350	200	4,700	140
F623HX/F624HX-R2	4	9,500	765	9,500	765	7,950	630	6,350	450	5,550	370	4,750	270	3,500	170
F623HX/F624HX-R2.5	5	7,600	850	7,600	850	6,350	630	5,050	450	4,450	370	3,800	280	2,860	170
F623HX/F624HX-R3	6	6,350	850	6,350	850	5,300	650	4,200	460	3,700	390	3,150	290	2,300	175
F623HX/F624HX-R4	8	4,750	1,050	4,750	1,050	3,950	780	3,150	550	2,750	450	2,350	325	1,700	200
F623HX/F624HX-R5	10	3,800	950	3,800	950	3,150	740	2,500	525	2,200	430	1,900	330	1,400	200
F623HX/F624HX-R6	12	3,150	890	3,150	890	2,650	700	2,100	490	1,850	430	1,550	310	1,100	190
切入深度 (mm) 		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.1D		ap:0.05D		ap:0.05D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.1D		ae:0.075D		ae:0.075D	

High-speed machining 高速加工

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		300		300		250		220		180		180		126	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F623HX-R0.5	1	50,000	2,800	50,000	2,800	50,000	2,800	50,000	2,500	47,500	2,200	32,000	1,400	25,000	1,000
F623HX-R0.75	1.5	41,800	2,800	41,800	2,800	33,000	2,800	30,000	2,500	26,500	2,200	24,000	1,400	19,500	1,000
F623HX-R1	2	31,500	3,500	31,500	3,500	25,000	2,800	24,500	2,500	23,500	2,250	17,000	1,500	12,500	1,000
F623HX/F624HX-R1.5	3	21,000	3,500	21,000	3,500	16,500	2,800	16,000	2,500	15,500	2,200	11,000	1,500	8,400	950
F623HX/F624HX-R2	4	18,000	3,700	18,000	3,700	15,500	3,200	15,000	2,700	13,500	2,400	11,000	1,900	7,900	1,000
F623HX/F624HX-R2.5	5	15,500	4,000	15,500	4,000	15,000	4,000	14,000	2,800	11,000	2,300	10,000	2,000	7,600	1,200
F623HX/F624HX-R3	6	15,000	4,800	15,000	4,800	13,500	4,300	11,500	2,700	9,500	2,200	9,500	2,200	6,600	1,050
F623HX/F624HX-R4	8	11,500	3,600	11,500	3,600	10,000	3,200	8,900	2,000	7,100	1,700	7,100	1,700	4,900	880
F623HX/F624HX-R5	10	9,500	3,000	9,500	3,000	8,200	2,500	7,100	1,700	5,700	1,300	5,700	1,300	3,900	700
F623HX/F624HX-R6	12	7,900	2,450	7,900	2,450	6,800	2,100	5,900	1,350	4,700	1,000	4,700	1,000	3,300	580
切入深度 (mm) 		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D		ap:0.02D	
		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D		ae:0.02D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

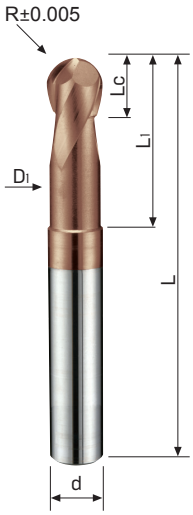
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F625TX / F626TX 極超微粒鎢鋼塗層圓頭立銑刀

Ball Nose End Mills

Code No. F625TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F625TX
1	0.5R	1	50	6	3	0.95	●
1.5	0.75R	2	50	6	4	1.4	●
2	1R	3	57	6	6	1.9	●
3	1.5R	4	57	6	9	2.8	●
4	2R	5	57	6	12	3.7	●
5	2.5R	6	57	6	15	4.6	●
6	3R	7	57	6	20	5.5	●
8	4R	9	63	8	26	7.4	●
10	5R	11	72	10	31	9.2	●
12	6R	13	83	12	37	11	●

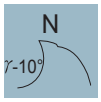


Hardened Steel 40-70HRC

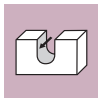
P	H	M	K	N	S
	●				

SMG Carbide

AlTiSiN TX

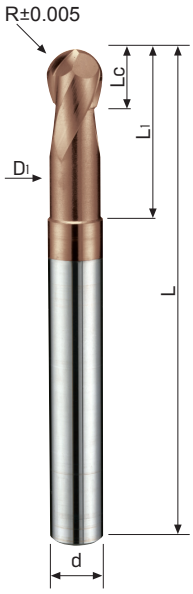


Type of Operation



Code No. F626TX-Dc

Dc 0 -0.02	R ±0.005	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F626TX
3	1.5R	4	70	6	9	2.8	●
4	2R	5	70	6	12	3.7	●
5	2.5R	6	80	6	15	4.6	●
6	3R	7	80	6	20	5.5	●
8	4R	9	100	8	26	7.4	●
10	5R	11	100	10	31	9.2	●
12	6R	13	110	12	37	11	●



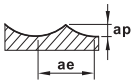
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F625TX / F626TX 切削條件參考表

Recommended Milling Conditions

Finishing 精加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		130		120		90	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F625TX-R0.5	1	20,000	800	15,000	750	15,000	750
F625TX-R0.75	1.5	18,000	1,400	15,000	900	14,000	900
F625TX-R1	2	15,000	1,600	14,000	1,200	14,000	1,260
F625TX/F626TX-R1.5	3	13,000	1,700	12,500	1,500	10,000	1,200
F625TX/F626TX-R2	4	11,000	1,680	10,000	1,560	7,200	1,080
F625TX/F626TX-R2.5	5	10,000	1,600	9,600	1,440	6,800	1,080
F625TX/F626TX-R3	6	6,900	1,450	6,400	1,280	4,800	960
F625TX/F626TX-R4	8	5,200	1,200	4,800	1,060	3,600	790
F625TX/F626TX-R5	10	4,100	1,030	3,800	910	2,900	700
F625TX/F626TX-R6	12	3,500	910	3,200	800	2,400	600
切入深度 (mm) 		ap:0.02D		ap:0.02D		ap:0.02D	
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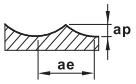
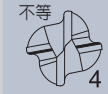
High-speed machining 高速加工

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		235		130		115	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F625TX-R0.5	1	30,000	1,700	24,000	2,000	21,000	1,700
F625TX-R0.75	1.5	30,000	2,400	17,000	2,000	15,000	1,700
F625TX-R1	2	28,000	2,800	14,000	2,100	12,200	1,800
F625TX/F626TX-R1.5	3	21,000	3,000	10,500	2,200	9,000	1,750
F625TX/F626TX-R2	4	18,000	3,200	9,000	2,300	7,900	2,000
F625TX/F626TX-R2.5	5	15,500	3,300	7,800	2,500	6,800	2,000
F625TX/F626TX-R3	6	13,000	3,450	6,500	2,500	5,700	2,200
F625TX/F626TX-R4	8	9,500	3,000	5,200	2,100	4,500	1,900
F625TX/F626TX-R5	10	7,500	2,500	4,200	1,800	3,700	1,700
F625TX/F626TX-R6	12	6,200	2,000	3,600	1,700	3,100	1,450
切入深度 (mm) 		ap:0.02D		ap:0.02D		ap:0.01D	
		ae:0.02D		ae:0.02D		ae:0.01D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

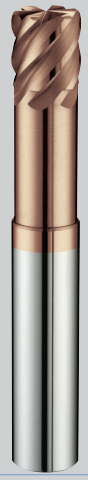
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

高效率立銑刀
High Performance End Mills

Page	251	253	255	257	259	261
Apperance						
Code No	F513SX	F514SX	HF514SX	F674TX	F608HX F609HX	F638TX F649TX
Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide
Coating	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiSiN TX	AlTiCrN HX	AlTiSiN TX
Helix Angle	 38° 41°	 38° 41°	 38° 41°	 42° 45°	 20°	 40° 42°
No.of Flutes	 不等 3	 不等 4	 不等 4	 不等 4	 4	 不等 4

歐規
DIN

7leaders®
The Art of Cutting

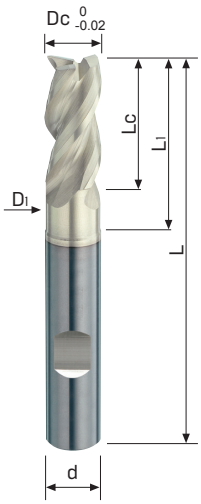
263	265	267	269	271
				
F651SX	F652SX	F653SX	F615TX F619TX	F613TX F614TX
MG Carbide	MG Carbide	MG Carbide	UMG Carbide	SMG Carbide
AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiN+ZrN SX	AlTiSiN TX	AlTiSiN TX
 38°	 38°	 38°	 30°	 45°
 不等 4	 不等 4	 不等 5	 4	 6

F513SX 超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. F513SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+Zrn F513SX
3	8	57	6	14	2.8	●
4	11	57	6	16	3.8	●
5	13	57	6	18	4.8	●
6	13	57	6	20	5.8	●
8	19	63	8	26	7.7	●
10	22	72	10	31	9.7	●
12	26	83	12	37	11.6	●
14	26	83	14	37	13.5	●
16	32	92	16	43	15.5	●
18	32	92	18	43	17.5	●
20	38	104	20	53	19.5	●



DIN 6535 HB

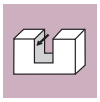
Steel < 48HRC

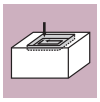
P	H	M	K	N	S
●	●	●	●	○	○

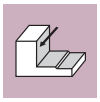
MG Carbide

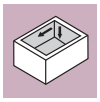
AlTiN+ZrN SX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

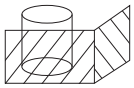
F513SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		100		100		80		65		60		65		100		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F513SX-3	3	9,000	600	9,000	600	6,600	550	6,000	300	3,800	80	6,000	300	9,000	600	3,100	50
F513SX-4	4	6,600	650	6,600	650	5,000	630	4,500	350	2,800	90	4,500	350	6,600	650	2,300	60
F513SX-5	5	5,300	700	5,300	700	4,000	635	3,500	360	2,200	95	3,500	360	5,300	700	1,900	65
F513SX-6	6	5,300	720	5,300	720	4,000	645	3,500	300	2,200	130	3,500	300	5,300	720	1,900	80
F513SX-8	8	4,000	700	4,000	700	3,000	565	2,600	200	1,600	140	2,600	200	4,000	700	1,400	90
F513SX-10	10	3,200	620	3,200	620	2,400	550	2,100	230	1,300	140	2,100	230	3,200	620	1,100	95
F513SX-12	12	2,600	580	2,600	580	2,000	500	1,700	225	1,100	115	1,700	225	2,600	580	1,000	80
F513SX-14	14	2,300	550	2,300	550	1,800	450	1,400	200	900	100	1,400	200	230	550	900	70
F513SX-16	16	2,000	500	2,000	500	1,500	400	1,300	160	830	90	1,300	160	2,000	500	720	65
F513SX-18	18	1,800	450	1,800	450	1,400	350	1,200	140	700	80	1,200	140	1,800	450	650	65
F513SX-20	20	1,500	420	1,500	420	1,200	315	1,000	150	650	70	1,000	150	1,500	420	600	65
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Plunge milling 插銑

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		100		100		80		65		60		65		100		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F513SX-3	3	8,500	320	8,500	320	6,300	200	5,800	110	5,800	110	5,800	105	8,500	320	4,800	80
F513SX-4	4	6,300	350	6,300	350	4,700	205	4,200	110	4,200	110	4,200	110	6,300	350	3,600	85
F513SX-5	5	5,000	350	5,000	350	3,800	210	3,500	120	3,500	120	3,500	125	5,000	350	2,800	90
F513SX-6	6	4,200	380	4,200	380	3,200	220	2,800	130	2,800	130	2,800	120	4,200	380	2,400	95
F513SX-8	8	3,200	350	3,200	350	2,400	210	2,200	120	2,200	120	2,200	120	3,200	350	1,800	85
F513SX-10	10	2,500	300	2,500	300	1,800	180	1,700	100	1,700	100	1,700	105	2,500	300	1,500	70
F513SX-12	12	2,000	300	2,000	300	1,600	190	1,400	100	1,400	100	1,400	100	2,000	300	1,200	70
F513SX-14	14	1,800	200	1,800	200	1,400	160	1,300	80	1,300	80	1,300	80	1,800	200	1,000	60
F513SX-16	16	1,500	180	1,500	180	1,200	140	1,200	80	1,200	80	1,200	80	1,500	180	800	60
F513SX-18	18	1,400	150	1,400	150	1,000	120	1,000	60	1,000	60	1,000	60	1,400	150	700	50
F513SX-20	20	1,300	100	1,300	100	800	80	800	60	800	60	800	60	1,300	100	600	50
切入深度 (mm) 																	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

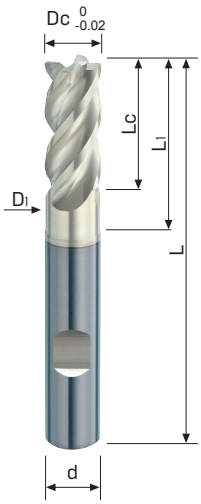
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F514SX 超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. F514SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+ZrN F514SX
3	8	57	6	14	2.8	●
4	11	57	6	16	3.8	●
5	13	57	6	18	4.8	●
6	13	57	6	20	5.8	●
8	19	63	8	26	7.7	●
10	22	72	10	31	9.7	●
12	26	83	12	37	11.6	●
14	26	83	14	37	13.5	●
16	32	92	16	43	15.5	●
18	32	92	18	43	17.5	●
20	38	104	20	53	19.5	●



DIN 6535 HB

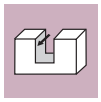
Steel < 48HRC

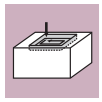
P	H	M	K	N	S
●	●	●	●	○	○

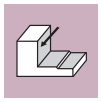
MG Carbide

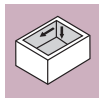
AlTiN+ZrN SX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

F514SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F514SX-3	3	10,600	683	10,600	683	8,280	530	6,550	389	6,400	105	6,550	389	10,600	683	3,200	180
F514SX-4	4	6,350	735	6,350	735	4,950	590	3,950	413	3,800	120	3,950	413	6,350	735	2,400	180
F514SX-5	5	4,550	875	4,550	875	3,550	625	2,800	448	2,730	125	2,800	448	4,550	875	2,000	190
F514SX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
F514SX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
F514SX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
F514SX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
F514SX-14	14	2,048	655	2,048	655	1,706	546	1,365	328	1,251	110	1,365	328	2,048	655	700	150
F514SX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
F514SX-18	18	1,593	637	1,593	637	1,327	425	1,062	297	973	97	1,062	297	1,593	637	500	150
F514SX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	130
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F514SX-3	3	10,600	600	10,600	600	8,280	430	6,550	290	6,400	105	6,550	290	10,600	600	3,200	130
F514SX-4	4	6,350	635	6,350	635	4,950	500	3,950	325	3,800	120	3,950	325	6,350	635	2,400	150
F514SX-5	5	4,550	775	4,550	775	3,550	525	2,800	348	2,730	125	2,800	348	4,550	775	2,000	160
F514SX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
F514SX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
F514SX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
F514SX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
F514SX-14	14	2,048	655	2,048	655	1,706	546	1,365	328	1,251	110	1,365	328	2,048	655	700	150
F514SX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
F514SX-18	18	1,593	637	1,593	637	1,327	425	1,062	297	973	97	1,062	297	1,593	637	500	150
F514SX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

HF514SX 超微粒鎢鋼塗層多用途立銑刀/內冷孔

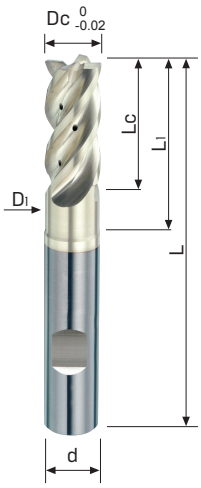
Multipurpose End Mills With Coolant Hole

Code No. HF514SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+ZrN HF514SX
6	13	57	6	20	5.8	——
8	19	63	8	26	7.7	——
10	22	72	10	31	9.7	——
12	26	83	12	37	11.6	——
16	32	92	16	43	15.5	——
20	38	104	20	53	19.5	——

※ Radial coolant hole can be customized. —— in production

※Y型內冷孔可依需求製造生產 ——庫存建立中



DIN 6535 HB

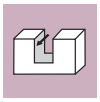
Steel < 48HRC

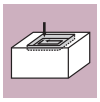
P	H	M	K	N	S
●	●	●	●	○	○

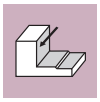
MG Carbide

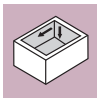
AlTiN+ZrN SX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

HF514SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
HF514SX-6	6	3,540	875	3,540	875	2,760	600	2,200	413	2,100	125	2,200	413	3,540	875	1,600	190
HF514SX-8	8	3,185	770	3,185	770	2,480	600	1,975	413	1,900	125	1,975	413	3,185	770	1,200	170
HF514SX-10	10	3,650	770	3,650	770	2,070	595	1,645	375	1,595	120	1,645	375	3,650	770	1,000	160
HF514SX-12	12	2,275	670	2,275	670	1,770	560	1,410	350	1,365	120	1,410	350	2,275	670	800	160
HF514SX-16	16	1,990	670	1,990	670	1,550	520	1,230	312	1,190	100	1,230	312	1,990	670	600	150
HF514SX-20	20	1,590	535	1,590	535	1,240	415	985	277	950	90	985	277	1,590	535	480	130
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.2D		ae:0.1D		ae:0.2D		ae:0.2D		ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steels		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.15 鈦合金 Titanium	
切削速度 Vc m/min		120		120		80		65		60		65		120		30	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
HF514SX-6	6	3,540	775	3,540	775	2,760	500	2,200	313	2,100	125	2,200	313	3,540	775	1,600	145
HF514SX-8	8	3,185	650	3,185	650	2,480	500	1,975	313	1,900	125	1,975	313	3,185	650	1,200	120
HF514SX-10	10	3,650	670	3,650	670	2,070	490	1,645	288	1,595	120	1,645	288	3,650	670	1,000	145
HF514SX-12	12	2,275	560	2,275	560	1,770	460	1,410	275	1,365	120	1,410	275	2,275	560	800	150
HF514SX-16	16	1,990	660	1,990	660	1,550	420	1,230	240	1,190	100	1,230	240	1,990	660	600	150
HF514SX-20	20	1,590	500	1,590	500	1,240	360	985	200	950	90	985	200	1,590	500	480	130
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.05D		ap:0.5D		ap:0.5D		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

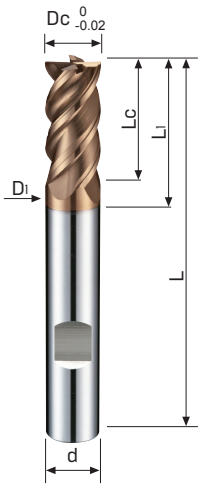
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F674TX 極超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. F674TX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F674TX
6	13	57	6	20	5.8	●
8	19	63	8	26	7.7	●
10	22	72	10	31	9.7	●
12	26	83	12	37	11.6	●
16	32	92	16	43	15.5	●
20	38	104	20	53	19.5	●



DIN 6535 HB

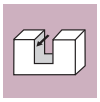
Steel < 60HRC

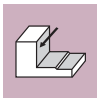
P	H	M	K	N	S
●	●	○	●		○

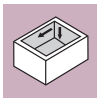
UMG Carbide

AlTiSiN TX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

F674TX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		85		85		75		70		60		30		85	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F674TX-6	6	4,500	610	4,500	610	3,700	425	3,700	425	2,900	145	1,500	70	4,500	610
F674TX-8	8	3,300	590	3,300	590	2,700	425	2,700	425	2,200	145	1,100	65	3,300	590
F674TX-10	10	2,600	580	2,600	580	2,200	420	2,200	420	1,700	145	950	65	2,600	580
F674TX-12	12	2,200	580	2,200	580	1,800	420	1,800	420	1,400	140	800	60	2,200	580
F674TX-16	16	1,600	530	1,600	530	1,300	400	1,300	400	1,200	130	600	45	1,600	530
F674TX-20	20	1,300	510	1,300	510	1,100	370	1,100	370	890	110	470	35	1,300	510
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D		ae:0.1D		ae: 0.1D		ae: 0.1D		ae:0.02D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

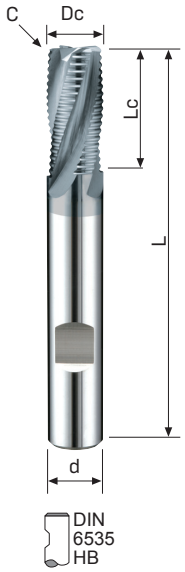
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F608HX / F609HX 極超微粒鎢鋼塗層粗加工立銑刀

Roughing End Mills

Code No. F608HX-Dc-HB

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiCrN F608HX
3	8	57	6	3	0.3	●
4	11	57	6	3	0.3	●
5	13	57	6	3	0.4	●
6	13	57	6	3	0.4	●
8	19	63	8	3	0.4	●
10	22	72	10	4	0.5	●
12	26	83	12	4	0.5	●
14	26	83	14	4	0.5	●
16	32	92	16	4	0.5	●
18	32	92	18	4	0.5	●
20	38	104	20	4	0.5	●



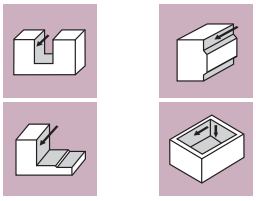
Steel < 48HRC

P	H	M	K	N	S
●	●	○	●		

UMG Carbide

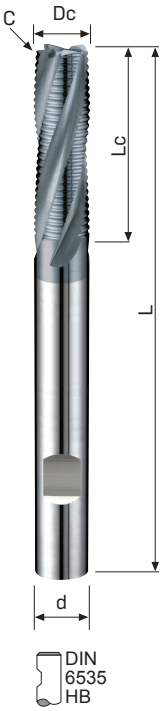
AlTiCrN HX

Type of Operation



Code No. F609HX-Dc-HB

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiCrN F609HX
6	19	63	6	3	0.4	●
8	28	72	8	3	0.4	●
10	34	84	10	4	0.5	●
12	40	97	12	4	0.5	●
16	48	108	16	4	0.5	●
20	56	122	20	4	0.5	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
H	GR5	硬化鋼 38~48HRC Hardened Steel	●
H	GR6	硬化鋼 48~56HRC Hardened Steel	
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
N	GR11	銅 Copper	
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
S	GR16	鎳 Nickel	
S	GR17	耐熱鋼 Heat-resistant Steel	

F608HX / F609HX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		120		120		100		80		65		140	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F608HX-3	3	10,600	1,270	10,600	1,270	9,000	720	6,900	550	5,300	254	12,740	1,020
F608HX-4	4	7,960	955	7,960	955	6,760	540	5,175	420	3,980	238	9,550	955
F608HX-5	5	6,370	764	6,370	764	5,410	432	4,140	330	3,180	216	7,640	764
F608HX/F609HX-6	6	5,300	620	5,300	620	4,500	350	3,400	260	2,600	200	6,300	730
F608HX/F609HX-8	8	4,000	620	4,000	620	3,400	400	2,600	300	2,000	220	4,700	750
F608HX/F609HX-10	10	3,200	630	3,200	630	2,700	420	2,000	320	1,600	250	3,800	750
F608HX/F609HX-12	12	2,600	630	2,600	630	2,200	430	1,700	320	1,350	260	3,200	750
F608HX-14	14	2,250	650	2,250	650	1,950	470	1,500	350	1,150	280	2,750	770
F608HX/F609HX-16	16	2,000	620	2,000	620	1,700	460	1,300	350	1,000	260	2,400	760
F608HX-18	18	1,750	630	1,750	630	1,500	480	1,150	350	900	270	2,100	750
F608HX/F609HX-20	20	1,600	600	1,600	600	1,400	450	1,100	340	790	250	1,900	760
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.4D		ae:0.4D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.4D	

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60		60		50		45		40		60	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F608HX-3	3	6,300	200	6,300	200	5,300	170	4,700	150	4,200	100	6,300	200
F608HX-4	4	4,700	250	4,700	250	3,980	200	3,500	160	3,180	120	4,700	250
F608HX-5	5	3,800	300	3,800	300	3,180	230	2,800	180	2,550	140	3,800	300
F608HX/F609HX-6	6	3,150	315	3,150	315	2,650	260	2,300	180	2,100	160	3,150	315
F608HX/F609HX-8	8	2,350	300	2,350	300	2,000	250	1,750	170	1,600	150	2,350	300
F608HX/F609HX-10	10	1,900	300	1,900	300	1,600	240	1,400	160	1,300	150	1,900	300
F608HX/F609HX-12	12	1,600	280	1,600	280	1,300	230	1,200	160	1,100	140	1,600	280
F608HX-14	14	1,350	280	1,350	280	1,100	235	1,000	150	900	130	1,350	280
F608HX/F609HX-16	16	1,200	270	1,200	270	1,000	225	900	140	800	120	1,200	270
F608HX-18	18	1,000	260	1,000	260	900	240	800	135	700	120	1,000	260
F608HX/F609HX-20	20	950	260	950	260	800	240	700	130	650	125	950	260
切入深度 (mm) 		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D		ap:0.5D	

＊Note that when the end mills diameter less than 6 mm, please adjust proper parameters in accordance with the actual processing conditions.
＊Notice: F609HX is Long Length series End Mills. Please adjust the parameter according

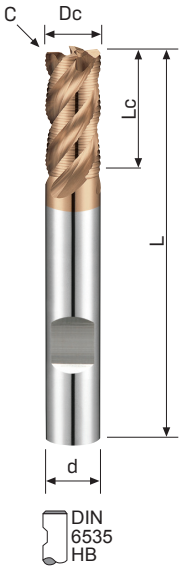
＊注意當銑刀直徑小於6毫米時候，請按照實際的加工情況調整合理的參數。
＊注意F609HX為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

F638TX / F649TX 極超微粒鎢鋼塗層粗加工立銑刀

Roughing End Mills

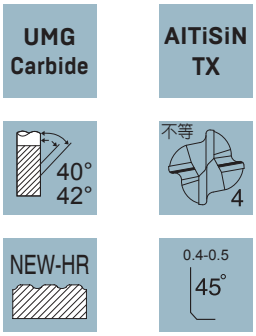
Code No. F638TX-Dc-HB

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiSiN F638TX
6	13	57	6	4	0.4	●
8	19	63	8	4	0.4	●
10	22	72	10	4	0.5	●
12	26	83	12	4	0.5	●
14	26	83	14	4	0.5	●
16	32	92	16	4	0.5	●
18	32	92	18	4	0.5	●
20	38	104	20	4	0.5	●

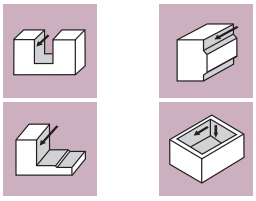


Steel < 60HRC

P	H	M	K	N	S
●	●	●	○		○

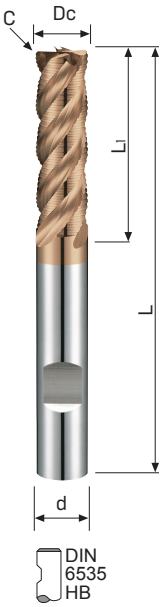


Type of Operation



Code No. F649TX-Dc-HB

Dc h10	Lc mm	L mm	d h5	Z T	C mm	AlTiSiN F649TX
6	19	63	6	4	0.4	●
8	28	72	8	4	0.4	●
10	34	84	10	4	0.5	●
12	40	97	12	4	0.5	●
16	48	108	16	4	0.5	●
20	56	122	20	4	0.5	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
H	GR5	硬化鋼 38~48HRC Hardened Steel	●
H	GR6	硬化鋼 48~56HRC Hardened Steel	○
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
N	GR11	銅 Copper	
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
S	GR16	鎳 Nickel	○
S	GR17	耐熱鋼 Heat-resistant Steel	○

F638TX / F649TX 切削條件參考表

Slotting 溝切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		120		120		100		80		65		80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F638TX/F649TX-6	6	5,300	620	5,300	620	4,500	350	3,400	260	2,600	200	3,400	260
F638TX/F649TX-8	8	4,000	620	4,000	620	3,400	400	2,600	300	2,000	220	2,600	300
F638TX/F649TX-10	10	3,200	630	3,200	630	2,700	420	2,000	320	1,600	250	2,000	320
F638TX/F649TX-12	12	2,600	630	2,600	630	2,200	430	1,700	320	1,350	260	1,700	320
F638TX-14	14	2,250	650	2,250	650	1,950	470	1,500	350	1,150	280	1,500	350
F638TX/F649TX-16	16	2,000	620	2,000	620	1,700	460	1,300	350	1,000	260	1,300	350
F638TX-18	18	1,750	630	1,750	630	1,500	480	1,150	350	900	270	1,150	350
F638TX/F649TX-20	20	1,600	600	1,600	600	1,400	450	1,100	340	790	250	1,100	340
切入深度 (mm) 		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D		ap:1.5D	
		ae:0.4D		ae:0.4D		ae:0.3D		ae:0.3D		ae:0.3D		ae:0.3D	

＊Notice: F649TX is Long Length series End Mills. Please adjust the parameter according.
＊注意F649TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel	
切削速度 Vc m/min		60		60		50		45		40		45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F638TX/F649TX-6	6	3,150	315	3,150	315	2,650	260	2,300	180	2,100	160	2,300	180
F638TX/F649TX-8	8	2,350	300	2,350	300	2,000	250	1,750	170	1,600	150	1,750	170
F638TX/F649TX-10	10	1,900	300	1,900	300	1,600	240	1,400	160	1,300	150	1,400	160
F638TX/F649TX-12	12	1,600	280	1,600	280	1,300	230	1,200	160	1,100	140	1,200	160
F638TX-14	14	1,350	280	1,350	280	1,100	235	1,000	150	900	130	1,000	150
F638TX/F649TX-16	16	1,200	270	1,200	270	1,000	225	900	140	800	120	900	140
F638TX-18	18	1,000	260	1,000	260	900	240	800	135	700	120	800	135
F638TX/F649TX-20	20	950	260	950	260	800	240	700	130	650	125	700	130
切入深度 (mm) 		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D		ap：≤16 1.0D >16 0.5D	

※Note that when the end mills diameter less than 6 mm, please adjust proper parameters in accordance with the actual processing conditions.
※Notice: F649TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意當銑刀直徑小於6毫米時候，請按照實際的加工情況調整合理的參數。
※注意F649TX為加長柄系列銑刀，請按照適當的伸出長度調整刀具的參數。

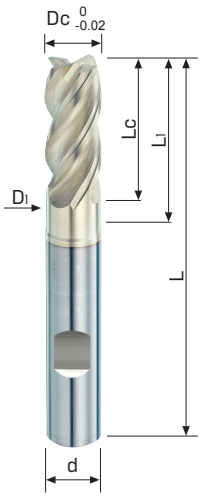
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F651SX 極超微粒鎢鋼塗層多用途立銑刀

Multipurpose End Mills

Code No. F651SX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+ZrN F651SX
3	8	57	6	14	2.8	●
4	11	57	6	16	3.8	●
5	13	57	6	18	4.8	●
6	13	57	6	20	5.8	●
8	19	63	8	26	7.7	●
10	22	72	10	31	9.7	●
12	26	83	12	37	11.6	●
16	32	92	16	43	15.5	●
20	38	104	20	53	19.5	●



DIN 6535 HB

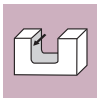
Stainless, Titanium, Nickle

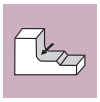
P	H	M	K	N	S
○	○	●			●

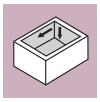
MG Carbide

AlTiN+ZrN SX

Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	○
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	○
H	GR5	硬化鋼 38~48HRC Hardened Steel	○
H	GR6	硬化鋼 48~56HRC Hardened Steel	
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
N	GR11	銅 Copper	
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
S	GR16	鎳 Nickel	●
S	GR17	耐熱鋼 Heat-resistant Steel	●

F651SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel		GR.15鈦合金 Titanium	
切削速度 Vc m/min		75		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F651SX-3	3	7,650	600	4,240	318
F651SX-4	4	6,050	700	3,180	370
F651SX-5	5	5,000	770	2,550	410
F651SX-6	6	4,200	830	2,120	440
F651SX-8	8	3,100	800	1,590	420
F651SX-10	10	2,600	710	1,270	375
F651SX-12	12	2,100	670	1,060	355
F651SX-16	16	1,600	550	800	290
F651SX-20	20	1,250	510	630	270
切入深度 （mm） 		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D	

Slotting 溝切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel		GR.15鈦合金 Titanium	
切削速度 Vc m/min		70		35	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F651SX-3	3	7,450	450	3,715	225
F651SX-4	4	5,500	500	2,780	250
F651SX-5	5	4,500	530	2,230	265
F651SX-6	6	3,700	550	1,860	275
F651SX-8	8	2,800	525	1,400	260
F651SX-10	10	2,300	465	1,115	230
F651SX-12	12	1,850	430	930	215
F651SX-16	16	1,400	370	700	185
F651SX-20	20	1,100	330	560	165
切入深度 （mm） 		ap:0.5D		ap:0.5D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

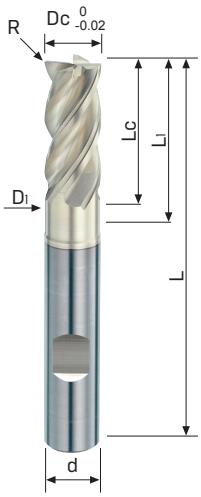
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F652SX 超微粒鎢鋼塗層多用途R角立銑刀

Multipurpose End Mills With Corner Radius

Code No. F652SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+ZrN F652SX
3	R0.2	8	57	6	14	2.8	●
4	R0.2	11	57	6	16	3.8	●
5	R0.2	13	57	6	18	4.8	●
6	R0.2	13	57	6	20	5.8	●
8	R0.2	19	63	8	26	7.7	●
10	R0.2	22	72	10	31	9.7	●
12	R0.2	26	83	12	37	11.6	●
16	R0.2	32	92	16	43	15.5	●
20	R0.2	38	104	20	53	19.5	●
3	R0.5	8	57	6	14	2.8	●
4	R0.5	11	57	6	16	3.8	●
5	R0.5	13	57	6	18	4.8	●
6	R0.5	13	57	6	20	5.8	●
8	R0.5	19	63	8	26	7.7	●
10	R0.5	22	72	10	31	9.7	●
12	R0.5	26	83	12	37	11.6	●
16	R0.5	32	92	16	43	15.5	●
20	R0.5	38	104	20	53	19.5	●
6	R1	13	57	6	20	5.8	●
8	R1	19	63	8	26	7.7	●
10	R1	22	72	10	31	9.7	●
12	R1	26	83	12	37	11.6	●
16	R1	32	92	16	43	15.5	●
20	R1	38	104	20	53	19.5	●
6	R2	13	57	6	20	5.8	●
8	R2	19	63	8	26	7.7	●
10	R2	22	72	10	31	9.7	●
12	R2	26	83	12	37	11.6	●
16	R2	32	92	16	43	15.5	●
20	R2	38	104	20	53	19.5	●
12	R3	26	83	12	37	11.6	●
16	R3	32	92	16	43	15.5	●
20	R3	38	104	20	53	19.5	●



DIN 6535 HB

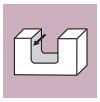
Stainless, Titanium, Nickle

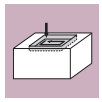
P	H	M	K	N	S
○	○	●			●

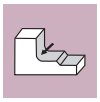
MG Carbide

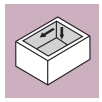
AlTiN+ZrN SX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	○
	GR5	硬化鋼 38~48HRC Hardened Steel	○
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
	GR16	鎳 Nickel	●
	GR17	耐熱鋼 Heat-resistant Steel	●

F652SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel		GR.15鈦合金 Titanium	
切削速度 Vc m/min		75		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F652SX-3	3	7,650	600	4,240	318
F652SX-4	4	6,050	700	3,180	370
F652SX-5	5	5,000	770	2,550	410
F652SX-6	6	4,200	830	2,120	440
F652SX-8	8	3,100	800	1,590	420
F652SX-10	10	2,600	710	1,270	375
F652SX-12	12	2,100	670	1,060	355
F652SX-16	16	1,600	550	800	290
F652SX-20	20	1,250	510	630	270
切入深度 （mm） 		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

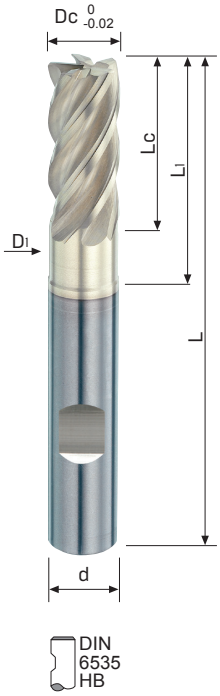
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F653SX 超微粒鎢鋼塗層多用途R角立銑刀

Multipurpose End Mills With Corner Radius

Code No. F653SX-Dc×R

Dc 0 -0.02	R ±0.01	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiN+ZrN F653SX
3	R0.5	8	57	6	14	2.8	●
4	R0.5	11	57	6	16	3.8	●
5	R0.5	13	57	6	18	4.8	●
6	R0.5	13	57	6	20	5.8	●
8	R0.5	19	63	8	26	7.7	●
10	R0.5	22	72	10	31	9.7	●
12	R0.5	26	83	12	37	11.6	●
16	R0.5	32	92	16	43	15.5	●
20	R0.5	38	104	20	53	19.5	●



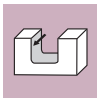
Stainless, Titanium, Nickle

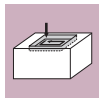
P	H	M	K	N	S
○	○	●			●

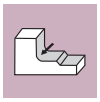
MG Carbide

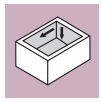
AlTiN+ZrN SX

Type of Operation









Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	○
	GR5	硬化鋼 38~48HRC Hardened Steel	○
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	●
	GR16	鎳 Nickel	●
	GR17	耐熱鋼 Heat-resistant Steel	●

F653SX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.8 不鏽鋼 Stainless Steel		GR.15鈦合金 Titanium	
切削速度 Vc m/min		75		40	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F653SX-3	3	7,650	720	4,240	400
F653SX-4	4	6,050	840	3,180	460
F653SX-5	5	5,000	920	2,550	510
F653SX-6	6	4,200	990	2,120	550
F653SX-8	8	3,100	960	1,590	525
F653SX-10	10	2,600	850	1,270	470
F653SX-12	12	2,100	800	1,060	440
F653SX-16	16	1,600	660	800	360
F653SX-20	20	1,250	615	630	340
切入深度 （mm） 		ap:1.5D		ap:1.5D	
		ae:0.1D		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

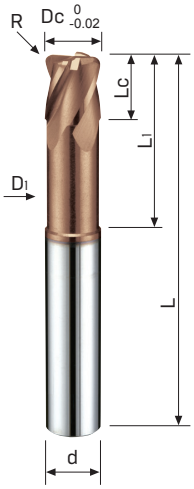
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F615TX / F619TX 極超微粒鎢鋼塗層環面立銑刀

Toric End Mills

Code No. F615TX-Dc×R

Dc 0 -0.02	R 0 +0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F615TX
3	R0.3	4	57	6	14	2.8	●
3	R0.5	4	57	6	14	2.8	●
4	R0.3	5	57	6	16	3.7	●
4	R0.5	5	57	6	16	3.7	●
4	R1	5	57	6	16	3.7	●
6	R0.5	7	57	6	20	5.5	●
6	R1	7	57	6	20	5.5	●
6	R1.5	7	57	6	20	5.5	●
8	R0.5	9	63	8	26	7.4	●
8	R1	9	63	8	26	7.4	●
8	R1.5	9	63	8	26	7.4	●
8	R2	9	63	8	26	7.4	●
10	R0.5	11	72	10	31	9.2	●
10	R1	11	72	10	31	9.2	●
10	R1.5	11	72	10	31	9.2	●
10	R2	11	72	10	31	9.2	●
10	R2.5	11	72	10	31	9.2	●
12	R0.5	13	83	12	37	11	●
12	R1	13	83	12	37	11	●
12	R1.5	13	83	12	37	11	●
12	R2	13	83	12	37	11	●
12	R3	13	83	12	37	11	●
16	R2	17	92	16	43	14.5	●
16	R4	17	92	16	43	14.5	●



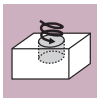
Steel < 62HRC

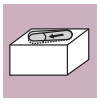
P	H	M	K	N	S
●	●		●		

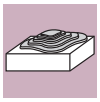
UMG Carbide

AlTiSiN TX

Type of Operation

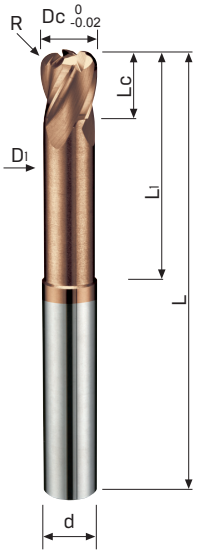






Code No. F619TX-Dc×R

Dc 0 -0.02	R 0 +0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	AlTiSiN F619TX
6	R1.5	7	70	6	33	5.5	●
8	R2	9	80	8	43	7.4	●
10	R2.5	11	90	10	49	9.2	●
12	R3	13	100	12	54	11	●
16	R4	17	115	16	66	14.5	●



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	○
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		135~160		135~160		108~122		69~72		69~72		30~45		135~160	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F615TX-3	3	15,100	715	15,100	715	11,500	500	7,300	450	7,300	450	4,800	220	15,100	715
F615TX-4	4	10,800	720	10,800	720	8,600	515	5,600	500	5,600	500	3,600	250	10,800	720
F615TX-5	5	9,000	730	9,000	730	6,800	515	4,500	550	4,500	550	2,900	280	9,000	730
F615TX/F619TX-6	6	7,200	735	7,200	735	5,800	520	3,700	600	3,700	600	2,400	300	7,200	735
F615TX/F619TX-8	8	5,400	740	5,400	740	4,300	520	2,800	620	2,800	620	1,800	310	5,400	740
F615TX/F619TX-10	10	4,350	755	4,350	755	3,400	540	2,300	620	2,300	620	1,400	300	4,350	755
F615TX/F619TX-12	12	3,600	840	3,600	840	2,900	545	1,900	620	1,900	620	1,200	300	3,600	840
F615TX/F619TX-16	16	3,200	900	3,200	900	2,400	610	1,400	480	1,400	480	900	230	3,200	900
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.05D		ae:0.05D		ae:0.05D		ae: 0.05D		ae:0.05D		ae:0.02D		ae: 0.05D	

※ Notice: F619TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意F619TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

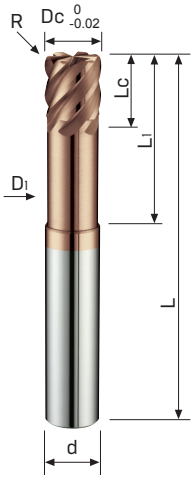
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F613TX / F614TX 極超微粒鎢鋼塗層環面立銑刀

Toric End Mills

Code No. F613TX-Dc×R

Dc 0 -0.02	R 0 +0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	AlTiSiN F613TX
3	R0.5	4	57	6	14	2.8	4	●
4	R0.5	5	57	6	16	3.7	4	●
5	R0.5	6	57	6	18	4.6	4	●
6	R0.5	7	57	6	20	5.5	6	●
8	R0.5	9	63	8	26	7.4	6	●
10	R0.5	11	72	10	31	9.2	6	●
12	R0.5	13	83	12	37	11	6	●
6	R1	7	57	6	20	5.5	6	●
8	R1	9	63	8	26	7.4	6	●
10	R1	11	72	10	31	9.2	6	●
12	R1	13	83	12	37	11	6	●

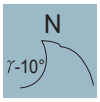


Hardened Steel 40-70HRC

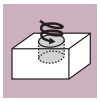
P	H	M	K	N	S
	●		○		

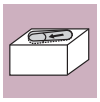
SMG Carbide

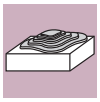
AlTiSiN TX



Type of Operation

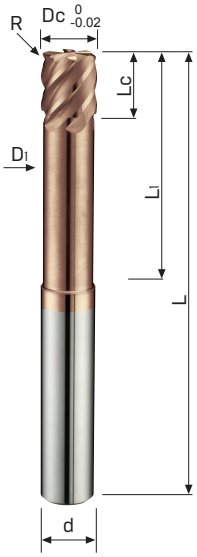






Code No. F614TX-Dc×R

Dc 0 -0.02	R 0 +0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	Z	AlTiSiN F614TX
3	R0.5	4	70	6	27	2.8	4	●
4	R0.5	5	70	6	29	3.7	4	●
5	R0.5	6	70	6	31	4.6	4	●
6	R0.5	7	70	6	33	5.5	6	●
8	R0.5	9	80	8	43	7.4	6	●
10	R0.5	11	90	10	49	9.2	6	●
12	R0.5	13	100	12	54	11	6	●
6	R1	7	70	6	33	5.5	6	●
8	R1	9	80	8	43	7.4	6	●
10	R1	11	90	10	49	9.2	6	●
12	R1	13	100	12	54	11	6	●



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	●
	GR7	硬化鋼 56~68HRC Hardened Steel	●
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	○
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Side Milling 側面切削

被削材 Work Material		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.6 硬化鋼 Hardened Steel (48~56HRC)		GR.7 硬化鋼 Hardened Steel (56~68HRC)	
切削速度 Vc m/min		150		100		90	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F613TX/F614TX-3	3	7,300	450	4,800	220	4,000	150
F613TX/F614TX-4	4	5,600	500	3,600	250	3,200	220
F613TX/F614TX-5	5	4,500	550	2,900	280	2,600	220
F613TX/F614TX-6	6	6,600	2,300	5,300	1,800	4,000	1,000
F613TX/F614TX-8	8	4,900	2,350	4,000	1,850	3,000	1,000
F613TX/F614TX-10	10	4,000	2,400	3,200	1,900	2,400	1,000
F613TX/F614TX-12	12	3,300	2,400	2,600	1,900	2,000	1,000
切入深度 (mm) 		ap:1.0D		ap:1.0D		ap:1.0D	
		ae:0.1D		ae:0.05D		ae:0.03D	

※ Notice: F614TX is Long Length series End Mills. Please adjust the parameter according

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意F614TX為加長柄系列銑刀，請按照適當的伸長度調整刀具的參數。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

鋁用立銑刀
End Mills For Aluminium

Page	275	277	279	281
Apperance				
Code No	F631ZX	F607ZX	F642ZX	F618ZX F620ZX
Carbide	MG Carbide	MG Carbide	MG Carbide	UMG Carbide
Coating	ZrN ZX	ZrN ZX	ZrN ZX	ZrN ZX
Helix Angle	 42° 45°	 42° 45°	 40°	 40°
No.of Flutes	不等  3	不等  3	 3	 2

歐規
DIN

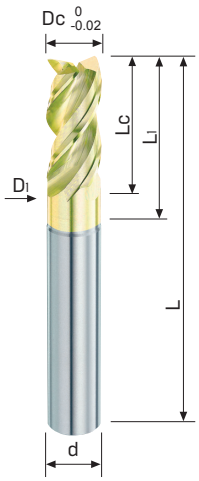
7leaders®
The Art of Cutting

F631ZX 超微粒鎢鋼塗層鋁用立銑刀

End Mills For Aluminium

Code No. F631ZX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	ZrN F631ZX
3	8	57	6	14	2.8	●
4	11	57	6	16	3.8	●
5	13	57	6	18	4.8	●
6	13	57	6	20	5.8	●
8	19	63	8	26	7.7	●
10	22	72	10	31	9.7	●
12	26	83	12	37	11.6	●
16	32	92	16	43	15.5	●
20	38	104	20	53	19.5	●

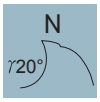


Aluminium

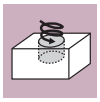
P	H	M	K	N	S
				●	

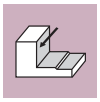
MG Carbide

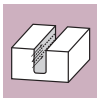
ZrN ZX



Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F631ZX 切削條件參考表

Recommended Milling Conditions

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F631ZX-3	3	42,000	1,900
F631ZX-4	4	31,000	2,200
F631ZX-5	5	25,000	2,200
F631ZX-6	6	21,000	2,400
F631ZX-8	8	16,000	2,600
F631ZX-10	10	12,700	3,000
F631ZX-12	12	10,600	3,200
F631ZX-16	16	8,000	3,200
F631ZX-20	20	6,300	3,100
切入深度 （mm） 		ap:1.5D	
		ae:0.1D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

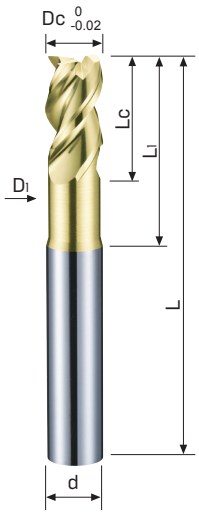
F607ZX 超微粒鎢鋼塗層鋁用立銑刀

Toric End Mills For Aluminium

Code No. F607ZX-Dc

Dc 0 -0.02	Lc mm	L mm	d h5	L1 mm	D1 mm	ZrN F607ZX
3	4.5	57	6	9	2.8	●
4	6	57	6	12	3.7	●
5	7.5	57	6	15	4.6	●
6	9	57	6	20	5.5	●
8	12	63	8	26	7.4	●
10	15	72	10	31	9.2	●
12	18	83	12	37	11	●
16	24	92	16	43	14.5	●
20	30	104	20	53	18.2	●

※Corner radius can be customized.
※R角可依需求製造生產

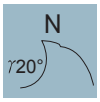


Aluminium

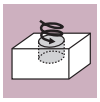
P	H	M	K	N	S
				●	

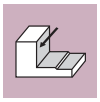
MG Carbide

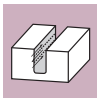
ZrN ZX



Type of Operation







Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

F607ZX 切削條件參考表

Side Milling 側面切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F607ZX-3	3	42,000	1,900
F607ZX-4	4	31,000	2,200
F607ZX-5	5	25,000	2,200
F607ZX-6	6	21,000	3,400
F607ZX-8	8	16,000	2,600
F607ZX-10	10	12,700	3,000
F607ZX-12	12	10,600	3,200
F607ZX-20	20	6,360	1,900
切入深度 （mm） 		ap:0.75D	
		ae:0.3D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

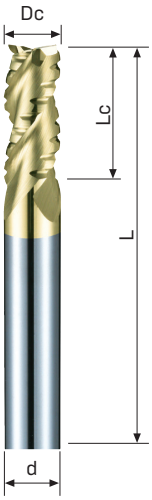
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F642ZX 超微粒鎢鋼塗層粗加工鋁用立銑刀

Roughing End Mills For Aluminium

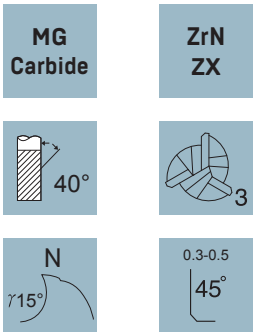
Code No. F642ZX-Dc

Dc h10	Lc mm	L mm	d h5	ZrN F642ZX
6	13	57	6	●
8	19	63	8	●
10	22	72	10	●
12	26	83	12	●
16	32	92	16	●
20	38	104	20	●

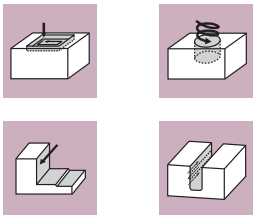


Aluminium

P	H	M	K	N	S
				●	



Type of Operation



Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Slotting 溝切削

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		400	
型號 Code No.	外徑 （mm）	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/min)
F642ZX-6	6	21,000	1,950
F642ZX-8	8	16,000	2,050
F642ZX-10	10	12,700	2,300
F642ZX-12	12	10,600	2,500
F642ZX-16	16	7,900	2,500
F642ZX-20	20	6,300	2,550
切入深度 （mm） 		1.0D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

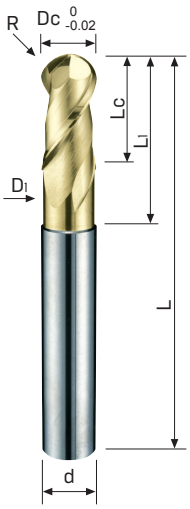
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

F618ZX / F620ZX 極超微粒鎢鋼塗層圓頭鋁用立銑刀

Ball Nose End Mills For Aluminium

Code No. F618ZX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	Lc mm	L1 mm	D1 h5	ZrN F618ZX
3	1.5R	6	57	6	9	2.8	●
4	2R	8	57	6	12	3.7	●
5	2.5R	10	57	6	15	4.6	●
6	3R	12	57	6	20	5.5	●
8	4R	16	63	8	26	7.4	●
10	5R	20	72	10	31	9.2	●
12	6R	24	83	12	37	11	●

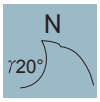


Aluminium

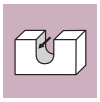
P	H	M	K	N	S
				●	

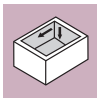
UMG Carbide

ZrN ZX



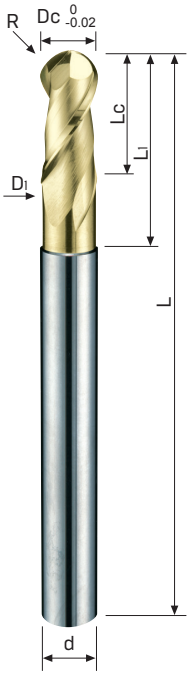
Type of Operation





Code No. F620ZX-Dc

Dc 0 -0.02	R ±0.01	Lc mm	L mm	Lc mm	L1 mm	D1 h5	ZrN F620ZX
3	1.5R	6	70	6	9	2.8	●
4	2R	8	70	6	12	3.7	●
5	2.5R	10	80	6	15	4.6	●
6	3R	12	80	6	20	5.5	●
8	4R	16	100	8	26	7.4	●
10	5R	20	100	10	31	9.2	●
12	6R	24	110	12	37	11	●



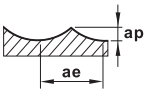
Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

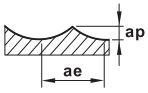
F618ZX / F620ZX 切削條件參考表

Recommended Milling Conditions

Finishing 精加工

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		300	
型號 Code No.	外徑 （mm）	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]
F618ZX/F620ZX-3	3	21,200	1,500
F618ZX/F620ZX-4	4	15,900	1,550
F618ZX/F620ZX-5	5	12,700	1,580
F618ZX/F620ZX-6	6	10,600	1,600
F618ZX/F620ZX-8	8	8,000	1,950
F618ZX/F620ZX-10	10	6,350	1,750
F618ZX/F620ZX-12	12	5,300	1,650
切入深度 （mm） 		ap:0.1D	

High Speed Finishing 高速精加工

被削材 Work Material		GR.10 鋁 Aluminium	
切削速度 Vc m/min		300	
型號 Code No.	外徑 （mm）	RPM 迴轉速度 [min-1]	Feed 進給速度 [mm/min]
F618ZX/F620ZX-3	3	31,800	1,908
F618ZX/F620ZX-4	4	23,850	1,908
F618ZX/F620ZX-5	5	19,080	2,290
F618ZX/F620ZX-6	6	15,900	2,544
F618ZX/F620ZX-8	8	11,925	2,385
F618ZX/F620ZX-10	10	9,540	2,290
F618ZX/F620ZX-12	12	7,950	2,385
切入深度 （mm） 		ap:0.05D	

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

鑽頭
Drills

Page	285	287	289	291	293	295
Apperance						
Code No	D903 D904 D913 D914	D908	D400	D412	D413	D415
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank
Helix Angle	 D		 5XD	 3XD	 5XD	 5XD
No.of Flutes	 2	 2	 2	 2	 2	 3

歐規
DIN

7leaders®
The Art of Cutting

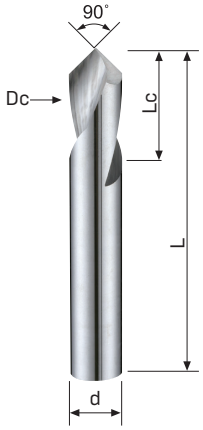
297	299	301	303	305	307	309	311	313
								
D430FN	D433FN	D431FT	D432FT	D435FT	D436FT	D437FT	D441FT D442FT D443FT	D419FT
MG Carbide	MG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide	UMG Carbide
AlTiCrN FN	AlTiCrN FN	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT	AlTiCrN FT
3XD	5XD	3XD	5XD	3XD	5XD	8XD	12XD 16XD 20XD	90° D2 D1
R 2	R 2	R 2	R 2	R 2	R 2	R 2	R 2	R 2

D903 / D904 超微粒鎢鋼NC定點鑽頭90°

NC Spot Drills / 90°

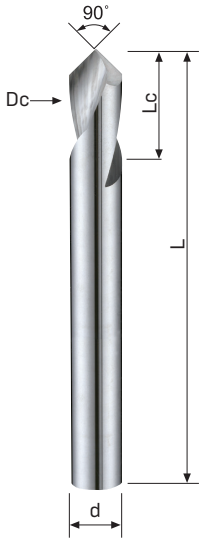
Code No. D903-Dc

Dc h6	Lc mm	L mm	d h6	90° D903
3	10	38	3	●
4	12	50	4	●
5	15	50	5	●
6	20	60	6	●
8	25	60	8	●
10	25	72	10	●
12	30	75	12	●
16	35	100	16	●
20	40	100	20	●



Code No. D904-Dc

Dc h6	Lc mm	L mm	d h6	90° D904
6	20	100	6	●
8	25	125	8	●
10	25	150	10	●
12	30	150	12	●
16	35	150	16	●
20	40	150	20	●

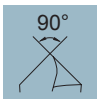


Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	●	○

MG Carbide

Uncoated Blank



Work Material

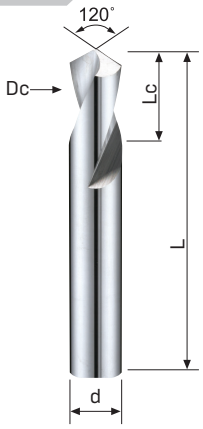
P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D913 / D914 超微粒鎢鋼NC定點鑽頭120°

NC Spot Drills / 120°

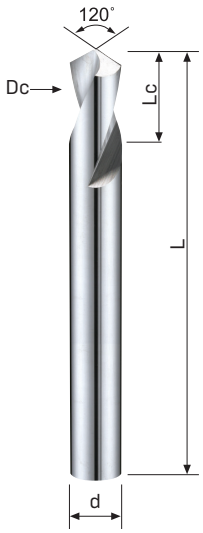
Code No. D913-Dc

Dc h6	Lc mm	L mm	d h6	120° D913
3	10	38	3	●
4	12	50	4	●
5	15	50	5	●
6	20	60	6	●
8	25	60	8	●
10	25	72	10	●
12	30	75	12	●
16	35	100	16	●
20	40	100	20	●



Code No. D914-Dc

Dc h6	Lc mm	L mm	d h6	120° D914
6	20	100	6	●
8	25	125	8	●
10	25	150	10	●
12	30	150	12	●
16	35	150	16	●
20	40	150	20	●



Generic point drilling parameters 適用定點鑽參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		50~60		50~60		40~50		40~50		30~40		20~30		50~60		80~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D903/D904/ D913/D914	3	5,839	0.05	5,839	0.05	4,777	0.03	4,777	0.03	3,715	0.015	2,654	0.035	5,839	0.05	9,555	0.06
D903/D904/ D913/D914	4	4,379	0.065	4,379	0.065	3,583	0.045	3,583	0.05	2,786	0.025	1,990	0.05	4,379	0.065	7,166	0.08
D903/D904/ D913/D914	5	3,503	0.08	3,503	0.08	2,866	0.05	2,866	0.055	2,229	0.025	1,592	0.06	3,503	0.08	5,733	0.1
D903/D904/ D913/D914	6	2,919	0.1	2,919	0.1	2,388	0.06	2,388	0.06	1,857	0.031	1,327	0.07	2,919	0.1	4,777	0.14
D903/D904/ D913/D914	8	2,189	0.125	2,189	0.125	1,791	0.08	1,791	0.08	1,393	0.04	995	0.09	2,189	0.125	3,583	0.17
D903/D904/ D913/D914	10	1,751	0.155	1,751	0.155	1,433	0.1	1,433	0.1	1,114	0.05	796	0.12	1,751	0.155	2,866	0.2
D903/D904/ D913/D914	12	1,459	0.155	1,459	0.155	1,194	0.12	1,194	0.12	928	0.055	663	0.13	1,459	0.155	2,388	0.25
D903/D904/ D913/D914	16	1,094	0.24	1,094	0.24	895	0.15	895	0.15	696	0.075	497	0.175	1,094	0.24	1,791	0.3
D903/D904/ D913/D914	20	875	0.25	875	0.25	716	0.16	716	0.2	557	0.09	398	0.2	875	0.25	1,433	0.32

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

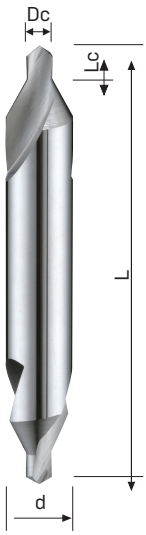
D908 超微粒鎢鋼中心鑽頭/60°

Combined Drill and Countersink / 60° mm

MG Carbide | Uncoated Blank | 60° | 2 | DIN 333 | 120°

Code No. D908-Dc

Dc h7	Lc mm	L mm	d h6	Blank D908
0.5	0.8	38	3	●
0.8	1.1	38	3	●
1	1.3	38	3	●
1.25	1.6	38	3	●
1.6	2	38	4	●
2	2.5	50	5	●
2.5	3.1	50	6	●
3.15	3.9	63	8	●
4	5	66	10	●
5	6.3	73	12	●



Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	●	

Work Material

P	GR1	碳鋼 Carbon Steel	●
P	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
P	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
H	GR5	硬化鋼 38~48HRC Hardened Steel	●
H	GR6	硬化鋼 48~56HRC Hardened Steel	
H	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
N	GR11	銅 Copper	●
N	GR12	塑膠 Plastics	
N	GR13	複合材料 FRP CFRP Composite Material	
N	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
S	GR16	鎳 Nickel	
S	GR17	耐熱鋼 Heat-resistant Steel	

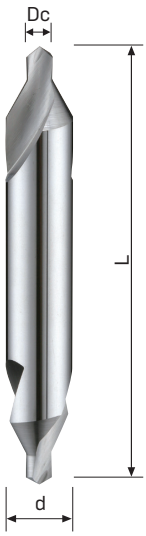
D908 超微粒鎢鋼中心鑽頭/60°

Combined Drill and Countersink / 60° INCH

MG Carbide | Uncoated Blank | 60° | 2 | ANSI | 120°

Code No. D908-Dc

Size No.	Dc h7	L Inch	d h6	Blank D908
#0	1/32	1-1/4	1/8	●
#1	3/64	1-1/4	1/8	●
#2	5/64	1-7/8	3/16	●
#3	7/64	2	1/4	●
#4	1/8	2-1/2	5/16	●
#5	3/16	3	7/16	●
#6	7/32	3	1/2	●
#7	1/4	3-1/4	5/8	●
#8	5/16	3-1/2	3/4	●



General center drill parameters 通用中心鑽參數 mm/公製規格

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		30		30		20		10		10		15		30		60	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D908-D1.0	1	11,147	0.01	11,147	0.01	7,962	0.010	4,777	0.01	4,777	0.005	6,370	0.01	11,147	0.01	22,295	0.02
D908-D1.25	1.25	8,918	0.02	8,918	0.02	6,370	0.02	3,822	0.016	3,822	0.005	5,096	0.015	8,918	0.02	17,836	0.03
D908-D1.6	1.6	6,967	0.03	6,967	0.03	4,976	0.02	2,985	0.02	2,985	0.01	3,981	0.023	6,967	0.03	13,934	0.04
D908-D2.0	2	5,573	0.04	5,573	0.04	3,981	0.03	2,388	0.03	2,388	0.01	3,185	0.03	5,573	0.04	11,147	0
D908-D2.5	2.5	4,459	0.05	4,459	0.05	3,185	0.03	1,911	0.03	1,911	0.015	2,548	0.035	4,459	0.05	8,918	0.06
D908-D3.15	3.15	3,538	0.07	3,538	0.07	2,527	0.045	1,516	0.045	1,516	0.022	2,022	0.05	3,538	0.07	7,077	0.08
D908-D4.0	4	2,786	0.1	2,786	0.1	1,990	0.05	1,194	0.05	1,194	0.025	1,592	0.06	2,786	0.1	5,573	0.06
D908-D5.0	5	2,229	0.11	2,229	0.11	1,592	0.06	955	0.06	955	0.031	1,274	0.07	2,229	0.11	4,459	0.14

General center drill parameters 通用中心鑽參數 INCH/英吋規格

被削材		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.11 銅 Copper	
切削速度 Vc m/min		30		30		20		10		10		15		30		60	
型號	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D908-#0	1/32	12,095	0.02	7,644	0.02	8,063	0.02	4,032	0.016	2,548	0.005	6,047	0.015	7,644	0.02	24,190	0.03
D908-#1	3/64	8,029	0.03	5,972	0.03	5,353	0.02	2,676	0.02	1,991	0.01	4,015	0.023	5,972	0.03	16,059	0.04
D908-#2	5/64	4,826	0.04	4,778	0.04	3,217	0.03	1,609	0.03	1,593	0.01	2,413	0.03	4,778	0.04	9,652	0.05
D908-#3	7/64	3,437	0.05	3,822	0.05	2,291	0.03	1,146	0.03	1,274	0.015	1,719	0.035	3,822	0.05	6,874	0.06
D908-#4	1/8	3,005	0.07	3,033	0.07	2,003	0.045	1,002	0.045	1,011	0.022	1,502	0.05	3,033	0.07	6,009	0.08
D908-#5	3/16	2,007	0.1	2,389	0.1	1,338	0.05	669	0.05	796	0.025	1,004	0.06	2,389	0.1	4,015	0.06
D908-#6	7/32	1,719	0.11	1,911	0.11	1,146	0.06	573	0.06	637	0.031	859	0.07	1,911	0.11	3,437	0.14
D908-#7	1/4	1,505	0.12	1,911	0.12	1,003	0.065	502	0.065	637	0.035	752	0.075	1,911	0.12	3,009	0.15
D908-#8	5/16	1,203	0.13	1,911	0.13	802	0.07	401	0.07	637	0.040	602	0.080	1,911	0.13	2,407	0.16

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

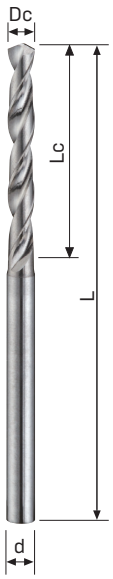
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D400 超微粒鎢鋼微小徑鑽頭

Micro Precision Drills

Code No. D400-Dc

Dc h7	Lc mm	L mm	d h6	Blank D400
0.2	1.2	25	1	●
0.25	1.5	25	1	●
0.3	1.9	25	1	●
0.35	2.4	25	1	●
0.4	3	25	1	●
0.45	3	25	1	●
0.5	3.4	25	1	●
0.55	3.9	25	1	●
0.6	3.9	25	1	●
0.65	4.2	25	1	●
0.7	4.8	25	1	●
0.75	4.8	25	1	●
0.8	5.3	25	1.5	●
0.85	5.3	25	1.5	●
0.9	6	25	1.5	●
0.95	6	25	1.5	●
1	6.8	25	1.5	●
1.05	6.8	25	1.5	●
1.1	7.6	25	1.5	●
1.15	7.6	25	1.5	●
1.2	8.5	25	1.5	●
1.25	8.5	25	1.5	●
1.3	8.5	25	1.5	●
1.35	9.5	25	1.5	●
1.4	9.5	25	1.5	●



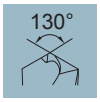
AL,Cu,PVC,CFRP

P	H	M	K	N	S
○			●	●	

MG Carbide

Uncoated Blank

DIN 1899



Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Borehole parameters 鑽孔參數

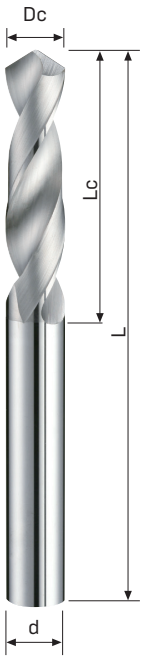
被削材 Work Material		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		32~80		20~45		20~45	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D400-0.2	0.2	25,000	0.004	25,000	0.002	25,000	0.002
D400-0.25	0.25	22,500	0.005	22,500	0.0025	22,500	0.0025
D400-0.3	0.3	20,000	0.007	20,000	0.003	20,000	0.003
D400-0.35	0.35	18,750	0.0085	18,250	0.004	18,250	0.004
D400-0.4	0.4	17,500	0.01	16,500	0.005	16,500	0.005
D400-0.45	0.45	16,250	0.012	14,750	0.006	14,750	0.006
D400-0.5	0.5	15,000	0.015	13,000	0.007	13,000	0.007
D400-0.55	0.55	14,700	0.016	12,340	0.007	12,340	0.007
D400-0.6	0.6	14,400	0.018	11,680	0.007	11,680	0.007
D400-0.65	0.65	14,100	0.020	11,020	0.008	11,020	0.008
D400-0.7	0.7	13,800	0.023	10,360	0.008	10,360	0.008
D400-0.75	0.75	13,500	0.024	9,700	0.0085	9,700	0.0085
D400-0.8	0.8	13,200	0.025	9,040	0.0085	9,040	0.0085
D400-0.85	0.85	12,900	0.026	8,380	0.009	8,380	0.009
D400-0.9	0.9	12,600	0.027	7,720	0.009	7,720	0.009
D400-0.95	0.95	12,300	0.028	7,060	0.0095	7,060	0.0095
D400-1	1	12,000	0.03	6,400	0.01	6,400	0.01

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D412-Dc

Dc h7	Lc mm	L mm	Blank D412	Dc h7	Lc mm	L mm	Blank D412
1	6	26	●	5	26	62	●
1.05	6	26	●	5.1	26	62	●
1.1	7	28	●	5.2	26	62	●
1.15	7	28	●	5.3	26	62	●
1.2	8	30	●	5.4	28	66	●
1.25	8	30	●	5.5	28	66	●
1.3	8	30	●	5.6	28	66	●
1.35	9	32	●	5.7	28	66	●
1.4	9	32	●	5.8	28	66	●
1.45	9	32	●	5.9	28	66	●
1.5	9	32	●	6	28	66	●
1.55	10	34	●	6.1	31	70	●
1.6	10	34	●	6.2	31	70	●
1.65	10	34	●	6.3	31	70	●
1.7	10	34	●	6.4	31	70	●
1.75	11	36	●	6.5	31	70	●
1.8	11	36	●	6.6	31	70	●
1.85	11	36	●	6.7	31	70	●
1.9	11	36	●	6.8	34	74	●
1.95	12	38	●	6.9	34	74	●
2	12	38	●	7	34	74	●
2.05	12	38	●	7.1	34	74	●
2.1	12	38	●	7.2	34	74	●
2.15	13	40	●	7.3	34	74	●
2.2	13	40	●	7.4	34	74	●
2.25	13	40	●	7.5	34	74	●
2.3	13	40	●	7.6	37	79	●
2.35	13	40	●	7.7	37	79	●
2.4	14	43	●	7.8	37	79	●
2.45	14	43	●	7.9	37	79	●
2.5	14	43	●	8	37	79	●
2.55	14	43	●	8.1	37	79	●
2.6	14	43	●	8.2	37	79	●
2.65	14	43	●	8.3	37	79	●
2.7	16	46	●	8.4	37	79	●
2.75	16	46	●	8.5	37	79	●
2.8	16	46	●	8.6	40	84	●
2.85	16	46	●	8.7	40	84	●
2.9	16	46	●	8.8	40	84	●
2.95	16	46	●	8.9	40	84	●
3	16	46	●	9	40	84	●
3.1	18	49	●	9.1	40	84	●
3.2	18	49	●	9.2	40	84	●
3.3	18	49	●	9.3	40	84	●
3.4	20	52	●	9.4	40	84	●
3.5	20	52	●	9.5	40	84	●
3.6	20	52	●	9.6	43	89	●
3.7	20	52	●	9.7	43	89	●
3.8	22	55	●	9.8	43	89	●
3.9	22	55	●	9.9	43	89	●
4	22	55	●	10	43	89	●
4.1	22	55	●	10.2	43	89	●
4.2	22	55	●	10.5	43	89	●
4.3	24	58	●	10.8	47	95	●
4.4	24	58	●	11	47	95	●
4.5	24	58	●	11.5	47	95	●
4.6	24	58	●	12	51	102	●
4.7	24	58	●	12.5	51	102	●
4.8	26	62	●	13	51	102	●
4.9	26	62	●				



AL,Cu,PVC,CFRP

P	H	M	K	N	S
○			●	●	

MG Carbide

Uncoated Blank

DIN 6539

Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D412 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		80~200		40~100		40~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D412-1	1	10,000	0.03	8,800	0.015	8,800	0.015
D412-1.5	1.5	10,000	0.045	8,450	0.02	8,450	0.02
D412-2	2	9,880	0.06	8,100	0.02	8,100	0.02
D412-2.5	2.5	9,740	0.075	7,750	0.02	7,750	0.02
D412-3	3	9,600	0.09	7,400	0.02	7,400	0.02
D412-3.5	3.5	8,600	0.105	6,500	0.02	6,500	0.02
D412-4	4	7,600	0.12	5,600	0.02	5,600	0.02
D412-4.5	4.5	7,000	0.135	5,050	0.025	5,050	0.025
D412-5	5	6,400	0.15	4,500	0.03	4,500	0.03
D412-5.5	5.5	6,000	0.165	4,100	0.03	4,100	0.03
D412-6	6	5,600	0.18	3,700	0.03	3,700	0.03
D412-6.5	6.5	5,300	0.195	3,475	0.03	3,475	0.03
D412-7	7	5,000	0.21	3,250	0.035	3,250	0.035
D412-7.5	7.5	4,700	0.225	3,025	0.035	3,025	0.035
D412-8	8	4,400	0.24	2,800	0.04	2,800	0.04
D412-8.5	8.5	4,250	0.255	2,650	0.04	2,650	0.04
D412-9	9	4,100	0.27	2,500	0.045	2,500	0.045
D412-9.5	9.5	3,950	0.285	2,350	0.045	2,350	0.045
D412-10	10	3,800	0.3	2,200	0.05	2,200	0.05
D412-10.5	10.5	3,725	0.315	2,125	0.05	2,125	0.05
D412-11	11	3,650	0.33	2,050	0.055	2,050	0.055
D412-11.5	11.5	3,575	0.345	1,975	0.055	1,975	0.055
D412-12	12	3,500	0.36	1,900	0.06	1,900	0.06
D412-12.5	12.5	3,400	0.375	1,800	0.065	1,800	0.065
D412-13	13	3,300	0.39	1,700	0.07	1,700	0.07

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D413-Dc

Dc h7	Lc mm	L mm	Blank D413
1	12	34	●
1.1	14	36	●
1.2	16	38	●
1.3	16	38	●
1.4	18	40	●
1.5	18	40	●
1.6	20	43	●
1.7	20	43	●
1.8	22	46	●
1.9	22	46	●
2	24	49	●
2.1	24	49	●
2.2	27	53	●
2.3	27	53	●
2.4	30	57	●
2.5	30	57	●
2.6	30	57	●
2.7	33	61	●
2.8	33	61	●
2.9	33	61	●
3	33	61	●
3.1	36	65	●
3.2	36	65	●
3.3	36	65	●
3.4	39	70	●
3.5	39	70	●
3.6	39	70	●
3.7	39	70	●
3.8	43	75	●
3.9	43	75	●
4	43	75	●
4.1	43	75	●
4.2	43	75	●
4.3	47	80	●
4.4	47	80	●
4.5	47	80	●
4.6	47	80	●
4.7	47	80	●
4.8	52	86	●
4.9	52	86	●
5	52	86	●
5.1	52	86	●
5.2	52	86	●
5.3	52	86	●
5.4	57	93	●
5.5	57	93	●
5.6	57	93	●
5.7	57	93	●
5.8	57	93	●
5.9	57	93	●
6	57	93	●
6.1	63	101	●
6.2	63	101	●
6.3	63	101	●
6.4	63	101	●
6.5	63	101	●
6.6	63	101	●
6.7	63	101	●
6.8	69	109	●
6.9	69	109	●
7	69	109	●
7.1	69	109	●
7.2	69	109	●
7.3	69	109	●
7.4	69	109	●
7.5	69	109	●
7.6	75	117	●
7.7	75	117	●
7.8	75	117	●
7.9	75	117	●
8	75	117	●
8.1	75	117	●
8.2	75	117	●
8.3	75	117	●
8.4	75	117	●
8.5	75	117	●
8.6	81	125	●
8.7	81	125	●
8.8	81	125	●
8.9	81	125	●
9	81	125	●
9.1	81	125	●
9.2	81	125	●
9.3	81	125	●
9.4	81	125	●
9.5	81	125	●
9.6	87	133	●
9.7	87	133	●
9.8	87	133	●
9.9	87	133	●
10	87	133	●
10.2	87	133	●
10.5	87	133	●
10.8	94	142	●
11	94	142	●
11.5	94	142	●
12	101	151	●
12.5	101	151	●
13	101	151	●

AL,Cu,PVC,CFRP

P	H	M	K	N	S
○			●	●	

MG Carbide

Uncoated Blank

5XD

2

DIN 338

118°

Work Material

P	GR1	碳鋼 Carbon Steel	○
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	○
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	○
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	●
	GR13	複合材料 FRP CFRP Composite Material	●
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Borehole parameters 鑽孔參數

被削材 Work Material		GR.10 鋁 Aluminium		GR.11 銅 Copper		GR.12 塑料 Plastics	
切削速度 Vc m/min		80~200		40~100		40~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D413-1	1	10,000	0.03	8,800	0.015	8,800	0.015
D413-1.5	1.5	10,000	0.045	8,450	0.02	8,450	0.02
D413-2	2	9,880	0.06	8,100	0.02	8,100	0.02
D413-2.5	2.5	9,740	0.075	7,750	0.02	7,750	0.02
D413-3	3	9,600	0.09	7,400	0.02	7,400	0.02
D413-3.5	3.5	8,600	0.105	6,500	0.02	6,500	0.02
D413-4	4	7,600	0.12	5,600	0.02	5,600	0.02
D413-4.5	4.5	7,000	0.135	5,050	0.025	5,050	0.025
D413-5	5	6,400	0.15	4,500	0.03	4,500	0.03
D413-5.5	5.5	6,000	0.165	4,100	0.03	4,100	0.03
D413-6	6	5,600	0.18	3,700	0.03	3,700	0.03
D413-6.5	6.5	5,300	0.195	3,475	0.03	3,475	0.03
D413-7	7	5,000	0.21	3,250	0.035	3,250	0.035
D413-7.5	7.5	4,700	0.225	3,025	0.035	3,025	0.035
D413-8	8	4,400	0.24	2,800	0.04	2,800	0.04
D413-8.5	8.5	4,250	0.255	2,650	0.04	2,650	0.04
D413-9	9	4,100	0.27	2,500	0.045	2,500	0.045
D413-9.5	9.5	3,950	0.285	2,350	0.045	2,350	0.045
D413-10	10	3,800	0.3	2,200	0.05	2,200	0.05
D413-10.5	10.5	3,725	0.315	2,125	0.05	2,125	0.05
D413-11	11	3,650	0.33	2,050	0.055	2,050	0.055
D413-11.5	11.5	3,575	0.345	1,975	0.055	1,975	0.055
D413-12	12	3,500	0.36	1,900	0.06	1,900	0.06
D413-12.5	12.5	3,400	0.375	1,800	0.065	1,800	0.065
D413-13	13	3,300	0.39	1,700	0.07	1,700	0.07

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

High performance 3-Flute Drills

Code No. D415-Dc

Dc h7	Lc mm	L mm	Blank D415
3	22	46	●
3.1	24	49	●
3.2	24	49	●
3.3	24	49	●
3.4	27	52	●
3.5	27	52	●
3.6	27	52	●
3.7	27	52	●
3.8	30	55	●
3.9	30	55	●
4	30	55	●
4.1	30	55	●
4.2	30	55	●
4.3	32	58	●
4.4	32	58	●
4.5	32	58	●
4.6	32	58	●
4.7	32	58	●
4.8	35	62	●
4.9	35	62	●
5	35	62	●
5.1	35	62	——
5.2	35	62	●
5.3	35	62	——
5.4	39	66	——
5.5	39	66	●
5.6	39	66	——
5.7	39	66	——
5.8	39	66	●
5.9	39	66	——
6	39	66	●
6.1	42	70	——
6.2	42	70	●
6.3	42	70	——
6.4	42	70	——
6.5	42	70	●
6.6	42	70	——
6.7	42	70	——
6.8	45	74	●
6.9	45	74	——
7	45	74	●
7.1	45	74	——
7.2	45	74	——
7.3	45	74	——
7.4	45	74	——
7.5	45	74	●
7.6	48	79	——
7.7	48	79	——
7.8	48	79	●
7.9	48	79	——
8	48	79	●
8.1	48	79	——
8.2	48	79	●
8.3	48	79	——
8.4	48	79	——
8.5	48	79	●
8.6	52	84	——
8.7	52	84	——
8.8	52	84	——
8.9	52	84	——
9	52	84	●
9.1	52	84	——
9.2	52	84	——
9.3	52	84	——
9.4	52	84	——
9.5	52	84	●
9.6	55	89	——
9.7	55	89	——
9.8	55	89	●
9.9	55	89	——
10	55	89	●
10.2	55	89	●
10.5	55	89	●
11	60	95	●
11.5	60	95	●
11.8	65	102	●
12	65	102	●
12.5	65	102	●
13	65	102	●

※ Mark: ——, On request, no stock

※ 記號 ——，可訂購規格，無現貨

AL,Cu

P	H	M	K	N	S
				●	

MG Carbide

Uncoated Blank

5XD

3

DIN 6539

135°

Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	●
	GR11	銅 Copper	●
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Borehole parameters 鑽孔參數

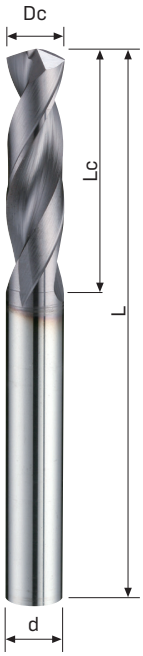
被削材 Work Material		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		120		80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D415-3	3	12,700	0.2	8,400	0.1
D415-3.5	3.5	11,125	0.225	6,900	0.125
D415-4	4	9,550	0.25	6,400	0.15
D415-4.5	4.5	8,400	0.275	5,700	0.200
D415-5	5	7,400	0.3	5,000	0.25
D415-5.5	5.5	6,850	0.33	4,600	0.275
D415-6	6	6,300	0.36	4,200	0.3
D415-6.5	6.5	5,950	0.375	3,950	0.325
D415-7	7	5,550	0.39	3,700	0.35
D415-7.5	7.5	5,170	0.405	3,450	0.375
D415-8	8	4,800	0.42	3,200	0.4
D415-8.5	8.5	4,550	0.465	3,020	0.425
D415-9	9	4,300	0.51	2,850	0.45
D415-9.5	9.5	4,050	0.555	2,670	0.475
D415-10	10	3,800	0.6	2,500	0.5
D415-10.5	10.5	3,650	0.645	2,400	0.525
D415-11	11	3,500	0.69	2,300	0.55
D415-11.5	11.5	3,350	0.735	2,200	0.575
D415-12	12	3,200	0.78	2,100	0.6
D415-12.5	12.5	3,050	0.78	2,050	0.625
D415-13	13	2,900	0.78	2,000	0.65

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D430FN-Dc

Dc h7	Lc mm	L mm	AlTiCrN D430FN	Dc h7	Lc mm	L mm	AlTiCrN D430FN
1	6	26	●	5	26	62	●
1.05	6	26	●	5.1	26	62	●
1.1	7	28	●	5.2	26	62	●
1.15	7	28	●	5.3	26	62	●
1.2	8	30	●	5.4	28	66	●
1.25	8	30	●	5.5	28	66	●
1.3	8	30	●	5.6	28	66	●
1.35	9	32	●	5.7	28	66	●
1.4	9	32	●	5.8	28	66	●
1.45	9	32	●	5.9	28	66	●
1.5	9	32	●	6	28	66	●
1.55	10	34	●	6.1	31	70	●
1.6	10	34	●	6.2	31	70	●
1.65	10	34	●	6.3	31	70	●
1.7	10	34	●	6.4	31	70	●
1.75	11	36	●	6.5	31	70	●
1.8	11	36	●	6.6	31	70	●
1.85	11	36	●	6.7	31	70	●
1.9	11	36	●	6.8	34	74	●
1.95	12	38	●	6.9	34	74	●
2	12	38	●	7	34	74	●
2.05	12	38	●	7.1	34	74	●
2.1	12	38	●	7.2	34	74	●
2.15	13	40	●	7.3	34	74	●
2.2	13	40	●	7.4	34	74	●
2.25	13	40	●	7.5	34	74	●
2.3	13	40	●	7.6	37	79	●
2.35	13	40	●	7.7	37	79	●
2.4	14	43	●	7.8	37	79	●
2.45	14	43	●	7.9	37	79	●
2.5	14	43	●	8	37	79	●
2.55	14	43	●	8.1	37	79	●
2.6	14	43	●	8.2	37	79	●
2.65	14	43	●	8.3	37	79	●
2.7	16	46	●	8.4	37	79	●
2.75	16	46	●	8.5	37	79	●
2.8	16	46	●	8.6	40	84	●
2.85	16	46	●	8.7	40	84	●
2.9	16	46	●	8.8	40	84	●
2.95	16	46	●	8.9	40	84	●
3	16	46	●	9	40	84	●
3.1	18	49	●	9.1	40	84	●
3.2	18	49	●	9.2	40	84	●
3.3	18	49	●	9.3	40	84	●
3.4	20	52	●	9.4	40	84	●
3.5	20	52	●	9.5	40	84	●
3.6	20	52	●	9.6	43	89	●
3.7	20	52	●	9.7	43	89	●
3.8	22	55	●	9.8	43	89	●
3.9	22	55	●	9.9	43	89	●
4	22	55	●	10	43	89	●
4.1	22	55	●	10.2	43	89	●
4.2	22	55	●	10.5	43	89	●
4.3	24	58	●	10.8	47	95	●
4.4	24	58	●	11	47	95	●
4.5	24	58	●	11.5	47	95	●
4.6	24	58	●	12	51	102	●
4.7	24	58	●	12.5	51	102	●
4.8	26	62	●	13	51	102	●
4.9	26	62	●				



Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiCrN FN

3XD

2

DIN 6539

140°

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D430FN 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D430FN-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D430FN-1.5	1.5	15,000	0.045	15,000	0.045	15,000	0.045	8,800	0.04	8,000	0.04	15,000	0.045
D430FN-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D430FN-2.5	2.5	9,500	0.085	9,500	0.085	9,500	0.085	6,300	0.085	5,000	0.085	9,500	0.085
D430FN-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D430FN-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D430FN-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D430FN-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D430FN-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D430FN-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D430FN-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D430FN-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	3,425	0.14	3,425	0.14	3,950	0.14
D430FN-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D430FN-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,075	0.15	2,075	0.15	3,450	0.15
D430FN-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D430FN-8.5	8.5	3,050	0.16	3,050	0.16	3,050	0.16	1,825	0.16	1,825	0.16	3,050	0.16
D430FN-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D430FN-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D430FN-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D430FN-10.5	10.5	2,450	0.18	2,450	0.18	2,450	0.18	1,525	0.18	1,525	0.18	2,450	0.18
D430FN-11	11	2,350	0.19	2,350	0.19	2,350	0.19	1,450	0.19	1,450	0.19	2,350	0.19
D430FN-11.5	11.5	2,225	0.19	2,225	0.19	2,225	0.19	1,375	0.19	1,375	0.19	2,225	0.19
D430FN-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D430FN-12.5	12.5	1,975	0.02	1,975	0.02	1,975	0.02	1,225	0.02	1,225	0.02	1,975	0.02
D430FN-13	13	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D433FN-Dc

Dc h7	Lc mm	L mm	AlTiCrN D433FN
1	12	34	●
1.1	14	36	●
1.2	16	38	●
1.3	16	38	●
1.4	18	40	●
1.5	18	40	●
1.6	20	43	●
1.7	20	43	●
1.8	22	46	●
1.9	22	46	●
2	24	49	●
2.1	24	49	●
2.2	27	53	●
2.3	27	53	●
2.4	30	57	●
2.5	30	57	●
2.6	30	57	●
2.7	33	61	●
2.8	33	61	●
2.9	33	61	●
3	33	61	●
3.1	36	65	●
3.2	36	65	●
3.3	36	65	●
3.4	39	70	●
3.5	39	70	●
3.6	39	70	●
3.7	39	70	●
3.8	43	75	●
3.9	43	75	●
4	43	75	●
4.1	43	75	●
4.2	43	75	●
4.3	47	80	●
4.4	47	80	●
4.5	47	80	●
4.6	47	80	●
4.7	47	80	●
4.8	52	86	●
4.9	52	86	●
5	52	86	●
5.1	52	86	●
5.2	52	86	●
5.3	52	86	●
5.4	57	93	●
5.5	57	93	●
5.6	57	93	●
5.7	57	93	●
5.8	57	93	●
5.9	57	93	●
6	57	93	●
6.1	63	101	●
6.2	63	101	●
6.3	63	101	●
6.4	63	101	●
6.5	63	101	●
6.6	63	101	●
6.7	63	101	●
6.8	69	109	●
6.9	69	109	●
7	69	109	●
7.1	69	109	●
7.2	69	109	●
7.3	69	109	●
7.4	69	109	●
7.5	69	109	●
7.6	75	117	●
7.7	75	117	●
7.8	75	117	●
7.9	75	117	●
8	75	117	●
8.1	75	117	●
8.2	75	117	●
8.3	75	117	●
8.4	75	117	●
8.5	75	117	●
8.6	81	125	●
8.7	81	125	●
8.8	81	125	●
8.9	81	125	●
9	81	125	●
9.1	81	125	●
9.2	81	125	●
9.3	81	125	●
9.4	81	125	●
9.5	81	125	●
9.6	87	133	●
9.7	87	133	●
9.8	87	133	●
9.9	87	133	●
10	87	133	●
10.2	87	133	●
10.5	87	133	●
10.8	94	142	●
11	94	142	●
11.5	94	142	●
12	101	151	●
12.5	101	151	●
13	101	151	●

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	

MG Carbide

AlTiCrN FN

5XD

2

DIN 338

140°

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D433FN 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

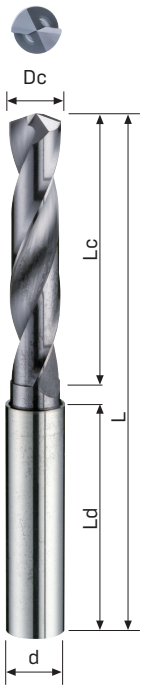
被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D433FN-1	1	19,000	0.03	19,000	0.03	19,000	0.03	12,000	0.02	10,000	0.02	19,000	0.03
D433FN-1.5	1.5	15,000	0.045	15,000	0.045	15,000	0.045	8,800	0.04	8,000	0.04	15,000	0.045
D433FN-2	2	11,000	0.06	11,000	0.06	11,000	0.06	7,600	0.06	6,000	0.06	11,000	0.06
D433FN-2.5	2.5	9,500	0.085	9,500	0.085	9,500	0.085	6,300	0.085	5,000	0.085	9,500	0.085
D433FN-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D433FN-3.5	3.5	7,100	0.09	7,100	0.09	7,100	0.09	4,400	0.09	3,900	0.09	7,100	0.09
D433FN-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D433FN-4.5	4.5	5,600	0.11	5,600	0.11	5,600	0.11	3,400	0.11	3,400	0.11	5,600	0.11
D433FN-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D433FN-5.5	5.5	4,600	0.13	4,600	0.13	4,600	0.13	2,800	0.13	2,800	0.13	4,600	0.13
D433FN-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D433FN-6.5	6.5	3,950	0.14	3,950	0.14	3,950	0.14	3,425	0.14	3,425	0.14	3,950	0.14
D433FN-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D433FN-7.5	7.5	3,450	0.15	3,450	0.15	3,450	0.15	2,075	0.15	2,075	0.15	3,450	0.15
D433FN-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D433FN-8.5	8.5	3,050	0.16	3,050	0.16	3,050	0.16	1,825	0.16	1,825	0.16	3,050	0.16
D433FN-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D433FN-9.5	9.5	2,700	0.17	2,700	0.17	2,700	0.17	1,675	0.17	1,675	0.17	2,700	0.17
D433FN-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D433FN-10.5	10.5	2,450	0.18	2,450	0.18	2,450	0.18	1,525	0.18	1,525	0.18	2,450	0.18
D433FN-11	11	2,350	0.19	2,350	0.19	2,350	0.19	1,450	0.19	1,450	0.19	2,350	0.19
D433FN-11.5	11.5	2,225	0.19	2,225	0.19	2,225	0.19	1,375	0.19	1,375	0.19	2,225	0.19
D433FN-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D433FN-12.5	12.5	1,975	0.02	1,975	0.02	1,975	0.02	1,225	0.02	1,225	0.02	1,975	0.02
D433FN-13	13	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D431FT-Dc

Dc m7	Lc mm	L mm	d h6	AlTiCrN D431FT
3	20	62	6	●
3.1	20	62	6	●
3.2	20	62	6	●
3.3	20	62	6	●
3.4	20	62	6	●
3.5	20	62	6	●
3.6	20	62	6	●
3.7	20	62	6	●
3.8	24	66	6	●
3.9	24	66	6	●
4	24	66	6	●
4.1	24	66	6	●
4.2	24	66	6	●
4.3	24	66	6	●
4.4	24	66	6	●
4.5	24	66	6	●
4.6	24	66	6	●
4.7	24	66	6	●
4.8	28	66	6	●
4.9	28	66	6	●
5	28	66	6	●
5.1	28	66	6	●
5.2	28	66	6	●
5.3	28	66	6	●
5.4	28	66	6	●
5.5	28	66	6	●
5.6	28	66	6	●
5.7	28	66	6	●
5.8	28	66	6	●
5.9	28	66	6	●
6	28	66	6	●
6.1	34	79	8	●
6.2	34	79	8	●
6.3	34	79	8	●
6.4	34	79	8	●
6.5	34	79	8	●
6.6	34	79	8	●
6.7	34	79	8	●
6.8	34	79	8	●
6.9	34	79	8	●
7	34	79	8	●
7.1	41	79	8	●
7.2	41	79	8	●
7.3	41	79	8	●
7.4	41	79	8	●
7.5	41	79	8	●
7.6	41	79	8	●
7.7	41	79	8	●
7.8	41	79	8	●
7.9	41	79	8	●
8	41	79	8	●
8.1	47	89	10	●
8.2	47	89	10	●
8.3	47	89	10	●
8.4	47	89	10	●
8.5	47	89	10	●
8.6	47	89	10	●
8.7	47	89	10	●
8.8	47	89	10	●
8.9	47	89	10	●
9	47	89	10	●
9.1	47	89	10	●
9.2	47	89	10	●
9.3	47	89	10	●
9.4	47	89	10	●
9.5	47	89	10	●
9.6	47	89	10	●
9.7	47	89	10	●
9.8	47	89	10	●
9.9	47	89	10	●
10	47	89	10	●
10.2	55	102	12	●
10.5	55	102	12	●
10.8	55	102	12	●
11	55	102	12	●
11.5	55	102	12	●
12	55	102	12	●
12.5	60	107	14	●
13	60	107	14	●
13.5	60	107	14	●
14	60	107	14	●
14.5	65	115	16	●
15	65	115	16	●
15.5	65	115	16	●
16	65	115	16	●
16.5	73	123	18	●
17	73	123	18	●
17.5	73	123	18	●
18	73	123	18	●
18.5	79	131	20	●
19	79	131	20	●
19.5	79	131	20	●
20	79	131	20	●



Steel < 48HRC

P	H	M	K	N	S
●	●	○	●		○

UMG Carbide

AlTiCrN FT

DIN 6537K

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D431FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D431FT-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D431FT-3.5	3.5	7,100	0.090	7,100	0.090	7,100	0.090	4,400	0.09	3,900	0.09	7,100	0.090
D431FT-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D431FT-4.5	4.5	5,600	0.110	5,600	0.110	5,600	0.110	3,400	0.11	3,400	0.11	5,600	0.110
D431FT-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D431FT-5.5	5.5	4,600	0.130	4,600	0.130	4,600	0.130	2,800	0.13	2,800	0.13	4,600	0.130
D431FT-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D431FT-6.5	6.5	3,950	0.140	3,950	0.140	3,950	0.140	3,425	0.14	3,425	0.14	3,950	0.140
D431FT-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D431FT-7.5	7.5	3,450	0.150	3,450	0.150	3,450	0.150	2,075	0.15	2,075	0.15	3,450	0.150
D431FT-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D431FT-8.5	8.5	3,050	0.160	3,050	0.160	3,050	0.160	1,825	0.16	1,825	0.16	3,050	0.160
D431FT-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D431FT-9.5	9.5	2,700	0.170	2,700	0.170	2,700	0.170	1,675	0.17	1,675	0.17	2,700	0.170
D431FT-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D431FT-10.5	10.5	2,450	0.180	2,450	0.180	2,450	0.180	1,525	0.18	1,525	0.18	2,450	0.180
D431FT-11	11	2,350	0.19	2,350	0.19	2,350	0.19	1,450	0.19	1,450	0.19	2,350	0.19
D431FT-11.5	11.5	2,225	0.190	2,225	0.190	2,225	0.190	1,375	0.19	1,375	0.19	2,225	0.190
D431FT-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D431FT-12.5	12.5	1,975	0.020	1,975	0.020	1,975	0.020	1,225	0.02	1,225	0.02	1,975	0.020
D431FT-13	13	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21
D431FT-13.5	13.5	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21
D431FT-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D431FT-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,075	0.22	1,075	0.22	1,750	0.22
D431FT-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D431FT-15.5	15.5	1,650	0.24	1,650	0.24	1,650	0.24	980	0.24	980	0.24	1,650	0.24
D431FT-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25
D431FT-16.5	16.5	1,550	0.25	1,550	0.25	1,550	0.25	925	0.25	925	0.25	1,550	0.25
D431FT-17	17	1,500	0.26	1,500	0.26	1,500	0.26	900	0.26	900	0.26	1,500	0.26
D431FT-17.5	17.5	1,450	0.26	1,450	0.26	1,450	0.26	875	0.26	875	0.26	1,450	0.26
D431FT-18	18	1,400	0.28	1,400	0.28	1,400	0.28	850	0.28	850	0.28	1,400	0.28
D431FT-18.5	18.5	1,400	0.28	1,400	0.28	1,400	0.28	825	0.28	825	0.28	1,400	0.28
D431FT-19	19	1,350	0.29	1,350	0.29	1,350	0.29	800	0.29	800	0.29	1,350	0.29
D431FT-19.5	19.5	1,350	0.29	1,350	0.29	1,350	0.29	780	0.29	780	0.29	1,350	0.29
D431FT-20	20	1,300	0.30	1,300	0.30	1,300	0.30	760	0.30	760	0.30	1,300	0.30

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. D432FT-Dc

Dc m7	Lc mm	L mm	d h6	AlTiCrN D432FT
3	28	66	6	●
3.1	28	66	6	●
3.2	28	66	6	●
3.3	28	66	6	●
3.4	28	66	6	●
3.5	28	66	6	●
3.6	28	66	6	●
3.7	28	66	6	●
3.8	36	74	6	●
3.9	36	74	6	●
4	36	74	6	●
4.1	36	74	6	●
4.2	36	74	6	●
4.3	36	74	6	●
4.4	36	74	6	●
4.5	36	74	6	●
4.6	36	74	6	●
4.7	36	74	6	●
4.8	44	82	6	●
4.9	44	82	6	●
5	44	82	6	●
5.1	44	82	6	●
5.2	44	82	6	●
5.3	44	82	6	●
5.4	44	82	6	●
5.5	44	82	6	●
5.6	44	82	6	●
5.7	44	82	6	●
5.8	44	82	6	●
5.9	44	82	6	●
6	44	82	6	●
6.1	53	91	8	●
6.2	53	91	8	●
6.3	53	91	8	●
6.4	53	91	8	●
6.5	53	91	8	●
6.6	53	91	8	●
6.7	53	91	8	●
6.8	53	91	8	●
6.9	53	91	8	●
7	53	91	8	●
7.1	53	91	8	●
7.2	53	91	8	●
7.3	53	91	8	●
7.4	53	91	8	●
7.5	53	91	8	●
7.6	53	91	8	●
7.7	53	91	8	●
7.8	53	91	8	●
7.9	53	91	8	●
8	53	91	8	●
8.1	61	103	10	●
8.2	61	103	10	●
8.3	61	103	10	●
8.4	61	103	10	●
8.5	61	103	10	●
8.6	61	103	10	●
8.7	61	103	10	●
8.8	61	103	10	●
8.9	61	103	10	●
9	61	103	10	●
9.1	61	103	10	●
9.2	61	103	10	●
9.3	61	103	10	●
9.4	61	103	10	●
9.5	61	103	10	●
9.6	61	103	10	●
9.7	61	103	10	●
9.8	61	103	10	●
9.9	61	103	10	●
10	61	103	10	●
10.2	71	118	12	●
10.5	71	118	12	●
10.8	71	118	12	●
11	71	118	12	●
11.5	71	118	12	●
12	71	118	12	●
12.5	77	124	14	●
13	77	124	14	●
13.5	77	124	14	●
14	77	124	14	●
14.5	83	133	16	●
15	83	133	16	●
15.5	83	133	16	●
16	83	133	16	●
16.5	93	143	18	●
17	93	143	18	●
17.5	93	143	18	●
18	93	143	18	●
18.5	101	153	20	●
19	101	153	20	●
19.5	101	153	20	●
20	101	153	20	●

Steel < 48HRC

P	H	M	K	N	S
●	●	○	●		○

UMG Carbide

AlTiCrN FT

DIN 6537L

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D432FT-3	3	8,000	0.09	8,000	0.09	8,000	0.09	5,000	0.09	4,000	0.09	8,000	0.09
D432FT-3.5	3.5	7,100	0.090	7,100	0.090	7,100	0.090	4,400	0.09	3,900	0.09	7,100	0.090
D432FT-4	4	6,300	0.10	6,300	0.10	6,300	0.10	3,800	0.10	3,800	0.10	6,300	0.10
D432FT-4.5	4.5	5,600	0.110	5,600	0.110	5,600	0.110	3,400	0.11	3,400	0.11	5,600	0.110
D432FT-5	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D432FT-5.5	5.5	4,600	0.130	4,600	0.130	4,600	0.130	2,800	0.13	2,800	0.13	4,600	0.130
D432FT-6	6	4,200	0.14	4,200	0.14	4,200	0.14	2,600	0.14	2,600	0.14	4,200	0.14
D432FT-6.5	6.5	3,950	0.140	3,950	0.140	3,950	0.140	3,425	0.14	3,425	0.14	3,950	0.140
D432FT-7	7	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D432FT-7.5	7.5	3,450	0.150	3,450	0.150	3,450	0.150	2,075	0.15	2,075	0.15	3,450	0.150
D432FT-8	8	3,200	0.16	3,200	0.16	3,200	0.16	1,900	0.16	1,900	0.16	3,200	0.16
D432FT-8.5	8.5	3,050	0.160	3,050	0.160	3,050	0.160	1,825	0.16	1,825	0.16	3,050	0.160
D432FT-9	9	2,870	0.17	2,870	0.17	2,870	0.17	1,750	0.17	1,750	0.17	2,870	0.17
D432FT-9.5	9.5	2,700	0.170	2,700	0.170	2,700	0.170	1,675	0.17	1,675	0.17	2,700	0.170
D432FT-10	10	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18
D432FT-10.5	10.5	2,450	0.180	2,450	0.180	2,450	0.180	1,525	0.18	1,525	0.18	2,450	0.180
D432FT-11	11	2,350	0.19	2,350	0.19	2,350	0.19	1,450	0.19	1,450	0.19	2,350	0.19
D432FT-11.5	11.5	2,225	0.190	2,225	0.190	2,225	0.190	1,375	0.19	1,375	0.19	2,225	0.190
D432FT-12	12	2,100	0.20	2,100	0.20	2,100	0.20	1,300	0.20	1,300	0.20	2,100	0.20
D432FT-12.5	12.5	1,975	0.020	1,975	0.020	1,975	0.020	1,225	0.02	1,225	0.02	1,975	0.020
D432FT-13	13	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21
D432FT-13.5	13.5	1,850	0.21	1,850	0.21	1,850	0.21	1,150	0.21	1,150	0.21	1,850	0.21
D432FT-14	14	1,800	0.22	1,800	0.22	1,800	0.22	1,100	0.22	1,100	0.22	1,800	0.22
D432FT-14.5	14.5	1,750	0.22	1,750	0.22	1,750	0.22	1,075	0.22	1,075	0.22	1,750	0.22
D432FT-15	15	1,700	0.23	1,700	0.23	1,700	0.23	1,025	0.23	1,025	0.23	1,700	0.23
D432FT-15.5	15.5	1,650	0.24	1,650	0.24	1,650	0.24	980	0.24	980	0.24	1,650	0.24
D432FT-16	16	1,600	0.25	1,600	0.25	1,600	0.25	950	0.25	950	0.25	1,600	0.25
D432FT-16.5	16.5	1,550	0.25	1,550	0.25	1,550	0.25	925	0.25	925	0.25	1,550	0.25
D432FT-17	17	1,500	0.26	1,500	0.26	1,500	0.26	900	0.26	900	0.26	1,500	0.26
D432FT-17.5	17.5	1,450	0.26	1,450	0.26	1,450	0.26	875	0.26	875	0.26	1,450	0.26
D432FT-18	18	1,400	0.28	1,400	0.28	1,400	0.28	850	0.28	850	0.28	1,400	0.28
D432FT-18.5	18.5	1,400	0.28	1,400	0.28	1,400	0.28	825	0.28	825	0.28	1,400	0.28
D432FT-19	19	1,350	0.29	1,350	0.29	1,350	0.29	800	0.29	800	0.29	1,350	0.29
D432FT-19.5	19.5	1,350	0.29	1,350	0.29	1,350	0.29	780	0.29	780	0.29	1,350	0.29
D432FT-20	20	1,300	0.30	1,300	0.30	1,300	0.30	760	0.30	760	0.30	1,300	0.30

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

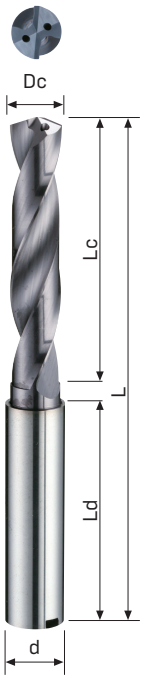
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D435FT 極超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D435FT-Dc

Dc m7	Lc mm	L mm	d h6	AlTiCrN D435FT
3	20	62	6	●
3.1	20	62	6	●
3.2	20	62	6	●
3.3	20	62	6	●
3.4	20	62	6	●
3.5	20	62	6	●
3.6	20	62	6	●
3.7	20	62	6	●
3.8	24	66	6	●
3.9	24	66	6	●
4	24	66	6	●
4.1	24	66	6	●
4.2	24	66	6	●
4.3	24	66	6	●
4.4	24	66	6	●
4.5	24	66	6	●
4.6	24	66	6	●
4.7	24	66	6	●
4.8	28	66	6	●
4.9	28	66	6	●
5	28	66	6	●
5.1	28	66	6	●
5.2	28	66	6	●
5.3	28	66	6	●
5.4	28	66	6	●
5.5	28	66	6	●
5.6	28	66	6	●
5.7	28	66	6	●
5.8	28	66	6	●
5.9	28	66	6	●
6	28	66	6	●
6.1	34	79	8	●
6.2	34	79	8	●
6.3	34	79	8	●
6.4	34	79	8	●
6.5	34	79	8	●
6.6	34	79	8	●
6.7	34	79	8	●
6.8	34	79	8	●
6.9	34	79	8	●
7	34	79	8	●
7.1	41	79	8	●
7.2	41	79	8	●
7.3	41	79	8	●
7.4	41	79	8	●
7.5	41	79	8	●
7.6	41	79	8	●
7.7	41	79	8	●
7.8	41	79	8	●
7.9	41	79	8	●
8	41	79	8	●
8.1	47	89	10	●
8.2	47	89	10	●
8.3	47	89	10	●
8.4	47	89	10	●
8.5	47	89	10	●
8.6	47	89	10	●
8.7	47	89	10	●
8.8	47	89	10	●
8.9	47	89	10	●
9	47	89	10	●
9.1	47	89	10	●
9.2	47	89	10	●
9.3	47	89	10	●
9.4	47	89	10	●
9.5	47	89	10	●
9.6	47	89	10	●
9.7	47	89	10	●
9.8	47	89	10	●
9.9	47	89	10	●
10	47	89	10	●
10.2	55	102	12	●
10.5	55	102	12	●
10.8	55	102	12	●
11	55	102	12	●
11.5	55	102	12	●
12	55	102	12	●
12.5	60	107	14	●
13	60	107	14	●
13.5	60	107	14	●
14	60	107	14	●
14.5	65	115	16	●
15	65	115	16	●
15.5	65	115	16	●
16	65	115	16	●
16.5	73	123	18	●
17	73	123	18	●
17.5	73	123	18	●
18	73	123	18	●
18.5	79	131	20	●
19	79	131	20	●
19.5	79	131	20	●
20	79	131	20	●



Steel < 48HRC

P	H	M	K	N	S
●	●	●	●		○

UMG Carbide

AlTiCrN FT

DIN 6537K

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D435FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D435FT-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D435FT-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D435FT-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D435FT-4.5	4.5	8,500	0.11	8,500	0.11	8,500	0.11	4,200	0.11	3,600	0.09	4,250	0.11	8,500	0.11
D435FT-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D435FT-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,920	0.11	3,500	0.13	7,000	0.13
D435FT-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D435FT-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.15	2,480	0.12	3,000	0.15	6,000	0.14
D435FT-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	2,320	0.13	2,800	0.15	5,600	0.15
D435FT-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	2,160	0.13	2,600	0.15	5,200	0.15
D435FT-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D435FT-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D435FT-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.14	2,150	0.17	4,300	0.17
D435FT-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.14	2,025	0.17	4,050	0.17
D435FT-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D435FT-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D435FT-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D435FT-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D435FT-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D435FT-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,530	0.20	3,075	0.20
D435FT-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.17	1,475	0.21	2,950	0.21
D435FT-13.5	13.5	2,825	0.21	2,825	0.21	2,825	0.21	1,410	0.21	1,225	0.17	1,410	0.21	2,825	0.21
D435FT-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D435FT-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D435FT-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D435FT-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,230	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D435FT-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25
D435FT-16.5	16.5	2,325	0.26	2,325	0.26	2,325	0.26	1,175	0.26	975	0.20	1,175	0.26	2,325	0.26
D435FT-17	17	2,250	0.27	2,250	0.27	2,250	0.27	1,150	0.27	950	0.21	1,150	0.27	2,250	0.27
D435FT-17.5	17.5	2,175	0.27	2,175	0.27	2,175	0.27	1,125	0.27	925	0.22	1,125	0.27	2,175	0.27
D435FT-18	18	2,100	0.28	2,100	0.28	2,100	0.28	1,100	0.28	900	0.23	1,100	0.28	2,100	0.28
D435FT-18.5	18.5	2,050	0.28	2,050	0.28	2,050	0.28	1,075	0.28	875	0.23	1,065	0.28	2,050	0.28
D435FT-19	19	2,000	0.29	2,000	0.29	2,000	0.29	1,050	0.29	850	0.24	1,025	0.29	2,000	0.29
D435FT-19.5	19.5	1,950	0.29	1,950	0.29	1,950	0.29	1,025	0.29	825	0.24	980	0.29	1,950	0.29
D435FT-20	20	1,900	0.30	1,900	0.30	1,900	0.30	1,000	0.30	800	0.25	950	0.30	1,900	0.30

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D436FT 極超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D436FT-Dc

Dc m7	Lc mm	L mm	d h6	AlTiCrN D436FT
3	28	66	6	●
3.1	28	66	6	●
3.2	28	66	6	●
3.3	28	66	6	●
3.4	28	66	6	●
3.5	28	66	6	●
3.6	28	66	6	●
3.7	28	66	6	●
3.8	36	74	6	●
3.9	36	74	6	●
4	36	74	6	●
4.1	36	74	6	●
4.2	36	74	6	●
4.3	36	74	6	●
4.4	36	74	6	●
4.5	36	74	6	●
4.6	36	74	6	●
4.7	36	74	6	●
4.8	44	82	6	●
4.9	44	82	6	●
5	44	82	6	●
5.1	44	82	6	●
5.2	44	82	6	●
5.3	44	82	6	●
5.4	44	82	6	●
5.5	44	82	6	●
5.6	44	82	6	●
5.7	44	82	6	●
5.8	44	82	6	●
5.9	44	82	6	●
6	44	82	6	●
6.1	53	91	8	●
6.2	53	91	8	●
6.3	53	91	8	●
6.4	53	91	8	●
6.5	53	91	8	●
6.6	53	91	8	●
6.7	53	91	8	●
6.8	53	91	8	●
6.9	53	91	8	●
7	53	91	8	●
7.1	53	91	8	●
7.2	53	91	8	●
7.3	53	91	8	●
7.4	53	91	8	●
7.5	53	91	8	●
7.6	53	91	8	●
7.7	53	91	8	●
7.8	53	91	8	●
7.9	53	91	8	●
8	53	91	8	●
8.1	61	103	10	●
8.2	61	103	10	●
8.3	61	103	10	●
8.4	61	103	10	●
8.5	61	103	10	●
8.6	61	103	10	●
8.7	61	103	10	●
8.8	61	103	10	●
8.9	61	103	10	●
9	61	103	10	●
9.1	61	103	10	●
9.2	61	103	10	●
9.3	61	103	10	●
9.4	61	103	10	●
9.5	61	103	10	●
9.6	61	103	10	●
9.7	61	103	10	●
9.8	61	103	10	●
9.9	61	103	10	●
10	61	103	10	●
10.2	71	118	12	●
10.5	71	118	12	●
10.8	71	118	12	●
11	71	118	12	●
11.5	71	118	12	●
12	71	118	12	●
12.5	77	124	14	●
13	77	124	14	●
13.5	77	124	14	●
14	77	124	14	●
14.5	83	133	16	●
15	83	133	16	●
15.5	83	133	16	●
16	83	133	16	●
16.5	93	143	18	●
17	93	143	18	●
17.5	93	143	18	●
18	93	143	18	●
18.5	101	153	20	●
19	101	153	20	●
19.5	101	153	20	●
20	101	153	20	●

Steel < 48HRC

P	H	M	K	N	S
●	●	●	●		○

UMG Carbide

AlTiCrN FT

5XD

2

DIN 6537K

140°

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D436FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D436FT-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D436FT-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D436FT-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D436FT-4.5	4.5	8,500	0.11	8,500	0.11	8,500	0.11	4,200	0.11	3,600	0.09	4,250	0.11	8,500	0.11
D436FT-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D436FT-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,920	0.11	3,500	0.13	7,000	0.13
D436FT-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D436FT-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.15	2,480	0.12	3,000	0.15	6,000	0.14
D436FT-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	2,320	0.13	2,800	0.15	5,600	0.15
D436FT-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	2,160	0.13	2,600	0.15	5,200	0.15
D436FT-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D436FT-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D436FT-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.14	2,150	0.17	4,300	0.17
D436FT-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.14	2,025	0.17	4,050	0.17
D436FT-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D436FT-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D436FT-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D436FT-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D436FT-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D436FT-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,530	0.20	3,075	0.20
D436FT-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.17	1,475	0.21	2,950	0.21
D436FT-13.5	13.5	2,825	0.21	2,825	0.21	2,825	0.21	1,410	0.21	1,225	0.17	1,410	0.21	2,825	0.21
D436FT-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D436FT-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D436FT-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D436FT-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,230	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D436FT-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25
D436FT-16.5	16.5	2,325	0.26	2,325	0.26	2,325	0.26	1,175	0.26	975	0.20	1,175	0.26	2,325	0.26
D436FT-17	17	2,250	0.27	2,250	0.27	2,250	0.27	1,150	0.27	950	0.21	1,150	0.27	2,250	0.27
D436FT-17.5	17.5	2,175	0.27	2,175	0.27	2,175	0.27	1,125	0.27	925	0.22	1,125	0.27	2,175	0.27
D436FT-18	18	2,100	0.28	2,100	0.28	2,100	0.28	1,100	0.28	900	0.23	1,100	0.28	2,100	0.28
D436FT-18.5	18.5	2,050	0.28	2,050	0.28	2,050	0.28	1,075	0.28	875	0.23	1,065	0.28	2,050	0.28
D436FT-19	19	2,000	0.29	2,000	0.29	2,000	0.29	1,050	0.29	850	0.24	1,025	0.29	2,000	0.29
D436FT-19.5	19.5	1,950	0.29	1,950	0.29	1,950	0.29	1,025	0.29	825	0.24	980	0.29	1,950	0.29
D436FT-20	20	1,900	0.30	1,900	0.30	1,900	0.30	1,000	0.30	800	0.25	950	0.30	1,900	0.30

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D437FT 極超微粒鎢鋼塗層内冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D437FT-Dc

Dc m7	Lc mm	L mm	d h6	AlTiCrN D437FT
3	34	74	6	●
3.1	34	74	6	●
3.2	34	74	6	●
3.3	34	74	6	●
3.4	34	74	6	●
3.5	34	74	6	●
3.6	34	74	6	●
3.7	34	74	6	●
3.8	45	85	6	●
3.9	45	85	6	●
4	45	85	6	●
4.1	45	85	6	●
4.2	45	85	6	●
4.3	45	85	6	●
4.4	45	85	6	●
4.5	45	85	6	●
4.6	45	85	6	●
4.7	45	85	6	●
4.8	57	97	6	●
4.9	57	97	6	●
5	57	97	6	●
5.1	57	97	6	●
5.2	57	97	6	●
5.3	57	97	6	●
5.4	57	97	6	●
5.5	57	97	6	●
5.6	57	97	6	●
5.7	57	97	6	●
5.8	57	97	6	●
5.9	57	97	6	●
6	57	97	6	●
6.1	66	106	8	●
6.2	66	106	8	●
6.3	66	106	8	●
6.4	66	106	8	●
6.5	66	106	8	●
6.6	66	106	8	●
6.7	66	106	8	●
6.8	66	106	8	●
6.9	66	106	8	●
7	66	106	8	●
7.1	76	116	8	●
7.2	76	116	8	●
7.3	76	116	8	●
7.4	76	116	8	●
7.5	76	116	8	●
7.6	76	116	8	●
7.7	76	116	8	●
7.8	76	116	8	●
7.9	76	116	8	●
8	76	116	8	●
8.1	95	139	10	●
8.2	95	139	10	●
8.3	95	139	10	●
8.4	95	139	10	●
8.5	95	139	10	●
8.6	95	139	10	●
8.7	95	139	10	●
8.8	95	139	10	●
8.9	95	139	10	●
9	95	139	10	●
9.1	95	139	10	●
9.2	95	139	10	●
9.3	95	139	10	●
9.4	95	139	10	●
9.5	95	139	10	●
9.6	95	139	10	●
9.7	95	139	10	●
9.8	95	139	10	●
9.9	95	139	10	●
10	95	139	10	●
10.2	114	163	12	●
10.5	114	163	12	●
10.8	114	163	12	●
11	114	163	12	●
11.5	114	163	12	●
12	114	163	12	●
12.5	133	182	14	●
13	133	182	14	●
13.5	133	182	14	●
14	133	182	14	●
14.5	152	204	16	●
15	152	204	16	●
15.5	152	204	16	●
16	152	204	16	●
16.5	171	223	18	●
17	171	223	18	●
17.5	171	223	18	●
18	171	223	18	●
18.5	190	244	20	●
19	190	244	20	●
19.5	190	244	20	●
20	190	244	20	●

Steel < 48HRC

P	H	M	K	N	S
●	●	●	●		○

UMG Carbide

AlTiCrN FT

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D437FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low~alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi~alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		80~150		80~150		80~150		40~70		32~50		50~80		80~150	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D437FT-3	3	13,000	0.09	13,000	0.09	13,000	0.09	6,400	0.09	5,300	0.07	6,300	0.09	13,000	0.09
D437FT-3.5	3.5	11,250	0.09	11,250	0.09	11,250	0.09	5,600	0.09	4,600	0.07	5,500	0.09	11,250	0.09
D437FT-4	4	9,500	0.10	9,500	0.10	9,500	0.10	4,800	0.10	4,000	0.08	4,700	0.10	9,500	0.10
D437FT-4.5	4.5	8,500	0.11	8,500	0.11	8,500	0.11	4,200	0.11	3,600	0.09	4,250	0.11	8,500	0.11
D437FT-5	5	7,600	0.12	7,600	0.12	7,600	0.12	3,800	0.12	3,200	0.10	3,800	0.12	7,600	0.12
D437FT-5.5	5.5	7,000	0.13	7,000	0.13	7,000	0.13	3,500	0.13	2,920	0.11	3,500	0.13	7,000	0.13
D437FT-6	6	6,400	0.14	6,400	0.14	6,400	0.14	3,200	0.14	2,650	0.12	3,200	0.14	6,400	0.14
D437FT-6.5	6.5	6,000	0.14	6,000	0.14	6,000	0.14	3,000	0.15	2,480	0.12	3,000	0.15	6,000	0.14
D437FT-7	7	5,600	0.15	5,600	0.15	5,600	0.15	2,800	0.15	2,320	0.13	2,800	0.15	5,600	0.15
D437FT-7.5	7.5	5,200	0.15	5,200	0.15	5,200	0.15	2,600	0.15	2,160	0.13	2,600	0.15	5,200	0.15
D437FT-8	8	4,800	0.16	4,800	0.16	4,800	0.16	2,400	0.16	2,000	0.14	2,400	0.16	4,800	0.16
D437FT-8.5	8.5	4,550	0.16	4,550	0.16	4,550	0.16	2,275	0.16	1,900	0.14	2,275	0.16	4,550	0.16
D437FT-9	9	4,300	0.17	4,300	0.17	4,300	0.17	2,150	0.17	1,800	0.14	2,150	0.17	4,300	0.17
D437FT-9.5	9.5	4,050	0.17	4,050	0.17	4,050	0.17	2,025	0.17	1,700	0.14	2,025	0.17	4,050	0.17
D437FT-10	10	3,800	0.18	3,800	0.18	3,800	0.18	1,900	0.18	1,600	0.15	1,900	0.18	3,800	0.18
D437FT-10.5	10.5	3,650	0.18	3,650	0.18	3,650	0.18	1,825	0.18	1,525	0.15	1,825	0.18	3,650	0.18
D437FT-11	11	3,500	0.19	3,500	0.19	3,500	0.19	1,750	0.19	1,450	0.16	1,750	0.19	3,500	0.19
D437FT-11.5	11.5	3,350	0.19	3,350	0.19	3,350	0.19	1,675	0.19	1,375	0.16	1,675	0.19	3,350	0.19
D437FT-12	12	3,200	0.20	3,200	0.20	3,200	0.20	1,600	0.20	1,300	0.17	1,600	0.20	3,200	0.20
D437FT-12.5	12.5	3,075	0.20	3,075	0.20	3,075	0.20	1,535	0.20	1,275	0.17	1,530	0.20	3,075	0.20
D437FT-13	13	2,950	0.21	2,950	0.21	2,950	0.21	1,475	0.21	1,250	0.17	1,475	0.21	2,950	0.21
D437FT-13.5	13.5	2,825	0.21	2,825	0.21	2,825	0.21	1,410	0.21	1,225	0.17	1,410	0.21	2,825	0.21
D437FT-14	14	2,700	0.22	2,700	0.22	2,700	0.22	1,350	0.22	1,200	0.18	1,350	0.22	2,700	0.22
D437FT-14.5	14.5	2,625	0.23	2,625	0.23	2,625	0.23	1,310	0.23	1,150	0.18	1,310	0.23	2,625	0.23
D437FT-15	15	2,550	0.24	2,550	0.24	2,550	0.24	1,275	0.24	1,100	0.19	1,275	0.24	2,550	0.24
D437FT-15.5	15.5	2,475	0.24	2,475	0.24	2,475	0.24	1,230	0.24	1,050	0.19	1,235	0.24	2,475	0.24
D437FT-16	16	2,400	0.25	2,400	0.25	2,400	0.25	1,200	0.25	1,000	0.20	1,200	0.25	2,400	0.25
D437FT-16.5	16.5	2,325	0.26	2,325	0.26	2,325	0.26	1,175	0.26	975	0.20	1,175	0.26	2,325	0.26
D437FT-17	17	2,250	0.27	2,250	0.27	2,250	0.27	1,150	0.27	950	0.21	1,150	0.27	2,250	0.27
D437FT-17.5	17.5	2,175	0.27	2,175	0.27	2,175	0.27	1,125	0.27	925	0.22	1,125	0.27	2,175	0.27
D437FT-18	18	2,100	0.28	2,100	0.28	2,100	0.28	1,100	0.28	900	0.23	1,100	0.28	2,100	0.28
D437FT-18.5	18.5	2,050	0.28	2,050	0.28	2,050	0.28	1,075	0.28	875	0.23	1,065	0.28	2,050	0.28
D437FT-19	19	2,000	0.29	2,000	0.29	2,000	0.29	1,050	0.29	850	0.24	1,025	0.29	2,000	0.29
D437FT-19.5	19.5	1,950	0.29	1,950	0.29	1,950	0.29	1,025	0.29	825	0.24	980	0.29	1,950	0.29
D437FT-20	20	1,900	0.30	1,900	0.30	1,900	0.30	1,000	0.30	800	0.25	950	0.30	1,900	0.30

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D441FT / D442FT / D443FT 極超微粒鎢鋼塗層內冷高速鑽頭

Oil-Feed High Performance Drills

Code No. D441FT-Dc

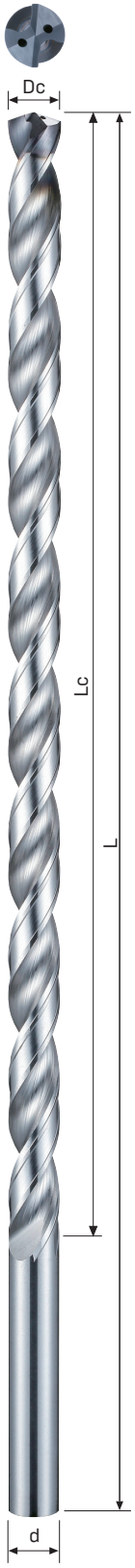
Dc m7	Lc mm	L mm	d h6	12XD D441FT
3	54	92	6	●
3.5	54	92	6	●
4	64	102	6	●
4.5	64	102	6	●
5	83	121	6	●
5.5	83	121	6	●
6	83	121	6	●
6.5	110	148	8	●
7	110	148	8	●
8	110	148	8	●
8.5	138	180	10	●
9	138	180	10	●
10	138	180	10	●
11	158	206	12	●
12	158	206	12	●

Code No. D442FT-Dc

Dc m7	Lc mm	L mm	d h6	16XD D442FT
3	57	100	6	●
3.5	78	120	6	●
4	78	120	6	●
4.5	100	140	6	●
5	100	140	6	●
5.5	110	150	6	●
6	120	160	6	●
6.5	135	175	8	●
7	135	175	8	●
8	152	192	8	●
8.5	162	206	10	●
9	162	206	10	●
10	180	224	10	●
11	198	247	12	●
12	216	265	12	●

Code No. D443FT-Dc

Dc m7	Lc mm	L mm	d h6	20XD D443FT
3	65	107	6	●
3.5	92	134	6	●
4	92	134	6	●
4.5	118	158	6	●
5	118	158	6	●
5.5	132	170	6	●
6	144	182	6	●
6.5	162	200	8	●
7	162	200	8	●
8	184	222	8	●
8.5	198	240	10	●
9	198	240	10	●
10	220	262	10	●
11	242	289	12	●
12	264	311	12	●



Steel < 52HRC

P	H	M	K	N	S
●	●	●	●		○

UMG Carbide

AlTiCrN FT

12XD
16XD
20XD

2

138°

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

D441FT / D442FT / D443FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~125		60~125		60~125		40~80		40~80		50~80	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D441FT/D442FT/D443FT-3	3	7,500	0.06	7,500	0.06	7,500	0.06	5,300	0.06	5,300	0.06	7,500	0.06
D441FT/D442FT/D443FT-3.5	3.5	6,850	0.07	6,850	0.07	6,850	0.07	5,150	0.07	5,150	0.07	6,500	0.07
D441FT/D442FT/D443FT-4	4	6,400	0.08	6,400	0.08	6,400	0.08	5,000	0.08	5,000	0.08	5,600	0.08
D441FT/D442FT/D443FT-4.5	4.5	6,100	0.09	6,100	0.09	6,100	0.09	4,750	0.09	4,750	0.09	5,050	0.09
D441FT/D442FT/D443FT-5	5	5,800	0.10	5,800	0.10	5,800	0.10	4,500	0.10	4,500	0.10	4,500	0.10
D441FT/D442FT/D443FT-5.5	5.5	5,300	0.11	5,300	0.11	5,300	0.11	4,150	0.11	4,150	0.11	4,150	11.00
D441FT/D442FT/D443FT-6	6	4,800	0.12	4,800	0.12	4,800	0.12	3,800	0.12	3,800	0.12	3,800	0.12
D441FT/D442FT/D443FT-6.5	6.5	4,500	0.13	4,500	0.13	4,500	0.13	3,550	0.13	3,550	0.13	3,550	0.13
D441FT/D442FT/D443FT-7	7	4,200	0.14	4,200	0.14	4,200	0.14	3,300	0.14	3,300	0.14	3,300	0.14
D441FT/D442FT/D443FT-8	8	3,600	0.16	3,600	0.16	3,600	0.16	2,800	0.16	2,800	0.16	2,800	0.16
D441FT/D442FT/D443FT-8.5	8.5	3,430	0.17	3,430	0.17	3,430	0.17	2,675	0.17	2,675	0.17	2,675	0.17
D441FT/D442FT/D443FT-9	9	3,250	0.18	3,250	0.18	3,250	0.18	2,550	0.18	2,550	0.18	2,550	0.18
D441FT/D442FT/D443FT-10	10	2,900	0.20	2,900	0.20	2,900	0.20	2,300	0.20	2,300	0.20	2,300	0.20
D441FT/D442FT/D443FT-11	11	2,650	0.22	2,650	0.22	2,650	0.22	2,100	0.22	2,100	0.22	2,100	0.22
D441FT/D442FT/D443FT-12	12	2,400	0.24	2,400	0.24	2,400	0.24	1,900	0.24	1,900	0.24	1,900	0.24

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

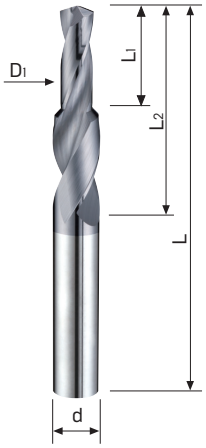
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

D419FT 極超微粒鎢鋼塗層內冷高速鑽頭

Combined Drill and Chamfer Tool

Code No. D419FT-thread

For thread size	D1 mm	L1 mm	L2 mm	L mm	d h6	AlTiCrN D419FT
M 3	2.5	8.8	28	66	6	●
M 4	3.3	11.4	28	66	6	●
M 5	4.2	13.6	28	66	6	●
M 6	5	16.5	41	79	8	●
M 8	6.8	21	47	89	10	●
M10	8.5	25.5	55	102	12	●
M12	10.2	30	60	107	14	●

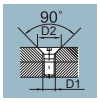


Steel < 48HRC

P	H	M	K	N	S
●	●	○	●	○	

UMG Carbide

AlTiCrN FT



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	○
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

D419FT 切削條件參考表

Recommended Milling Conditions

Borehole parameters 鑽孔參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel (~24HRC)		GR.3 高合金鋼 Hi-alloyed Steel (~30HRC)		GR.4 硬化鋼 Hardened Steel (30~38HRC)		GR.5 硬化鋼 Hardened Steel (38~48HRC)		GR.9 鑄鐵 Cast Iron	
切削速度 Vc m/min		60~100		60~100		60~100		40~65		30~45		60~100	
型號 Code No.	刃徑 Dc	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)	RPM 迴轉速度 (min-1)	Feed 進給速度 (mm/rev)
D419FT-M3	2.5	10,200	0.06	10,200	0.06	10,200	0.06	5,100	0.06	5,100	0.05	10,200	0.06
D419FT-M4	3.3	7,720	0.08	7,720	0.08	7,720	0.08	3,860	0.08	3,860	0.07	7,720	0.08
D419FT-M5	4.2	6,060	0.1	6,060	0.1	6,060	0.1	3,030	0.1	3,030	0.09	6,060	0.1
D419FT-M6	5	5,000	0.12	5,000	0.12	5,000	0.12	3,000	0.12	3,000	0.12	5,000	0.12
D419FT-M8	6.8	3,700	0.15	3,700	0.15	3,700	0.15	2,250	0.15	2,250	0.15	3,700	0.15
D419FT-M10	8.5	3,050	0.160	3,050	0.160	3,050	0.160	1,825	0.16	1,825	0.16	3,050	0.160
D419FT-M12	10.2	2,550	0.18	2,550	0.18	2,550	0.18	1,600	0.18	1,600	0.18	2,550	0.18

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

鉸刀
Reamers

Page	317	319	321	323	325	327
Apperance						
Code No	R300	R301	R302	R303	R308	R309
Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide	MG Carbide
Coating	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank	Uncoated Blank
Helix Angle	0°	7°	7°	7°	7°	7°
No.of Flutes	Z	Z	Z	Z	Z	Z

歐規
DIN

7leaders®
The Art of Cutting

329

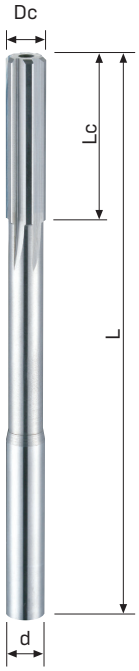
R329						
MG Carbide						
Uncoated Blank						
 30°						
 Z						

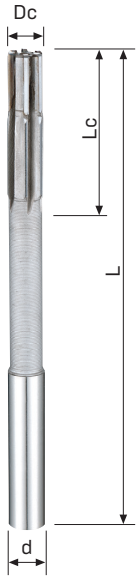
Code No. R300-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R300
3	15	61	3	4	●
3.5	18	70	3.5	4	●
4	19	75	4	4	●
4.5	21	80	4.5	4	●
5	23	86	5	6	●
6	26	93	6	6	●
7	31	109	7	6	●
8	33	117	8	6	●
9	36	125	9	6	●
10	38	133	10	6	●
11	41	142	10	6	●
12	44	151	10	6	●
13	44	151	10	6	●
14	47	160	12.5	6	●
15	50	162	12.5	6	●
16	52	170	12.5	6	●
18	56	182	14.0	6	●
20	60	195	16.0	6	●

※ 3-9.5 Solid Carbide
※ 10.0-20.0 Carbide Tipped

※ 3-9.5 全鎢鋼
※10.0-20.0 焊刃鎢鋼



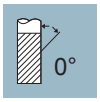


Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank



Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Universal reamer cutting parameters　通用鉸刀切削參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）
R300-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.008~0.015	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R300-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R300-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R300-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R300-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R300-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R300-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2
R300-14	14	0.09~0.18	0.1~0.2	0.1~0.18	0.1~0.2	0.08~0.15	0.1~0.2	0.07~0.15	0.1~0.2	0.04~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.1~0.18	0.05~0.1	0.08~0.2	0.1~0.2	0.08~0.15	0.1~0.2
R300-16	16	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.08~0.18	0.1~0.2	0.04~0.08	0.03~0.08	0.1~0.2	0.1~0.2	0.1~0.2	0.05~0.1	0.1~0.22	0.1~0.2	0.1~0.2	0.1~0.2
R300-18	18	0.12~0.18	0.1~0.2	0.12~0.2	0.1~0.2	0.11~0.21	0.1~0.2	0.1~0.18	0.1~0.2	0.04~0.09	0.03~0.08	0.11~0.21	0.1~0.2	0.12~0.2	0.05~0.1	0.12~0.27	0.1~0.2	0.1~0.21	0.1~0.2
R300-20	20	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2

※ Please note that regarding to cutting speed of carbide tipped, please refer to this parameter. You should adjust feed and finishing allowance according to the pratical cutting situation.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意焊刃式鉸刀切削速度可參照此參數表，進給速度和切削餘量請依實際切削狀況作調整。

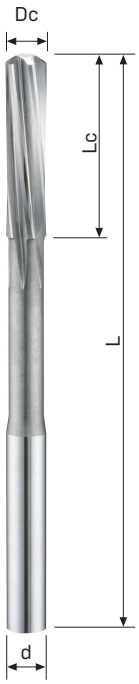
1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

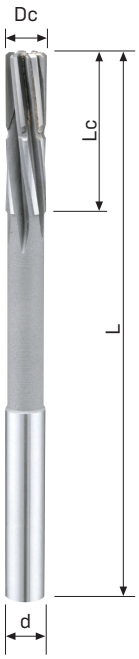
Code No. R301-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R301
3	15	61	3	4	●
3.5	18	70	3.5	4	●
4	19	75	4	4	●
4.5	21	80	4.5	4	●
5	23	86	5	6	●
5.5	26	93	5.5	6	●
6	26	93	6	6	●
6.5	28	101	6.5	6	●
7	31	109	7	6	●
7.5	31	109	7.5	6	●
8	33	117	8	6	●
8.5	33	117	8.5	6	●
9	36	125	9	6	●
9.5	36	125	9.5	6	●
10	38	133	10	6	●
10.5	38	133	10	6	●
11	41	142	10	6	●
11.5	41	142	10	6	●
12	44	151	10	6	●
12.5	44	151	10	6	●
13	44	151	10	6	●
13.5	47	160	12.5	6	●
14	47	160	12.5	6	●
14.5	50	162	12.5	6	●
15	50	162	12.5	6	●
15.5	52	170	12.5	6	●
16	52	170	12.5	6	●
17	54	175	14	6	●
18	56	182	14	6	●
19	58	189	16	6	●
20	60	195	16	6	●

※ 3-9.5 Solid Carbide
※ 10.0-20.0 Carbide Tipped

※ 3-9.5 全鎢鋼
※10.0-20.0 焊刃鎢鋼





Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Universal reamer cutting parameters 通用鉸刀切削參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel（~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel（~30HRC）		GR.4 硬化鋼 Hardened Steel（30~38HRC）		GR.5 硬化鋼 Hardened Steel（38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量（mm）
R301-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.008~0.015	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R301-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R301-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R301-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R301-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R301-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R301-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2
R301-14	14	0.09~0.18	0.1~0.2	0.1~0.18	0.1~0.2	0.08~0.15	0.1~0.2	0.07~0.15	0.1~0.2	0.04~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.1~0.18	0.05~0.1	0.08~0.2	0.1~0.2	0.08~0.15	0.1~0.2
R301-16	16	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.08~0.18	0.1~0.2	0.04~0.08	0.03~0.08	0.1~0.2	0.1~0.2	0.1~0.2	0.05~0.1	0.1~0.22	0.1~0.2	0.1~0.2	0.1~0.2
R301-18	18	0.12~0.18	0.1~0.2	0.12~0.2	0.1~0.2	0.11~0.21	0.1~0.2	0.1~0.18	0.1~0.2	0.04~0.09	0.03~0.08	0.11~0.21	0.1~0.2	0.12~0.2	0.05~0.1	0.12~0.27	0.1~0.2	0.1~0.21	0.1~0.2
R301-20	20	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

R302 超微粒鎢鋼長柄機械鉸刀

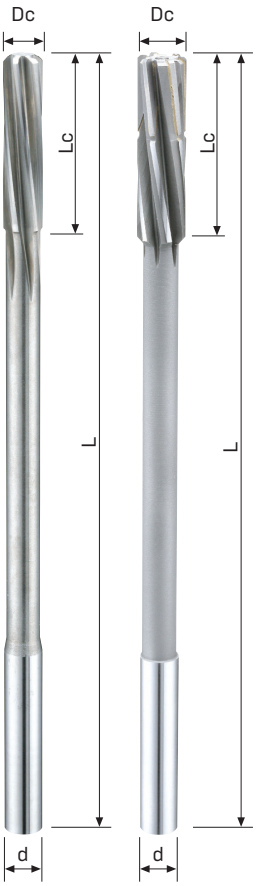
Machine Reamers Long Length

Code No. R302-Dc

Dc H7	Lc mm	L mm	d mm	Z teeth	Blank R302
3	15	100	3	4	●
3.5	18	112	3.5	4	●
4	19	119	4	4	●
4.5	21	126	4.5	4	●
5	23	132	5	6	●
6	26	139	6	6	●
7	31	156	7	6	●
8	33	165	8	6	●
9	36	175	9	6	●
10	38	184	10	6	●
11	41	195	10	6	●
12	44	205	10	6	●
13	44	205	10	6	●
14	47	214	12.5	6	●
15	50	220	12.5	6	●
16	52	227	12.5	6	●
17	54	235	14	6	●
18	56	241	14	6	●
19	58	247	16	6	●
20	60	254	16	6	●

※ 3-9.0 Solid Carbide
※ 10.0-20.0 Carbide Tipped

※ 3-9.0 全鎢鋼
※10.0-20.0 焊刃鎢鋼



Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

R302 切削條件參考表

Recommended Milling Conditions

General center drill parameters　通用中心鑽參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）
R302-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.008~0.015	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R302-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R302-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R302-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R302-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R302-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R302-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2
R302-14	14	0.09~0.18	0.1~0.2	0.1~0.18	0.1~0.2	0.08~0.15	0.1~0.2	0.07~0.15	0.1~0.2	0.04~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.1~0.18	0.05~0.1	0.08~0.2	0.1~0.2	0.08~0.15	0.1~0.2
R302-16	16	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.08~0.18	0.1~0.2	0.04~0.08	0.03~0.08	0.1~0.2	0.1~0.2	0.1~0.2	0.05~0.1	0.1~0.22	0.1~0.2	0.1~0.2	0.1~0.2
R302-18	18	0.12~0.18	0.1~0.2	0.12~0.2	0.1~0.2	0.11~0.21	0.1~0.2	0.1~0.18	0.1~0.2	0.04~0.09	0.03~0.08	0.11~0.21	0.1~0.2	0.12~0.2	0.05~0.1	0.12~0.27	0.1~0.2	0.1~0.21	0.1~0.2
R302-20	20	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

R303 超微粒鎢鋼斜柄機械鉸刀

Machine Reamers Carbide Tipped

Code No. R303-Dc

Dc H7	Lc mm	L mm	d M.T.	Z teeth	Blank R303
10	38	168	1	6	●
11	41	175	1	6	●
12	44	182	1	6	●
13	44	182	1	6	●
14	47	189	1	6	●
15	50	204	2	6	●
16	52	210	2	6	●
17	54	214	2	6	●
18	56	219	2	6	●
19	58	223	2	6	●
20	60	228	2	6	●
22	64	237	2	6	●
24	68	268	3	8	●
25	68	268	3	8	●
26	70	273	3	8	●
28	71	277	3	8	●
30	73	281	3	8	●
32	77	317	4	8	●
35	78	321	4	8	●
36	79	325	4	8	●
38	81	329	4	8	●
40	81	329	4	8	●

Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

R303 切削條件參考表

Universal reamer cutting parameters　通用鉸刀切削參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）
R303-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R303-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2
R303-14	14	0.09~0.18	0.1~0.2	0.1~0.18	0.1~0.2	0.08~0.15	0.1~0.2	0.07~0.15	0.1~0.2	0.04~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.1~0.18	0.05~0.1	0.08~0.2	0.1~0.2	0.08~0.15	0.1~0.2
R303-16	16	0.1v0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.1~0.2	0.08~0.18	0.1~0.2	0.04~0.08	0.03~0.08	0.1~0.2	0.1~0.2	0.1~0.2	0.05~0.1	0.1~0.22	0.1~0.2	0.1~0.2	0.1~0.2
R303-18	18	0.12~0.18	0.1~0.2	0.12~0.2	0.1~0.2	0.11~0.21	0.1~0.2	0.1~0.18	0.1~0.2	0.04~0.09	0.03~0.08	0.11~0.21	0.1~0.2	0.12~0.2	0.05~0.1	0.12~0.27	0.1~0.2	0.1~0.21	0.1~0.2
R303-20	20	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-22	22	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-24	24	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-26	26	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.12~0.20	0.1~0.2	0.1~0.22	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-28	28	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-30	30	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-32	32	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-35	35	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.12~0.22	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-36	36	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-38	38	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2
R303-40	40	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.15~0.25	0.1~0.2	0.1~0.2	0.1~0.2	0.04~0.09	0.03~0.08	0.12~0.22	0.1~0.2	0.12~0.23	0.05~0.1	0.13~0.3	0.1~0.2	0.12~0.23	0.1~0.2

※ Please note that regarding to cutting speed of carbide tipped, please refer to this parameter. You should adjust feed and finishing allowance according to the pratical cutting situation.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意焊刃式鉸刀切削速度可參照此參數表，進給速度和切削餘量請依實際切削狀況作調整。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

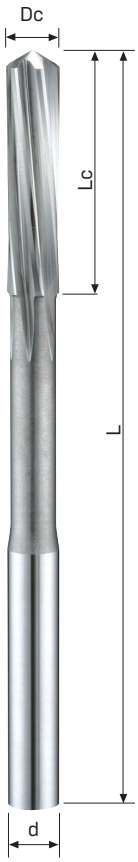
R308 超微粒鎢鋼機械鉸刀，每0.1mm-尺寸

Machine Reamers In Steps of 0.1mm

Code No. R308-Dc

Dc H7	Lc mm	L mm	Z teeth	Blank R308
1	6	34	4	●
1.1	7	36	4	●
1.2	7	38	4	●
1.3	7	38	4	●
1.4	8	40	4	●
1.5	8	40	4	●
1.6	9	43	4	●
1.7	9	43	4	●
1.8	10	46	4	●
1.9	10	46	4	●
2	11	49	4	●
2.1	11	49	4	●
2.2	12	53	4	●
2.3	12	53	4	●
2.4	14	57	4	●
2.5	14	57	4	●
2.6	14	57	4	●
2.7	15	61	4	●
2.8	15	61	4	●
2.9	15	61	4	●
3	15	61	4	●
3.1	16	65	4	●
3.2	16	65	4	●
3.3	16	65	4	●
3.4	18	70	4	●
3.5	18	70	4	●
3.6	18	70	4	●
3.7	18	70	4	●
3.8	19	75	4	●
3.9	19	75	4	●
4	19	75	4	●
4.1	19	75	4	●
4.2	19	75	4	●
4.3	21	80	4	●
4.4	21	80	4	●
4.5	21	80	4	●
4.6	21	80	6	●
4.7	21	80	6	●
4.8	23	86	6	●
4.9	23	86	6	●
5	23	86	6	●
5.1	23	86	6	●
5.2	23	86	6	●
5.3	23	86	6	●
5.4	26	93	6	●
5.5	26	93	6	●
5.6	26	93	6	●
5.7	26	93	6	●
5.8	26	93	6	●
5.9	26	93	6	●
6	26	93	6	●
6.1	28	101	6	●
6.2	28	101	6	●
6.3	28	101	6	●
6.4	28	101	6	●
6.5	28	101	6	●
6.6	28	101	6	●
6.7	31	101	6	●
6.8	31	109	6	●
6.9	31	109	6	●
7	31	109	6	●
7.1	31	109	6	●
7.2	31	109	6	●
7.3	31	109	6	●
7.4	31	109	6	●
7.5	31	109	6	●
7.6	33	117	6	●
7.7	33	117	6	●
7.8	33	117	6	●
7.9	33	117	6	●
8	33	117	6	●
8.1	33	117	6	●
8.2	33	117	6	●
8.3	33	117	6	●
8.4	33	117	6	●
8.5	33	117	6	●
8.6	36	125	6	●
8.7	36	125	6	●
8.8	36	125	6	●
8.9	36	125	6	●
9	36	125	6	●
9.1	36	125	6	●
9.2	36	125	6	●
9.3	36	125	6	●
9.4	36	125	6	●
9.5	36	125	6	●
9.6	38	133	6	●
9.7	38	133	6	●
9.8	38	133	6	●
9.9	38	133	6	●
10	38	133	6	●
10.1	38	133	6	●
10.2	38	133	6	●
10.3	38	133	6	●
10.4	38	133	6	●
10.5	38	133	6	●
10.6	38	133	6	●
10.7	41	142	6	●
10.8	41	142	6	●
10.9	41	142	6	●
11	41	142	6	●
11.1	41	142	6	●
11.2	41	142	6	●
11.3	41	142	6	●
11.4	41	142	6	●
11.5	41	142	6	●
11.6	41	142	6	●
11.7	41	142	6	●
11.8	41	142	6	●
11.9	44	151	6	●
12	44	151	6	●

※Dc=d



Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

R308 切削條件參考表

General center drill parameters　通用中心鑽參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 （mm）
R308-1	1	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.1	0.008~0.015	0.03~0.1	0.01~0.02	0.03~0.1	0.008~0.015	0.05~0.1	0.015~0.03	0.1~0.2	0.015~0.03	0.05~0.15
R308-1.5	1.5	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.01~0.02	0.03~0.1	0.008~0.015	0.03~0.1	0.01~0.02	0.03~0.1	0.008~0.015	0.05~0.1	0.015~0.03	0.1~0.2	0.015~0.03	0.05~0.15
R308-2	2	0.015~0.025	0.03~0.12	0.015~0.025	0.03~0.12	0.015~0.025	0.03~0.12	0.012~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.012~0.02	0.03~0.12	0.01~0.03	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R308-2.5	2.5	0.015~0.025	0.03~0.12	0.015~0.025	0.03~0.12	0.015~0.025	0.03~0.12	0.012~0.02	0.03~0.12	0.01~0.02	0.03~0.12	0.012~0.02	0.03~0.12	0.01~0.03	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R308-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.028~0.045	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R308-3.5	3.5	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.028~0.045	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R308-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R308-4.5	4.5	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R308-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R308-5.5	5.5	0.04~0.6	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	0.028~0.045	0.1~0.2	0.04~0.06	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R308-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R308-6.5	6.5	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.04~0.08	0.1~0.2	0.02~0.05	0.03~0.08	0.05~0.09	0.1~0.2	0.05~0.09	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R308-7	7	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R308-7.5	7.5	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.05~0.09	0.1~0.2	0.04~0.08	0.1~0.2	0.02~0.05	0.03~0.08	0.05~0.09	0.1~0.2	0.05~0.09	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R308-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R308-8.5	8.5	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R308-9	9	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R308-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R308-11	11	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R308-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2

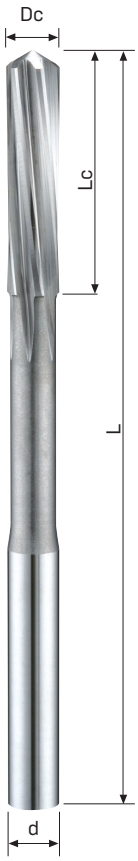
1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

Code No. R309-Dc

Dc +0.003 -0	Lc mm	L mm	d h6	Z teeth	Blank R309
2.95	15	61	3	4	●
2.96	15	61	3	4	●
2.97	15	61	3	4	●
2.98	15	61	3	4	●
2.99	15	61	3	4	●
3	15	61	3	4	●
3.01	15	61	3	4	●
3.02	15	61	3	4	●
3.03	15	61	3	4	●
3.04	15	61	3	4	●
3.05	15	61	3	4	●
3.95	19	75	4	4	●
3.96	19	75	4	4	●
3.97	19	75	4	4	●
3.98	19	75	4	4	●
3.99	19	75	4	4	●
4	19	75	4	4	●
4.01	19	75	4	4	●
4.02	19	75	4	4	●
4.03	19	75	4	4	●
4.04	19	75	4	4	●
4.05	19	75	4	4	●
4.95	23	86	5	6	●
4.96	23	86	5	6	●
4.97	23	86	5	6	●
4.98	23	86	5	6	●
4.99	23	86	5	6	●
5	23	86	5	6	●
5.01	23	86	5	6	●
5.02	23	86	5	6	●
5.03	23	86	5	6	●
5.04	23	86	5	6	●
5.05	23	86	5	6	●
5.95	26	93	6	6	●
5.96	26	93	6	6	●
5.97	26	93	6	6	●
5.98	26	93	6	6	●
5.99	26	93	6	6	●
6	26	93	6	6	●
6.01	26	93	6	6	●
6.02	26	93	6	6	●
6.03	26	93	6	6	●
6.04	26	93	6	6	●
6.05	26	93	6	6	●
6.95	31	109	7	6	●
6.96	31	109	7	6	●
6.97	31	109	7	6	●
6.98	31	109	7	6	●
6.99	31	109	7	6	●
7	31	109	7	6	●
7.01	31	109	7	6	●
7.02	31	109	7	6	●
7.03	31	109	7	6	●
7.04	31	109	7	6	●
7.05	31	109	7	6	●
7.95	33	117	8	6	●
7.96	33	117	8	6	●
7.97	33	117	8	6	●
7.98	33	117	8	6	●
7.99	33	117	8	6	●

Dc +0.003 -0	Lc mm	L mm	d h6	Z teeth	Blank R309
8	33	117	8	6	●
8.01	33	117	8	6	●
8.02	33	117	8	6	●
8.03	33	117	8	6	●
8.04	33	117	8	6	●
8.05	33	117	8	6	●
8.95	36	125	9	6	●
8.96	36	125	9	6	●
8.97	36	125	9	6	●
8.98	36	125	9	6	●
8.99	36	125	9	6	●
9	36	125	9	6	●
9.01	36	125	9	6	●
9.02	36	125	9	6	●
9.03	36	125	9	6	●
9.04	36	125	9	6	●
9.05	36	125	9	6	●
9.95	38	133	10	6	●
9.96	38	133	10	6	●
9.97	38	133	10	6	●
9.98	38	133	10	6	●
9.99	38	133	10	6	●
10	38	133	10	6	●
10.01	38	133	10	6	●
10.02	38	133	10	6	●
10.03	38	133	10	6	●
10.04	38	133	10	6	●
10.05	38	133	10	6	●
11.95	44	151	12	6	●
11.96	44	151	12	6	●
11.97	44	151	12	6	●
11.98	44	151	12	6	●
11.99	44	151	12	6	●
12	44	151	12	6	●
12.01	44	151	12	6	●
12.02	44	151	12	6	●
12.03	44	151	12	6	●
12.04	44	151	12	6	●
12.05	44	151	12	6	●



Steel < 56HRC

P	H	M	K	N	S
●	●		●	○	

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Universal reamer cutting parameters　通用鉸刀切削參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel（~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel（~30HRC）		GR.4 硬化鋼 Hardened Steel（30~38HRC）		GR.5 硬化鋼 Hardened Steel（38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)
R309-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.028~0.045	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R309-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R309-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R309-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R309-7	7	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R309-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R309-9	9	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R309-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R309-11	11	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R309-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2

※ Please note that regarding to cutting speed of carbide tipped, please refer to this parameter. You should adjust feed and finishing allowance according to the pratical cutting situation.

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

※注意焊刃式鉸刀切削速度可參照此參數表，進給速度和切削餘量請依實際切削狀況作調整。

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。

R329 超微粒鎢鋼右螺旋NC機械鉸刀(附底刃)

NC Machine Reamers Right Hand Helix (End Cutting)

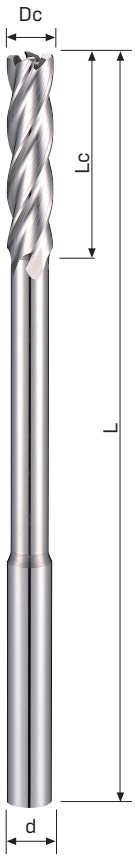
Code No. R329-Dc

Dc +0.003 -0	Lc mm	L mm	d h6	Z teeth	Blank R329
2.95	15	61	3	4	●
2.96	15	61	3	4	●
2.97	15	61	3	4	●
2.98	15	61	3	4	●
2.99	15	61	3	4	●
3	15	61	3	4	●
3.01	15	61	3	4	●
3.02	15	61	3	4	●
3.03	15	61	3	4	●
3.04	15	61	3	4	●
3.05	15	61	3	4	●
3.95	19	75	4	4	●
3.96	19	75	4	4	●
3.97	19	75	4	4	●
3.98	19	75	4	4	●
3.99	19	75	4	4	●
4	19	75	4	4	●
4.01	19	75	4	4	●
4.02	19	75	4	4	●
4.03	19	75	4	4	●
4.04	19	75	4	4	●
4.05	19	75	4	4	●
4.95	23	86	5	4	●
4.96	23	86	5	4	●
4.97	23	86	5	4	●
4.98	23	86	5	4	●
4.99	23	86	5	4	●
5	23	86	5	4	●
5.01	23	86	5	4	●
5.02	23	86	5	4	●
5.03	23	86	5	4	●
5.04	23	86	5	4	●
5.05	23	86	5	4	●
5.95	26	93	6	4	●
5.96	26	93	6	4	●
5.97	26	93	6	4	●
5.98	26	93	6	4	●
5.99	26	93	6	4	●
6	26	93	6	4	●
6.01	26	93	6	4	●
6.02	26	93	6	4	●
6.03	26	93	6	4	●
6.04	26	93	6	4	●
6.05	26	93	6	4	●
6.95	31	109	8	4	●
6.96	31	109	7	4	●
6.97	31	109	7	4	●
6.98	31	109	7	4	●
6.99	31	109	7	4	●
7	31	109	7	4	●
7.01	31	109	7	4	●
7.02	31	109	7	4	●
7.03	31	109	7	4	●
7.04	31	109	7	4	●
7.05	31	109	7	4	●
7.95	33	117	7	4	●
7.96	33	117	8	4	●
7.97	33	117	8	4	●
7.98	33	117	8	4	●
7.99	33	117	8	4	●

Dc +0.003 -0	Lc mm	L mm	d h6	Z teeth	Blank R329
8	33	117	8	4	●
8.01	33	117	8	4	●
8.02	33	117	8	4	●
8.03	33	117	8	4	●
8.04	33	117	8	4	●
8.05	33	117	8	4	●
8.95	36	125	9	4	●
8.96	36	125	9	4	●
8.97	36	125	9	4	●
8.98	36	125	9	4	●
8.99	36	125	9	4	●
9	36	125	9	4	●
9.01	36	125	9	4	●
9.02	36	125	9	4	●
9.03	36	125	9	4	●
9.04	36	125	9	4	●
9.05	36	125	9	4	●
9.95	38	133	10	4	●
9.96	38	133	10	4	●
9.97	38	133	10	4	●
9.98	38	133	10	4	●
9.99	38	133	10	4	●
10	38	133	10	4	●
10.01	38	133	10	4	●
10.02	38	133	10	4	●
10.03	38	133	10	4	●
10.04	38	133	10	4	●
10.05	38	133	10	4	●
11.95	44	151	12	4	●
11.96	44	151	12	4	●
11.97	44	151	12	4	●
11.98	44	151	12	4	●
11.99	44	151	12	4	●
12	44	151	12	4	●
12.01	44	151	12	4	●
12.02	44	151	12	4	●
12.03	44	151	12	4	●
12.04	44	151	12	4	●
12.05	44	151	12	4	●

※ The Reamers with internal coolant for stop holes The bottom can be perfectly processed.

※ 盲孔用帶內冷可加工底部達到精緻面。



Steel < 56HRC

P	H	M	K	N	S
●	●	●	●	○	○

MG Carbide

Uncoated Blank

Work Material

P	GR1	碳鋼 Carbon Steel	●
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	●
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	●
H	GR4	硬化鋼 30~38HRC Hardened Steel	●
	GR5	硬化鋼 38~48HRC Hardened Steel	●
	GR6	硬化鋼 48~56HRC Hardened Steel	○
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	●
K	GR9	鑄鐵 Cast Iron	●
N	GR10	鋁 Aluminium	○
	GR11	銅 Copper	○
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	○
	GR16	鎳 Nickel	○
	GR17	耐熱鋼 Heat-resistant Steel	○

R329 切削條件參考表

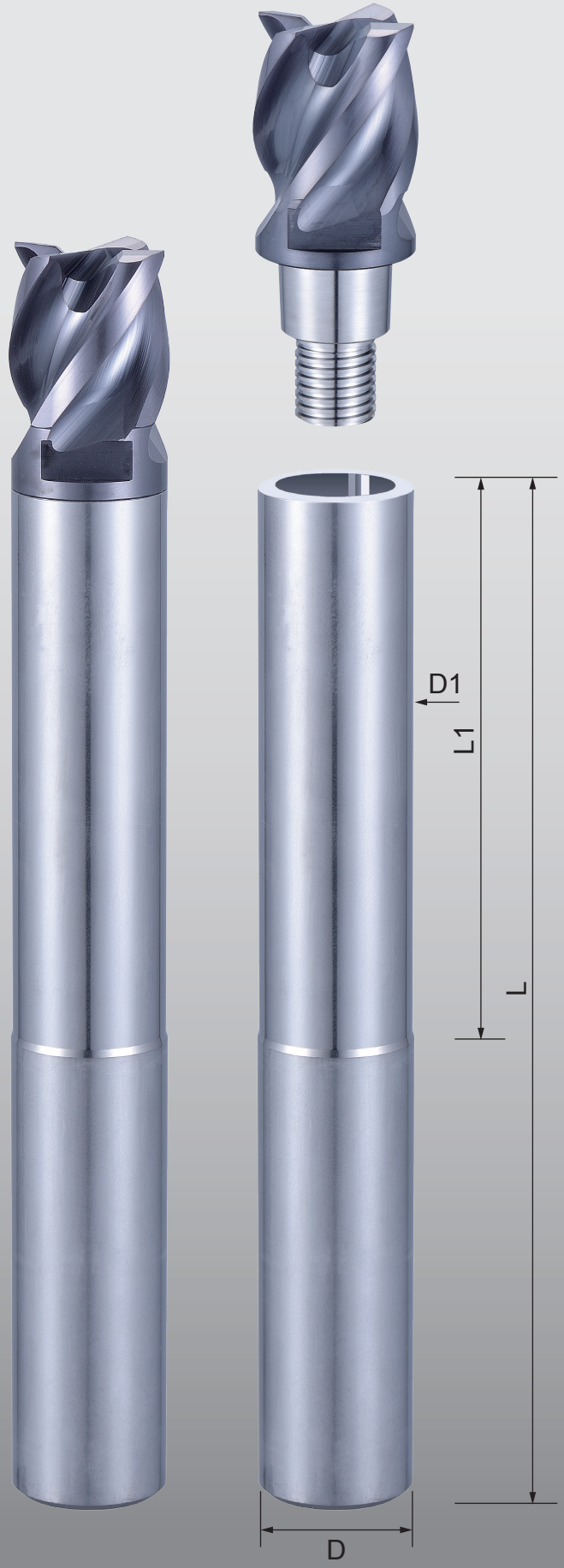
Recommended Milling Conditions

Universal reamer cutting parameters 通用鉸刀切削參數

被削材 Work Material		GR.1 碳鋼 Carbon Steel		GR.2 低合金鋼 Low-alloyed Steel （~24HRC）		GR.3 高合金鋼 Hi-alloyed Steel （~30HRC）		GR.4 硬化鋼 Hardened Steel （30~38HRC）		GR.5 硬化鋼 Hardened Steel （38~48HRC）		GR.8 不鏽鋼 Stainless Steel		GR.9 鑄鐵 Cast Iron		GR.10 鋁 Aluminium		GR.11 銅 Copper	
切削速度 Vc m/min		10~20		10~20		8~15		5~10		4~10		8~15		8~18		15~30		10~25	
型號 Code No.	刃徑 Dc	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)	Feed 進給速度 (mm/min)	Finishing allowance 切削餘量 (mm)
R329-3	3	0.02~0.03	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	0.01~0.02	0.03~0.08	0.018~0.03	0.05~0.15	0.028~0.045	0.05~0.1	0.018~0.03	0.1~0.2	0.018~0.03	0.05~0.15
R329-4	4	0.025~0.045	0.1~0.2	0.03~0.045	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	0.05~0.1	0.028~0.045	0.1~0.2	0.028~0.045	0.1~0.2
R329-5	5	0.04~0.6	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	0.05~0.1	0.04~0.06	0.1~0.2	0.04~0.06	0.1~0.2
R329-6	6	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R329-7	7	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	0.05~0.1	0.06~0.09	0.1~0.2	0.05~0.09	0.1~0.2
R329-8	8	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R329-9	9	0.06~0.15	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	0.05~0.1	0.07~0.12	0.1~0.2	0.06~0.12	0.1~0.2
R329-10	10	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R329-11	11	0.07~0.13	0.1~0.2	0.07~0.13	0.1~0.2	0.06~0.12	0.1~0.2	0.05~0.12	0.1~0.2	0.025~0.06	0.03~0.08	0.06~0.12	0.1~0.2	0.07~0.13	0.05~0.1	0.08~0.17	0.1~0.2	0.07~0.13	0.1~0.2
R329-12	12	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.08~0.15	0.1~0.2	0.06~0.13	0.1~0.2	0.03~0.075	0.03~0.08	0.08~0.15	0.1~0.2	0.08~0.15	0.05~0.1	0.08~0.18	0.1~0.2	0.08~0.15	0.1~0.2

1. Please work with good rigidity / high precision facilities and collet chuck.
2. Please choose proper cutting fluid.
3. The cutting data is reference value only. Please adjust it according to your real working conditions.
4. If RPM is lower the reference value, the Feed rate (fz) and RPM should be reduced by the same proportion.
5. If vibration occurs during cutting, please reduce cutting parameter.

1. 請使用剛性好、精度高的設備和夾具。
2. 請選擇適用於工件材料的切削液。
3. 此切削條件表中的數值為切削條件的基準值，實際加工時，請考慮加工形狀、目的、使用機台等因素，對切削條件進行調整。
4. 如果機台轉速低於表中所列數值，則進給速度應與轉速按同一比例降低。
5. 切削加工時如果發生振顫，請降低切削條件。



Interchangeable Multi-purpose End Mill Cutter
交換式多功能立銑刀頭

1. Double-contact surface (taper and face)
2. Solid carbide cutter head and body shank
3. High accuracy, rigidity and efficiency in cutting
4. High economy value with various interchangeable cutter heads
5. Trapezoidal-designed thread reduces thread chipping
6. Runout within 5μm

1. 雙面拘束(斜度+平面)
2. 全碳化鎢鋼刀柄刀頭
3. 高精度、高剛性、高效率的切削加工
4. 經濟效益大，多種刀頭可替換
5. 螺紋採用梯形設計，不易崩牙
6. 同心度5μm以內

D×L×d1 (L1×D1)	Code No.
10×70×2.0 (15×9.7)	EMH10U1007015
10×90×2.0 (30×9.7)	EMH10U1009030
10×110×2.0	EMH10S1011000
12×80×2.5 (18×11.7)	EMH12U1208018
12×100×2.5 (36×11.7)	EMH12U1210036
12×120×2.5	EMH12S1212000
16×90×3.5 (24×15.5)	EMH16U1609024
16×120×3.5 (48×15.5)	EMH16U1612048
16×150×3.5	EMH16S1615000
20×100×5.0 (30×19.5)	EMH20U2010030
20×130×5.0 (60×19.5)	EMH20U2013060
20×180×5.0	EMH20S2018000
25×110×5.0 (38×24.5)	EMH25U2511038
25×160×5.0 (75×24.5)	EMH25U2516075
25×210×5.0	EMH25S2521000

※d1: coolant hole

E140HX 超微粒鎢鋼塗層多用途立銑刀
Multipurpose End Mills

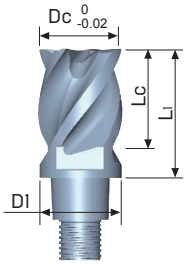
MG Carbide | AlTiCrN HX | 38° 41° | 不等 4 | N 75° | 90°

E140HX-Cutter

Code No.	Dc 0 -0.02	Lc mm	L1 mm	d1 mm	AlTiCrN HX
EMH10-SM10	10	11	16	9.7	●
EMH12-SM12	12	13	19	11.7	●
EMH14-SM14	14	15	22	11.7	○
EMH16-SM16	16	17	25	15.5	●
EMH18-SM18	18	19	28	15.5	○
EMH20-SM20	20	21	31	19.5	●
EMH25-SM25	25	26	39	24.5	●

Steel < 48HRC

P	H	M	K	N	S
●	●	●	●	○	○



E143HX 超微粒鎢鋼強力鋁用立銑刀
End Mills For Aluminum

MG Carbide | AlTiCrN HX | 40° | 不等 3 | N 20° | 90°

E143HX-Cutter

Code No.	Dc 0 -0.02	Lc mm	L1 mm	d1 mm	Blank
EMH10-SA10	10	11	16	9.7	●
EMH12-SA12	12	13	19	11.7	●
EMH14-SA14	14	15	22	11.7	○
EMH16-SA16	16	17	25	15.5	●
EMH18-SA18	18	19	28	15.5	○
EMH20-SA20	20	21	31	19.5	●
EMH25-SA25	25	26	39	24.5	●

Aluminium

P	H	M	K	N	S
				●	

B263TX 極超微粒鎢鋼塗層圓頭立銑刀
Ball Nose End Mills

SMG Carbide | AlTiSiN TX | 30° | 2 | N 75° | U

B263TX-Cutter

Code No.	Dc 0 -0.02	R ±0.01	Lc mm	L1 mm	d1 mm	AlTiSiN TX
EMH10-BE10	10	5	11	16	9.7	●
EMH12-BE12	12	6	13	19	11.7	●
EMH16-BE16	16	8	17	25	15.5	●
EMH20-BE20	20	10	21	31	19.5	●
EMH25-BE25	25	12.5	26	39	24.5	●

Steel < 62HRC

P	H	M	K	N	S
●	●		○		

B254TX 極超微粒鎢鋼塗層4刃圓頭立銑刀
Ball Nose End Mills - 4 Flutes

SMG Carbide | AlTiSiN TX | 45° | 4 | N 7-10° | U

B254TX-Cutter

Code No.	Dc 0 -0.02	R ±0.01	Lc mm	L1 mm	d1 mm	AlTiSiN TX
EMH10-BH10	10	5	11	16	9.7	●
EMH12-BH12	12	6	13	19	11.7	●
EMH16-BH16	16	8	17	25	15.5	●
EMH20-BH20	20	10	21	31	19.5	●
EMH25-BH25	25	12.5	26	39	24.5	●

Hardened Steel 40-70HRC

P	H	M	K	N	S
	●		○		○

Work Material

P	GR1	碳鋼 Carbon Steel	
	GR2	低合金鋼鐵<24HRC Low-alloyed Steel	
	GR3	高合金鋼鐵<30HRC Hi-alloyed Steel	
H	GR4	硬化鋼 30~38HRC Hardened Steel	
	GR5	硬化鋼 38~48HRC Hardened Steel	
	GR6	硬化鋼 48~56HRC Hardened Steel	
	GR7	硬化鋼 56~68HRC Hardened Steel	
M	GR8	不銹鋼 Stainless Steel	
K	GR9	鑄鐵 Cast Iron	
N	GR10	鋁 Aluminium	
	GR11	銅 Copper	
	GR12	塑膠 Plastics	
	GR13	複合材料 FRP CFRP Composite Material	
	GR14	石墨 Graphite	
S	GR15	鈦合金 Titanium	
	GR16	鎳 Nickel	
	GR17	耐熱鋼 Heat-resistant Steel	

Technical Data - Materials 技術性資料 — 材料

	Materials Groups		N/mm2	HB	JIS	DIN
P	GR.1	非合金鋼鐵 Non-alloyed Steel	≦700	≦210	SS330 SS400 SS490 S10C S15C S20C S25C S30C S35C S40C S45C S50C S55C S58C SUM22 SUM22L SUM24 SUM25 SK3 SUP4	RST37-1 St37-3 St37-2 9SMn28 9SMnPb28 9SMnPb36 Ck15 Ck25 CK30 Ck45 Cf53C10 C15 C20 C22C35 C45 C55 C60 Ck55 Ck60 C105W1 C105W1
	GR.2	低合金鋼鐵<24HRC Low-alloyed Steel	700-1000	210-300	SCR415 SCR420 SCR430 SCR440 SCR445 SCM420 SCM415 SCM430 SCM440 SK1 SK2 SK3 SK5 SK6 SK7	St.44-2 St.52-3 100Cr6 21NiCrMo2 40NiCrMo22 17CrNiMo6 15Cr3 42Cr3 55Cr3 15CrMo5 36NiCr6 14NiCr10 34Cr4 41Cr4 16MnCr5 25CrMo4 34CrMo4 41CrMo4 42CrMo4 32CrMo12 50CrV4 41CrAlMo7 100Cr6 105WCr6
	GR.3	高合金鋼鐵<30HRC Hi-alloyed Steel	>1000	>300	SKD1 SKD2 SKD3 SKD4 SKD11 SKD12 SKD61 P20 P21 P30 SUP3 SUP4 SUP6 SUP3 SUP6 SUP7 SUP9 SUP10 SKH2 SKH3 SKH52 SKH55	X210Cr12 X40CrMoV5 1 X100CrMoV5 1 X210CrW12 45WCrV7 X30WCrV9 3 X30WCrV9 3KU X165CrMoV12 X45GrSi93 S6-5-2 S6/5/2 S6/5/2/5 S2/9/2 X210Cr12 G
H	GR.4	硬化鋼 30~38HRC Hardened Steel				
	GR.5	硬化鋼 38~48HRC Hardened Steel				
	GR.6	硬化鋼 48~56HRC Hardened Steel				
	GR.7	硬化鋼 56~68HRC Hardened Steel				
M	GR.8	不銹鋼 Stainless Steel	500~950	250~320	SUS301 SUS302 SUS303 SUS304 SUS316 SUS321 SUS410 SUS416 SUS420 SUS420J2 SUS430 SUS431 SUS440	X12CrNi17-7 X12CrNi18-8 X10CrNiS18-9 X5CrNi18-10 X5CrMo17-12-2 X6CrNiTi18-10 X10Cr13 X12CrS13 X30Cr13 X12CrMoS17 X20CrNi17-2 X65CrMo14
K	GR.9	鑄鐵 Cast Iron		180-280	FC100 FC150 FC200 FC250 FC300 FC350 FCD400 FCD500 FCD600 FCD700 FCMB310 FCMW330 FCMW370 FCMP490 FCMP540 FCMP590 FCMP690	GG10 GG15 GG20 GG25 GG30 GG35 GGG40 GGG50 GGG60 GGG70 GTS-35 GTS-45 GTS-55 GTS-65 GTS65-02 GTS- 70-02
N	GR.10	鋁 Aluminium		Si<10%	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	A199 ,5 A199.8 AlMnCu AlCuSiMn AiMgSiCu AlZnMgCu4.5 MgAl3Zn G-AlSi5Mg
				Si10%>	A1050 A1080 A2014 A3003 A5052 A6061 A7075 MP1	GD-AlSi12 GD-AlSi10Mg G-AlSi10Mg AlSi17C4 AlSi21CuNiMg AlSi25CuNiMg
	GR.11	銅 Copper		<250	C1220P C3710P C2400P C5210P C3602BE C3601BE C3604BE C3771BE C4622BE C4430P C6711P BC3 BC6	CuZn36Pb3 CuZn39Pb2 CuZn39Pb3 CuZn40Pb2 CuZn28Sn1 CuZn38Si1 CuZn15 CuZn36 CuZn40 ZCuZn10Zn2 CuAl5 CuAl8Fe3 CuAl10Ni5Fe4 CuBe2F40 CuSi3Mn G-CuSn5ZnPb G-CuSn10Zn
				>250	C1700P C1720P C5212P C6782BE	CuBe1.7 F55 CuBe1.7 F110 CuBe2 F70 CuBe2 F125 CuZn40A11 CuAl11Ni6Fe5 AMPCO 20
	GR.12	塑膠 Plastics			PP PS POM PC PA PMMA TFE CTFE	
	GR.13	複合材料 FRP CFRP Composite Material			GFK KFK AFK	
	GR.14	石墨 Graphite				
S	GR.15	鈦合金 Titanium	700~1250	210~370	TP(TR)270H© TP(TR)340H© TP(TR)550H(C) TP(TR)480H© TP(TR)270Pd© TP(TR)340Pd TP(TR)550Pd© TP(TR)480Pd© TAP6400	Ti 1 Ti 2 Ti 3 Ti 4 Ti 1 Pd Ti 2 Pd Ti 3 Pd Ti99.7 Ti99.8 TiAl6V4 TiAl6V4ELI TiAl5Sn2.5 TiAl4Mo4Sn4Si0.5 TiCu2
	GR.16	鎳 Nickel	900~1200	260~350	Incoloy 800 Incoloy825 I Inconel 400 nconel 625 Inconel 600 Inconel 700 Inconel 713 Inconel 718 Haynes 600 Hastelloy C Nimocast PD36 Nimonic PE13 Nimonic 901 Nimonic 75 Rene 95 ,Monet400, Mar-M432, Waspaloy ,Jessop G64 AirResist213 Jetalloy209	
	GR.17	耐熱鋼 Heat-resistant Steel	900-1400	210-400	SUH309 SUH310 SUH330 SUH1 SUH31 SUH35 SUH321 SUH430 SUH420J1	X15CrNiSi20-12 X15CrNiSi25-20 X45CrSi9-3 X45CrNiW18-9 X53CrMnNiN21-9 X10CrNiTi18-9 X6Cr17 X20Cr13

AISI/SAE	BS	GB
1010 1015 1020 1025 1030 1035 1040 1045 1050 1055 1060 W1 W210 1213 12L13 12L14	230M07 080M15 060A35 080M46 060A35 080M46 060A52 070M55 080A62 070M55 080 A 62 060A 96 BW 1A BW2	Q215AF Q235A~D 10 15 20 25 30 35 40 45 50 55 60 Y12 Y15pb
9840 4340 5132 5140 5115 4130 4137, 4135 4140, 4142 4140 L3 L6 ASTM A350LF5 8620 8740 5010 5140 5155 9262 52100	708M40 708M40 722M24 735A50 805M20 311-TYPE7 820A16 523M15 527A60 534A99 4360 43C 4360 50B	15Cr 20Cr 30Cr 40Cr 45Cr 20CrMo 15CrMo 30CrMo 42CrMo
D3 H13 A2 S1 H21 HW3 D3 M2 M35 M7 HNV3	BD3 BH13 BA2 BS1 BH21 401S45 4959BA2 BM2 BM35	Cr12 C12MoV Cr12MoV1 CrMo1v 4Cr5MoSiV1 W18Cr4V W18Cr4V5Co5 W6Mo5Cr4V2Co5 W6MoCr4V3 55CrMnA 85 60Si2Mn 50CrVa
AISI301 AISI302 AISI303 AISI304 AISI316 AISI321 AISI410 AISI416 AISI420 AISI430 AISI431 AISI440	430S15 410S21 420S45 431S29 430S17 304S11 303S21 304C12 321S12 316S16 317S12 403S17	1Cr17Ni7 1Cr18Ni9 Y1Cr18Ni9 0Cr18Ni9 0Cr17Ni12Mo2 0Cr18Ni11Ti 1Cr13 Y1Cr13 3Cr13 1Cr17 7Cr17 2Cr13 Y3Cr13
No20B No25B No30B No35B No45B No50B 60-40-18 80-55-06 A43D2 100-70-03 32510 40010 50005 70003 A220-70003 A220-80002	Grade150 Grade220 Grade260 Grade300 Grade350 Grade400 SNG420/12 SNG500/7 SNG600/3 SNG700/2 8290/6 B340/12 P440/7 P510/4 P570/3 P690/2	HT-100 HT-150 HT-200 HT-250 HT-300 HT350 QT400-15 QT450-10 QT500-7 QT600-3 QT700-2 KTH-330-08 KTZ-450-06 KTZ-550-04 KTZ-700-02
2014 3003 5052 6061 7075 AZ31C A296.0 A331.1	LM4 LM12 LM16 LM21 LM22 LM24 LM25 LM27	L1 L3 LD10 LF2 LF21 LD2 LC4 LC9
S12A SC84A SC102A AA336 A332 B26M520.0	LM5 LM6 LM9 LM13 LM28 LM29 LM30	ZL104 Y104 Y102 ZL102 ZL301
C36000 C37700 C44300 C46200 C83600 C90500 CT-00 10-N 75Cu-5Al 77CU-15Pb-7Sn-1Fe 1C Am CDA544 CDA65600	CA104 CZ121 CZ122 CZ108 CZ114 CDA544 CDA65600 CDA656	ZCuSn5Pb5Zn5 G-CuSn10Z HPb 61-1 HPb 59-1 HSn 62-1
C17000 C17200		QBe1.7 QBe2 HAl 60-1-1
AMS R54520 AMS R56400 AMS R56401 Gr.1 Gr.2 Gr.3 Gr.4 Gr.11 Gr.7 Gr.5	TA14/17 TA10-13 TA28 TA11	TA0 TA1 TA2 TA3 TA9 TC4
AISI309 AISA310 HNV3 EV9 AISI321 AISI430 AISI420	330C11 Hr5.203-4 3146-3 HR8 3072-76 Hr401.601	2Cr23Ni13 2Cr25Ni20 4Cr9Si2 5Cr21Mn9Ni4N 0Cr18Ni11Ti 1Cr17 2Cr13

塗層特性

Features of Coating

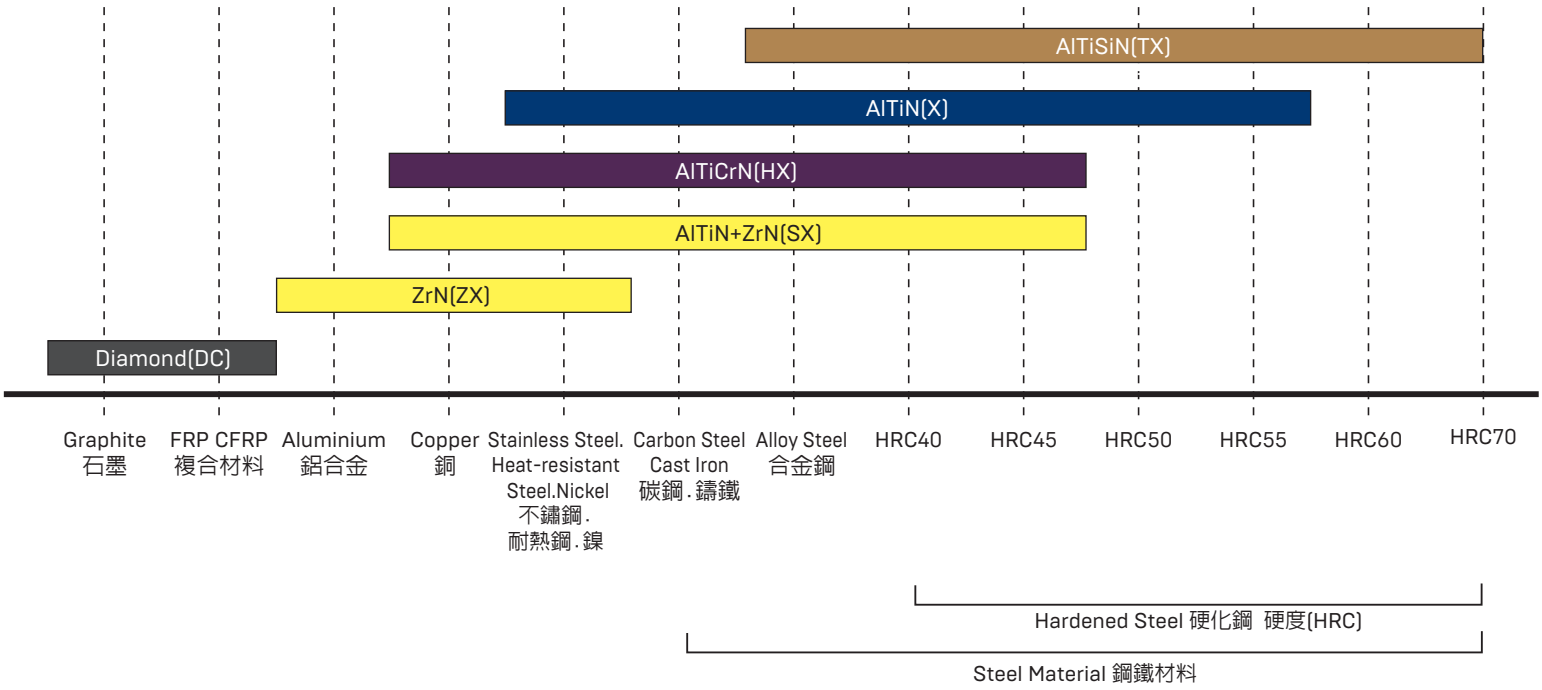
塗層種類 Type	顏色 Color	奈米硬度 (HV) Hardness	奈米厚度 (μm) Thickness	摩擦係數 Coefficient of Friction	最高應用溫度 (℃) Heat resistance	刀具材質 Cutting Tools Material	應用 Application
AlTiSiN (TX)	Tan 古銅色	4300	1~3	0.3	1200	Solid Carbide 碳化鎢鋼	Hardened steel 中高硬度鋼鐵硬化鋼 HRC<70
AlTiN (X)	Blue black 藍黑色	4000	1~3	0.6	900	Solid Carbide 碳化鎢鋼	Carbon steel, Alloyed steel, Hardened steel, Cast iron 碳鋼、合金鋼硬化鋼、鑄鐵 HRC<60
AlTiN+ZrN (SX)	Yellow brown 金黃色	3800	1~4	0.4	800	Solid Carbide 碳化鎢鋼	Carbon steel, Alloyed steel, Stainless steel, Cast iron 多用途材質碳鋼、合金鋼不鏽鋼、鑄鐵 HRC<48
AlTiCrN (HX)	Purple black 紫黑色	3800	1~4	0.25	800	Solid Carbide 碳化鎢鋼	Carbon steel, Alloyed steel, Stainless steel, Cast iron 多用途材質碳鋼、合金鋼不鏽鋼、鑄鐵 HRC<48
ZrN (ZX)	Yellow brown 金黃色	2800	1~4	0.5	550	Solid Carbide 碳化鎢鋼	Aluminium, Copper, Stainless steel, Titanium, Hard-cut material 銅合金、不鏽鋼、鈦合金等難切削材
Diamond (DC)	Black 黑色	9000	6~13	0.15	600	Solid Carbide 碳化鎢鋼	Graphite 石墨
TiN (N)	Golden 金黃色	2400	1~7	0.35	600	HSS 高速鋼	General steel, Wear parts 一般鋼鐵材料耐磨零件
TiCN (C)	Blue gray 藍灰色	2800	1~4	0.2	400	HSS 高速鋼	General steel, Wear parts 一般鋼鐵材料耐磨零件

各塗層與被切削材的適用性

Usage of each coating for Milling Steel

刀具材質：碳化鎢鋼

Cutting Tools Material:Solid Carbide



Hardness Conversion Table / 硬度換算表

HRC	HB	HV10	N/mm²
	71	75	240
	76	80	255
	81	85	270
	86	90	285
	90	95	305
	95	100	320
	100	105	335
	105	110	350
	109	115	370
	114	120	385
	119	125	400
	124	130	415
	128	135	430
	133	140	450
	138	145	465
	143	150	480
	147	155	495
	152	160	510
	157	165	530
	162	170	545
	166	175	560
	171	180	575
	176	185	595
	181	190	610
	185	195	625
	190	200	640
	195	205	660
	199	210	675
	204	215	690
	209	220	705
	214	225	720
	219	230	740
	223	235	755
	228	240	770
	233	245	785
22	238	250	800
23	242	255	820
24	247	260	835
25	255	268	860
26	258	272	870
27	266	280	900

HRC	HB	HV10	N/mm²
28	273	287	920
29	278	293	940
30	287	302	970
31	295	310	995
32	301	317	1020
33	311	327	1050
34	319	336	1080
35	328	345	1110
36	337	355	1140
37	346	364	1170
38	354	373	1200
39	363	382	1230
40	372	392	1260
41	383	403	1300
42	393	413	1330
43	402	423	1360
44	413	434	1400
45	424	446	1440
46	435	458	1480
47	449	473	1530
48	460	484	1570
49	472	497	1620
50	488	514	1680
51	501	527	1730
52	517	544	1790
53	532	560	1845
54	549	578	1910
55	567	596	1980
56	584	615	2050
57	607	639	2140
58	622	655	
59		675	
60		698	
61		720	
62		745	
63		773	
64		800	
65		829	
66		864	
67		900	
68		940	

Metric MM

MM

$$Vc = \frac{\pi \times Dc \times N}{1000}$$

$$N = \frac{Vc \times 1000}{\pi \times Dc}$$

$$Vf = N \times Z \times fz$$

$$T = \frac{L}{Vf}$$

Vc=	Cutting Speed 切削速度	m/min
Dc=	Cutter Diameter 切削直徑	mm
N =	RPM 回轉速度	rev/min
Vf =	Feed Speed 每分鐘進給	mm/min
fz =	Feed Per Tooth 每刃進給	mm/tooth
fn =	Feed Per Revolution 每轉進給	mm/rev
Z =	Number of Flutes 刃數	Z
T =	Time of Cut In Minutes 切削時間	mm
L =	Cut Length 切削長度	mm
Ap=	Axial depth of cut 軸向切削深度	mm
Ae=	Radial depth of cut 切削寬度	mm

English INCH

INCH

$$Vc = \frac{\pi \times Dc \times N}{12}$$

$$N = \frac{Vc \times 12}{\pi \times Dc}$$

$$Vf = N \times Z \times fz$$

$$T = \frac{L}{Vf}$$

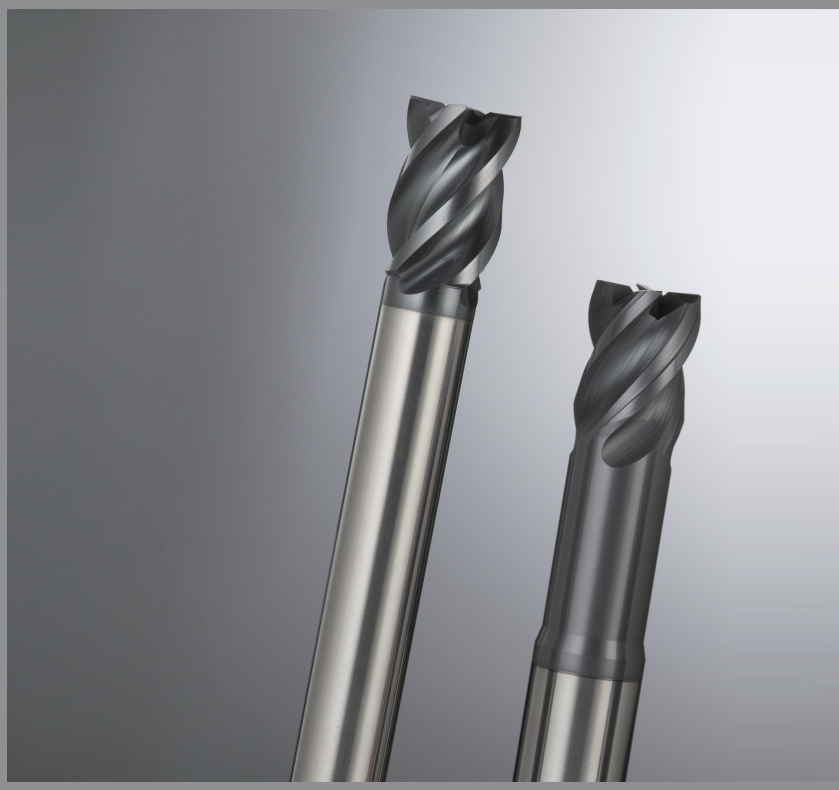
Vc=	Cutting Speed 切削速度	inch/min
Dc=	Cutter Diameter 切削直徑	inch
N =	RPM 回轉速度	rev/min
Vf =	Feed Speed 每分鐘進給	inch/min
fz =	Feed Per Tooth 每刃進給	inch/tooth
fn =	Feed Per Revolution 每轉進給	inch/rev
Z =	Number of Flutes 刃數	Z
T =	Time of Cut In Minutes 切削時間	inch
L =	Cut Length 切削長度	inch
Ap=	Axial depth of cut 軸向切削深度	inch
Ae=	Radial depth of cut 切削寬度	inch

ISO Tolerance measure table (μm)

ISO公差測量表

ϕmm	<3	3-6	6-10	10-18	18-30	30-50	50-65	65-80
e7	-14 -24	-20 -32	-25 -40	-32 -50	-40 -61	-50 -75	-60 -90	-60 -90
e8	-14 -28	-20 -38	-25 -47	-32 -59	-40 -73	-50 -89	-60 -106	-60 -106
e9	-14 -39	-20 -50	-25 -61	-32 -75	-40 -92	-50 -112	-60 -134	-60 -134
h5	0 -4	0 -5	0 -6	0 -8	0 -9	0 -11	0 -13	0 -13
h6	0 -6	0 -8	0 -9	0 -11	0 -13	0 -16	0 -19	0 -19
h7	0 -10	0 -12	0 -15	0 -18	0 -21	0 -25	0 -30	0 -30
h8	0 -14	0 -18	0 -22	0 -27	0 -33	0 -39	0 -46	0 -46
h9	0 -25	0 -30	0 -36	0 -43	0 -52	0 -62	0 -74	0 -74
h10	0 -40	0 -48	0 -58	0 -70	0 -84	0 -100	0 -120	0 -120
h11	0 -60	0 -75	0 -90	0 -110	0 -130	0 -160	0 -190	0 -190
h16	0 -600	0 -750	0 -900	0 -1100	0 -1300	0 -1600	0 -1900	0 -1900
js14	+125 -125	+150 -150	+180 -180	+215 -215	+260 -260	+310 -310	+370 -370	+370 -370
js16	+300 -300	+375 -375	+450 -450	+550 -550	+650 -650	+800 -800	+950 -950	+950 -950
k11	+60 0	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+190 0
k12	+100 0	+120 0	+150 0	+180 0	+210 0	+250 0	+300 0	+300 0
m6	+8 +2	+12 +4	+15 +6	+18 +7	+21 +8	+25 +9	+30 +11	+30 +11
m7	+12 +2	+16 +4	+21 +6	+25 +7	+29 +8	+34 +9	+41 +11	+41 +11
z9	+51 +26	+65 +35	+78 +42	+103 +60	+140 +88	+198 +136	+246 +172	+284 +210
H5	+4 0	+5 0	+6 0	+8 0	+9 0	+11 0	+13 0	+13 0
H6	+6 0	+8 0	+9 0	+11 0	+13 0	+16 0	+19 0	+19 0
H7	+10 0	+12 0	+15 0	+18 0	+21 0	+25 0	+30 0	+30 0
H8	+14 0	+18 0	+22 0	+27 0	+33 0	+39 0	+46 0	+46 0
H9	+25 0	+30 0	+36 0	+43 0	+52 0	+62 0	+74 0	+74 0
H10	+40 0	+48 0	+58 0	+70 0	+84 0	+100 0	+120 0	+120 0
H11	+60 0	+75 0	+90 0	+110 0	+130 0	+160 0	+190 0	+190 0
P6	-6 -12	-9 -17	-12 -21	-15 -26	-18 -31	-21 -37	-26 -45	-26 -45
P7	-6 -16	-8 -20	-9 -24	-11 -29	-14 -35	-17 -42	-21 -51	-21 -51
P9	-6 -31	-12 -42	-15 -51	-18 -61	-22 -74	-26 -88	-32 -106	-32 -106

7leaders®
The Art of Cutting



台灣總公司
七駿科技股份有限公司
7-Leaders Corp.
台灣台中市407台中工業區一路98-110號
No. 98-110, 1st Rd., Taichung Industrial Park,
Taichung City 40767, Taiwan
TEL:+886-4-2359-7000
FAX:+886-4-2359-7118
E-mail:etm@7Leaders.com

上海分公司
七立得貿易(上海)有限公司
Seven Leaders Trading (Shanghai) Co. Ltd
201102上海市閔行區閔虹路166弄3號2602室
Room 2602, No.3, 166 Lane, Min Hong Road, Min Hang Dist., Shanghai 201102
TEL:+86-21-5868-1132
FAX:+86-21-5868-1136
E-mail:shanghai@7Leaders.cn

WEBSITE

www.7leaders.com