

蘇氏精密工具

品質倍受國際肯定

創立於1976年，35載歲月一路走來，均秉持積極專業技術，生產高速鋼鑽頭、高鈷端銑刀、鎢鋼鑽頭、鎢鋼立銑刀等切削刀具；並代銷歐洲品牌ERA、BOHLER 之高速鋼材，及提供本公司最專業的熱處理為客戶服務。

公司始終以「不斷創新突破，技術提昇，現代化經營」作為全體員工共同努力的信念。我們除了不斷鑽研切削新技術，更投入鉅資不斷引進歐美最先進的加工設備，以確保蘇氏刀具達到世界級的品質標準。30年來，我們以一步一腳印的步伐追求公司成長。未來，我們將持續努力以卓越的技術背景，為客戶提供最佳的服務。

SU'S PRECISION TOOLS CO., LTD. was established in 1976. With 35 years of manufacturing experience, Su's Company is dedicated manufacturer of high speed steel drills, high cobalt end mills, solid carbide drills, and solid carbide end mills. In addition, our business range includes distribution of ERA and BOHLER high speed steels from Europe, and services of heat treatment.

Since the company was established, each one at Su's has been fully dedicated to follow the company's policy as "Constant Innovation, Technology Upgrading, Modernized Operation". We have constantly researched the latest cutting technology and have heavily invested in a wide range of the most advanced European and American machining equipment which enables Su's tools to achieve world class quality level. For over 30 years, we have always pursued the company's growth at steady steps. In the future, we will keep moving to provide the best possible cutting tools for our customers. All these are backed by our outstanding technological background.



真空熱處理
Vacuum Heat
Treatment Furnace

先進刀具研磨機
Advanced Grinders



Su's Precision Tools Internationally Recognized Quality



自動化製程
Automatic Manufacturing
Process

嚴格檢驗流程
Rigorous Quality Inspection



高速鋼鑽頭		HSS Drills	頁次 Page
	D-101 直柄麻花鑽頭 (鑽頭組) Straight Shank Twist Drills		9~11
	B-102 圓鑽 Drill Blanks		12
	N-103 諾氏鑽頭 Noss Drills		13~14
	T-104 斜柄鑽頭 Taper Shank Twist Drills		15~17
	L-1210~1230 直柄長鑽頭 Straight Shank Twist Long Drills		18~20
	DS-105 高速短刃鑽頭 High Speed Stub Drills		21
	DS-106 覆TiAlN高速短刃鑽頭 TiAlN High Speed Stub Drills		22
	G-112 深孔用 - 強力型直柄鑽頭 Conical Fluted Straight Shank Twist Drills		23
	K-1310~1330 深孔用 - 強力型直柄長鑽頭 Conical Fluted Straight Shank Twist Long Drills		24~25
	U-111 不銹鋼用 - 直柄高鈷鑽頭 Cobalt HSS Straight Shank Twist Drills For Stainless Steel		26
	I-113 氮化鈦 - 直柄麻花鑽頭 TiN Coated Straight Shank Twist Drills		27
	Q-114 鋁用-直柄鑽頭 Straight Shank Twist Drills For Aluminum		28
	M-118 / 119 沈頭鑽頭 Sink & Step Drills For Screw Thread		29
	P-115 / 116 NC定點鑽頭 NC Spotting Drills		30






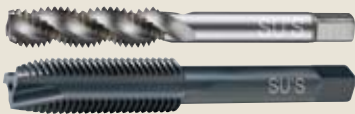


高速鋼鑽頭	HSS Drills	頁次 Page
	<p>TP-152 鋼構用斜柄鑽頭 Taper Shank Drills For Iron Frames</p>	30
	<p>2T71 斜柄高鈷鑽頭 Taper Shank HSS Cobalt Drills</p>	31
	<p>2N71 諾氏高鈷鑽頭 Noss HSS Cobalt Drills</p>	31
	<p>U-111 小徑鑽頭 - 不銹鋼錶帶專用小徑鑽頭 Small Diameter Drills - Cobalt Drills For Watchstrap</p>	32
	<p>UD-151 小徑鑽頭 - 一般錶帶專用小徑鑽頭 Small Diameter Drills - HSS Drills For Watchstrap (Fast Helix)</p>	32
	<p>LD-154 / 155 左旋鑽頭短刃型 / 長刃型 Left Hand Helix Straight Shank HSE Twist Drills stub & Long Flute</p>	33
	<p>DS 高速短刃鑽頭切削條件 Cutting Conditions Of High Speed Stub Drills</p>	34
	<p>莫氏圓錐柄規格 Morse NO. Of Taper Shank</p>	35
	<p>鋼構用斜柄鑽頭切削條件 Drilling Conditions Of Drills For Iron Frames</p>	36
	<p>HSS鑽頭之切削條件選擇表 I-IV Cutting Conditions Selecting Table-1~4 For HSS Drills</p>	37~40
	<p>麻花鑽頭尖頭的應用 Applications Of Twist Drills</p>	41
	<p>麻花鑽頭加工異常原因及對策 I-III Trouble Shooting Table-1~3 For Twist Drill Machining</p>	42~44
	<p>鑽削計算 Drilling Calculation Formulas</p>	45

高鈷端銑刀	HSE End Mills	頁次 Page
	EM-4141 / 4143 高鈷端銑刀 - 標準2刃、長2刃型 HSE End Mills - Standard 2 & Long 2 Flutes	46
	EM-4142 / 4144 高鈷端銑刀 - 標準4刃、長4刃型 HSE End Mills - Standard 4 & Long 4 Flutes	47
	EM-4145 / 4147 高鈷端銑刀 - 覆TiCN標準2刃、長2刃型 HSE End Mills-TiCN Coated Standard 2 & Long 2 Flutes	48
	EM-4146 / 4148 高鈷端銑刀 - 覆TiCN標準4刃、長4刃型 HSE End Mills-TiCN Coated Standard 4 & Long 4 Flutes	49
	EM-4141 / 4142 高鈷端銑刀 - 標準2刃、4刃型 (英制) HSE End Mills-Standard 2 & 4 Flutes (Inch)	50
	EM-4145 / 4146 高鈷端銑刀 - 覆TiCN標準2刃、4刃型 (英制) HSE End Mills-TiCN Coated Standard 2 & 4 Flutes (Inch)	51
	EM 高鈷端銑刀切削條件 Cutting Conditions Of HSE End Mills	52



鎢鋼鑽頭	Solid Carbide Drills	頁次 Page
	WD-1711 銑刀柄鎢鋼高速鑽頭 End Mill Shank-Solid Carbide High Speed Drills	53
	WD-1721 TiAlN鎢鋼直柄短刃鑽頭DIN 1897 TiAlN Solid Carbide Stub Drills	54
	WD-1722 鎢鋼直柄短刃鑽頭DIN 1897 Solid Carbide Stub Drills	55
	WD-1731 TiAlN鎢鋼直柄鑽頭DIN 338 TiAlN Solid Carbide Straight Shank Drills	56
	WD-1732 鎢鋼直柄鑽頭DIN 338 Solid Carbide Straight Shank Drills	57
	WP-1751 / 1761 TiAlN鎢鋼NC定點鑽頭 TiAlN Solid Carbide NC Spotting Drills	58
	WP-1752 / 1762 鎢鋼NC定點鑽頭 Solid Carbide NC Spotting Drills	59
	WD 鎢鋼鑽頭切削條件 Cutting Conditions Of Solid Carbide Drills	60~62

鎢鋼立銑刀	Solid Carbide End Mills	頁次 Page
	WE-4201 極細微粒碳化鎢立銑刀 (2刃) Micro Grain Carbide End Mills (2 Flutes)	63
	WE-4301 極細微粒碳化鎢立銑刀 (3刃) Micro Grain Carbide End Mills (3 Flutes)	64
	WE-4401 極細微粒碳化鎢立銑刀 (4刃) Micro Grain Carbide End Mills (4 Flutes)	65
	WE-4202 極細微粒碳化鎢長刃立銑刀 (2刃) Micro Grain Carbide Long Flute End Mills (2 Flutes)	66
	WE-4402 極細微粒碳化鎢長刃立銑刀 (4刃) Micro Grain Carbide Long Flute End Mills (4 Flutes)	67
	WE-4221 極細微粒碳化鎢圓鼻立銑刀 (2刃) Micro Grain Carbide Corner-Radius End Mills (2 Flutes)	68
	WE-4421 極細微粒碳化鎢圓鼻立銑刀 (4刃) Micro Grain Carbide Corner-Radius End Mills (4 Flutes)	69
	WE-4241 極細微粒碳化鎢微小徑立銑刀 (2刃) Micro Grain Carbide Micro-Diameter End Mills (2 Flutes)	70
	WE-4251 極細微粒碳化鎢長頸小徑立銑刀 (2刃) Micro Grain Carbide Long-Neck Short-Flute End Mills (2 Flutes)	71
	WE-4601 極細微粒碳化鎢立銑刀 (6刃) Micro Grain Carbide End Mills (6 Flutes)	72
	WE-4211 極細微粒碳化鎢球型立銑刀 (2刃) Micro Grain Carbide Ball End Mills (2 Flutes)	73
	WE-4411 極細微粒碳化鎢球型立銑刀 (4刃) Micro Grain Carbide Ball End Mills (4 Flutes)	74
	WE-4212 極細微粒碳化鎢長柄球型立銑刀 (2刃) Micro Grain Carbide Long-Shank Ball End Mills (2 Flutes)	75
	WE-4242 極細微粒碳化鎢微小徑球型立銑刀 (2刃) Micro Grain Carbide Micro-Diameter Ball End Mills (2 Flutes)	76
	WE-4252 極細微粒碳化鎢長頸小徑球型立銑刀 (2刃) Micro Grain Carbide Long-Neck Short Flute Ball End Mills (2 Flutes)	77
	WE-4231 極細微粒碳化鎢鋁合金用立銑刀 (2刃) Micro Grain Carbide For Aluminum Alloy Processing End Mills (2 Flutes)	78

鎢鋼立銑刀	Solid Carbide End Mills	頁次 Page
	WE-4331 極細微粒碳化鎢鋁合金用立銑刀 (3刃) Micro Grain Carbide For Aluminum Alloy Processing End Mills (3 Flutes)	79
	WE-4232 極細微粒碳化鎢鋁合金用長刃立銑刀 (2刃) Micro Grain Carbide Long Length Of Cut For Aluminum Alloy Processing End Mills (2 Flutes)	80

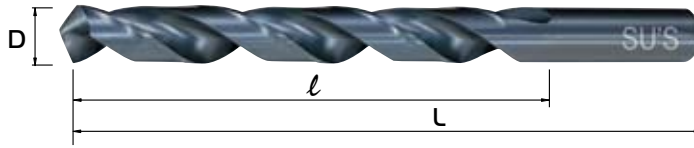
絲攻系列	TAPS Series	頁次 Page
	絲攻系列 TAPS SERIES	81
	FTL-82531 TiN 粉末擠壓絲攻—長牙 TiN Coated ASP Forming Taps-Long Thread	82~83
	FTL-82531 TiN 擠壓絲攻—長牙 TiN Coated Forming Taps-Long Thread	84~85
	FT-82511 TiN 擠壓絲攻 TiN Coated Forming Taps	86~88
	FTL-82031 非鐵合金用擠壓絲攻—長牙 Forming Taps For Non-Ferrous Metals-Long Thread	89~90
	FTL-82011 非鐵合金用擠壓絲攻 Forming Taps For Non-Ferrous Metals	91
	TAP-501 / 511 SFT螺旋絲攻 / POT先端絲攻 SFT Spiral Flute Taps / POT Spiral Point Taps	92~93
	TAP-502 S系列螺旋絲攻 SSP S Series Spiral Flute Taps SSP	94~95
	TAP-512 S系列先端絲攻 SGN S Series Spiral Point Taps SGN	96~97

絲攻系列	TAPS Series	頁次 Page
	TAP = 切削 + 塑性加工的母螺紋造型法 Tap=Cutting+Female Thread Produced By Soft Machining	98
	擠壓絲攻螺紋下孔徑表 Recommended Drill Hole Sizes For Forming Taps	99~100
	螺絲攻下孔徑寸法表 Tap Drill Hole Sizes	101~102
	SR 精度表 SR Limits	103
	切削速度與切削液 Recommended Tapping Speeds & Lubricants	104
	擠壓絲攻攻牙作業發生異常原因及對策 Trouble Shooting For Forming Taps Machining	105~106
	切削絲攻攻牙作業發生異常原因及對策 Trouble Shooting For Cutting Taps Machining	107~110
	硬度換算表 Hardness Conversion Table	111
	線規號數、字母、英制、公制換算表 Conversion Table For Code Number, Character, Inch And Metric	112
	英制、公制對照表 Inch / Metric Conversion Table	113

攜帶式 鑽頭尖研機	Drills Re-Sharpening Machine	頁次 Page
	SUS-1 小型鑽頭尖研機 (Ø2.0mm - 13.0mm) Drill Re-Sharpening Machine (Ø2.0mm - 13.0mm)	114~115
	SUS-2 大型鑽頭尖研機 (Ø8.0mm - 25.5mm) Drill Re-Sharpening Machine (Ø8.0mm - 25.5mm)	114~115

直柄麻花鑽頭

Straight Shank Twist Drills



D-101

- ◎適用於一般鋼料，HRC 30以下之合金鋼、鑄鐵、鑄鋼等被切削材。
- ◎適合一般鑽床、車床、桌上車床之鑽孔加工。

- ◎Suitable for drilling General Steels, Alloy Steels with hardness under HRC 30, Cast Iron and Cast Steel, etc.
- ◎Suitable for drilling operations on drilling machines, lathes and bench lathes.

HSS (m/m.) PA118°

直徑 D mm	全長 L mm	溝長 l mm
0.2	19	3.0
0.3	20	3.5
0.4	24	5.5
0.5	27	7.5
0.6	30	8.5
0.7	32	10
0.8	34	11
0.85	36	13
0.9	36	13
0.95	40	18
1.0	40	18
1.05	42	20
1.1	42	20
1.15	42	20
1.2	42	20
1.25	45	22
1.3	45	22
1.35	48	23
1.4	48	23
1.45	48	23
1.5	48	23
1.55	50	25
1.6	50	25
1.65	50	25
1.7	50	25
1.75	52	28
1.8	52	28
1.85	52	28
1.9	52	28
1.95	52	28
2.0	55	29
2.1	55	29
2.2	58	33
2.3	58	33
2.4	61	35
2.5	61	35
2.6	64	37
2.7	64	37
2.8	67	39
2.9	71	42

直徑 D mm	全長 L mm	溝長 l mm
3.0	71	42
3.1	71	42
3.2	71	42
3.3	73	45
3.4	73	45
3.5	73	45
3.6	76	48
3.7	76	48
3.8	76	48
3.9	79	51
4.0	83	54
4.1	83	54
4.2	83	54
4.3	83	54
4.4	86	56
4.5	86	56
4.6	86	56
4.7	89	59
4.8	89	59
4.9	92	62
5.0	92	62
5.1	92	62
5.2	95	64
5.3	95	64
5.4	95	64
5.5	95	64
5.6	98	67
5.7	98	67
5.8	98	67
5.9	98	67
6.0	102	70
6.1	102	70
6.2	102	70
6.3	102	70
6.4	105	73
6.5	105	73
6.6	105	73
6.7	105	73
6.8	105	73
6.9	105	73

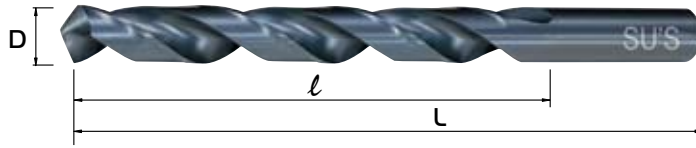
直徑 D mm	全長 L mm	溝長 l mm
7.0	105	73
7.1	108	75
7.2	108	75
7.3	108	75
7.4	111	78
7.5	111	78
7.6	111	78
7.7	114	81
7.8	114	81
7.9	114	81
8.0	114	81
8.1	117	84
8.2	117	84
8.3	117	84
8.4	121	87
8.5	121	87
8.6	121	87
8.7	121	87
8.8	124	89
8.9	124	89
9.0	124	89
9.1	124	89
9.2	127	92
9.3	127	92
9.4	127	92
9.5	127	92
9.6	130	95
9.7	130	95
9.8	130	95
9.9	130	95
10.0	130	95
10.1	133	98
10.2	133	98
10.3	133	98
10.4	133	98
10.5	137	100
10.6	137	100
10.7	137	100
10.8	140	103
10.9	140	103

直徑 D mm	全長 L mm	溝長 l mm
11.0	140	103
11.1	140	103
11.2	143	106
11.3	143	106
11.4	143	106
11.5	143	106
11.6	146	109
11.7	146	109
11.8	146	109
11.9	146	109
12.0	149	111
12.1	149	111
12.2	149	111
12.3	149	111
12.4	152	114
12.5	152	114
12.6	152	114
12.7	152	114
12.8	152	114
12.9	152	114
13.0	152	114
13.5	160	108
14.0	160	108
14.5	169	114
15.0	169	114
15.5	178	120
16.0	178	120
16.5	184	125
17.0	184	125
17.5	191	130
18.0	191	130
18.5	198	135
19.0	198	135
19.5	205	140
20.0	205	140

切削條件請參照P37-40
Cutting data P37-40

直柄麻花鑽頭

Straight Shank Twist Drills



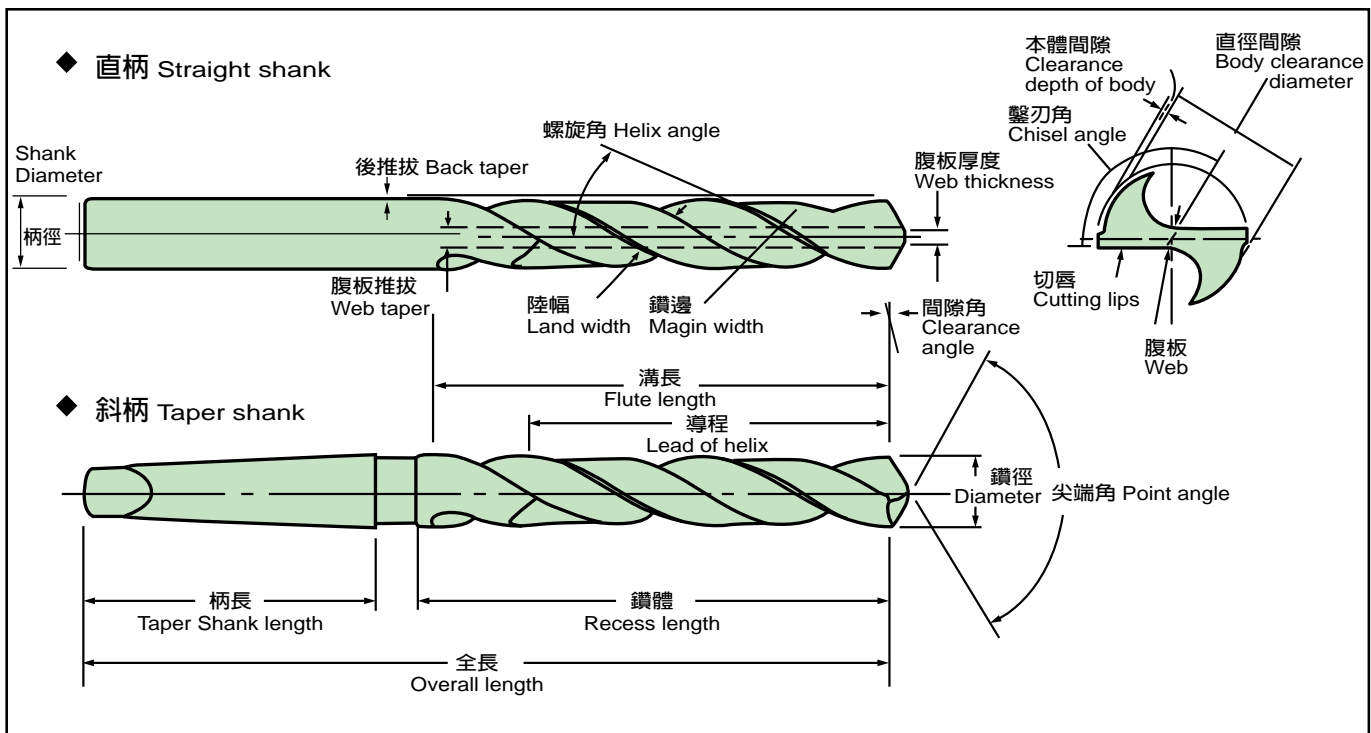
D-101

HSS (in.) PA118°

直徑 D in	全長 L mm	溝長 l mm	直徑 D in	全長 L mm	溝長 l mm	直徑 D in	全長 L mm	溝長 l mm
1/64	24	5.5	3/16	89	59	23/64	124	89
1/32	34	11	13/64	92	62	3/8	127	92
3/64	42	20	7/32	95	64	25/64	130	95
1/16	48	23	15/64	98	67	13/32	133	98
5/64	52	28	1/4	102	70	27/64	137	100
3/32	58	33	17/64	105	73	7/16	140	103
7/64	67	39	9/32	108	75	29/64	143	106
1/8	71	42	19/64	111	78	15/32	146	109
9/64	73	45	5/16	114	81	31/64	149	111
5/32	79	51	21/64	117	84	1/2	152	114
11/64	83	54	11/32	121	87			

切削條件請參照 P37~40
Cutting data P37~40

【麻花鑽頭各部名稱】



直柄鑽頭、圓棒組

Sets Of Straight Shank Twist Drills & Drill Blanks

高速鋼鑽頭 HSS Drills



29支組
29 pcs/set



25支組
25 pcs/set



100支組
100 pcs/set



100支組
100 pcs/set



121支組
121 pcs/set

鑽頭組：直柄麻花鑽頭、不銹鋼用高鈷鑽頭、鍍鈦鑽頭、鋁用鑽頭、深孔用鑽頭

Drill Sets Including:

Straight Shank Twist Drills, Cobalt Drills For Stainless Steel, TiN Coated Drills,
Straight Shank Twist Drills For Aluminum, Conical Fluted Straight Shank Twist Drills.

支數 Pieces Set	規格 Standard	包裝 Package
25 支組 25 Pieces Set	1.0 ~ 13.0mm (每隔 0.5mm/every 0.5mm)	鐵盒 Steel Case
29 支組 29 Pieces Set	1/16" ~ 1/2" (每隔 1/64"/every 1/64")	鐵盒 Steel Case
100 支組 100 Pieces Set	1.0 ~ 10.0 (每隔 0.1mm/every 0.1mm) 10.5 10.9 11.0 11.5 11.9 12.0 12.5 12.9 13.0mm	塑膠座 Plastic Case
121 支組 121 Pieces Set	1.0 ~ 13.0mm (每隔 0.1mm/every 0.1mm)	壓克力盒 Acrylic Case



B-102

HSS (m/m.)

直徑 D mm	全長 L mm
0.2	19
0.3	20
0.4	24
0.5	27
0.6	30
0.7	32
0.8	34
0.9	36
1.0	40
1.1	42
1.2	42
1.3	45
1.4	48
1.5	48
1.6	48
1.7	50
1.8	52
1.9	52
2.0	55
2.1	55
2.2	58
2.3	58
2.4	61
2.5	61
2.6	64
2.7	64
2.8	67
2.9	71
3.0	71
3.1	71
3.2	71
3.3	73
3.4	73
3.5	73
3.6	76
3.7	76
3.8	76
3.9	79
4.0	83
4.1	83
4.2	83

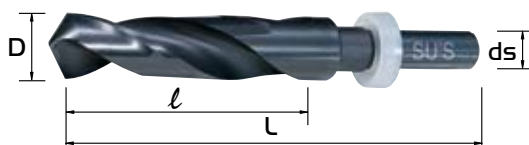
直徑 D mm	全長 L mm
4.3	83
4.4	86
4.5	86
4.6	86
4.7	89
4.8	89
4.9	92
5.0	92
5.1	92
5.2	95
5.3	95
5.4	95
5.5	95
5.6	98
5.7	98
5.8	98
5.9	98
6.0	102
6.1	102
6.2	102
6.3	102
6.4	105
6.5	105
6.6	105
6.7	105
6.8	105
6.9	105
7.0	105
7.1	108
7.2	108
7.3	108
7.4	111
7.5	111
7.6	111
7.7	114
7.8	114
7.9	114
8.0	114
8.1	117
8.2	117
8.3	117

直徑 D mm	全長 L mm
8.4	121
8.5	121
8.6	121
8.7	121
8.8	124
8.9	124
9.0	124
9.1	124
9.2	127
9.3	127
9.4	127
9.5	127
9.6	130
9.7	130
9.8	130
9.9	130
10.0	130
10.1	133
10.2	133
10.3	133
10.4	133
10.5	137
10.6	137
10.7	137
10.8	140
10.9	140
11.0	140
11.1	140
11.2	143
11.3	143
11.4	143
11.5	143
11.6	146
11.7	146
11.8	146
11.9	146
12.0	149
12.1	149
12.2	149
12.3	149
12.4	152

直徑 D mm	全長 L mm
12.5	152
12.6	152
12.7	152
12.8	152
12.9	152
13.0	152
13.5	150
14.0	150
14.5	150
15.0	150
15.5	150
16.0	150
16.5	150
17.0	150
17.5	150
18.0	150
18.5	150
19.0	150
19.5	150
20.0	150
20.5	150
21.0	150
21.5	150
22.0	150
22.5	150
23.0	150
23.5	150
24.0	150
24.5	150
25.0	150
25.5	150
26.0	150
26.5	150
27.0	150
27.5	150
28.0	150
28.5	150
29.0	150
29.5	150
30.0	150

- 2.4mm 以下雙頭平面
- 2.5mm 以上一尖一倒角
- 13.5mm 以上雙頭平面

- Blanks under 2.4 mm are two flat ends.
- Blanks over 2.5mm are one point end and one chamfering end.
- Blanks over 13.5mm are two flat ends.



N-103

- ◎諾氏鑽頭，對於一般被切削的工作性質均可適用，在鑽孔加工作業上既簡單又經濟。
- ◎柄部的“V”槽溝是用來配合夾頭的爪子，使鑽頭在作業時不會滑動。
- ◎諾氏鑽頭可利用鑽頭加工，鑽削孔徑可達35mm，甚至更大。
- ◎可使用於建築場等戶外作業，既輕便又有效果。
- ◎為了保護夾頭，柄部加裝塑膠環套，因此在使用時，就不用擔心有夾持不良之現象，進而提昇效率與壽命，促使加工孔徑更精確。

- ◎Noss Drill, suitable for general work material, is simple and economic in drilling.
- ◎The V-shot of shank, which combines with the clutches of chuck, fixes the drill during operation.
- ◎Noss Drill can be used on drilling machines, and the drilling diameter could reach 35mm even larger.
- ◎It's convenient and efficient to operate at the building sites.
- ◎For protection of the chuck, the shank is packed with a plastic ring. During operation, the drill will be collected well to get a more precise hole. The performance and the tool life will also be improved.

HSS (m/m.) PA118°

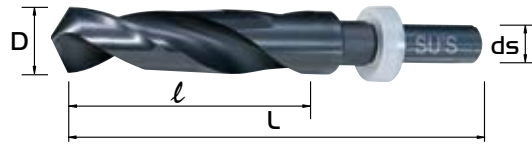
直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
13.0			
13.1			
13.2			
13.3			
13.4			
13.5			
13.6			
13.7			
13.8			
13.9			
14.0			
14.1			
14.2			
14.3			
14.4			
14.5			
14.6			
14.7	140	82	12.7
14.8			
14.9			
15.0			
15.1			
15.2			
15.3			
15.4			
15.5			
15.6			
15.7			
15.8			
15.9			
16.0			
16.1			
16.2			
16.3			
16.4			
16.5			

直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
16.6			
16.7			
16.8			
16.9			
17.0			
17.1			
17.2			
17.3			
17.4			
17.5			
17.6			
17.7			
17.8			
17.9			
18.0			
18.1			
18.2			
18.3	140	82	12.7
18.4			
18.5			
18.6			
18.7			
18.8			
18.9			
19.0			
19.1			
19.2			
19.3			
19.4			
19.5			
19.6			
19.7			
19.8			
19.9			
20.0			
20.1			

直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
20.2			
20.3			
20.4			
20.5			
20.6			
20.7			
20.8			
20.9			
21.0			
21.1			
21.2			
21.3			
21.4			
21.5			
21.6			
21.7			
21.8			
21.9	140	82	12.7
22.0			
22.1			
22.2			
22.3			
22.4			
22.5			
22.6			
22.7			
22.8			
22.9			
23.0			
23.1			
23.2			
23.3			
23.4			
23.5			
23.6			
23.7			

直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
23.8			
23.9			
24.0			
24.1			
24.2			
24.3			
24.4			
24.5			
24.6			
24.7			
24.8			
24.9			
25.0			
25.5			
26.0			
26.5			
27.0			
27.5	140	82	12.7
28.0			
28.5			
29.0			
29.5			
30.0			
30.5			
31.0			
31.5			
32.0			
32.5			
33.0			
33.5			
34.0			
34.5			
35.0			
35.5			
36.0			

切削條件請參照 P37-40
Cutting data P37-40



N-103

HSS (in.) PA118°

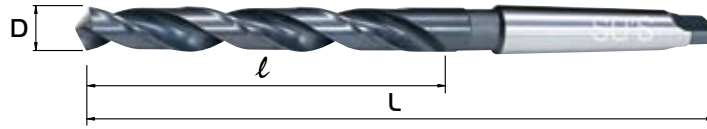
直徑 D in	全長 L mm	溝長 l mm	柄徑 ds mm
1/2	140	82	12.7
17/32			
9/16			
19/32			
5/8			
21/32			
11/16			
23/32			
3/4			
25/32			
13/16			
27/32			
7/8			
29/32			
15/16			
31/32			

直徑 D in	全長 L mm	溝長 l mm	柄徑 ds mm
1"	140	82	12.7
1-1/32			
1-1/16			
1-3/32			
1-1/8			
1-5/32			
1-3/16			
1-7/32			
1-1/4			
1-9/32			
1-5/16			
1-11/32			
1-3/8			
1-7/16			
1-1/2			

切削條件請參照 P37~40
Cutting data P37~40

斜柄鑽頭

Taper Shank Twist Drills



T-104

- ◎適用於一般鋼料，HRC 30以下之合金鋼、鑄鐵、鑄鋼等被切削材。
- ◎柄部為莫氏圓錐柄，配合導套使用。

- ◎Suitable for drilling General Steels, Alloy Steels with hardness under HRC 30, Cast Iron and Cast Steel, etc.
- ◎Morse taper shank can be fitted into sleeve.

HSS (m/m.) PA118°

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
5.0	140	60	1
5.5	145	65	1
6.0	148	68	1
6.5	152	72	1
7.0	155	75	1
7.5	158	78	1
8.0	162	82	1
8.5	168	85	1
9.0	172	88	1
9.5	175	92	1
10.0	178	95	1
10.5	182	98	1
11.0	182	102	1
11.5	188	105	1
12.0	192	108	1
12.5	195	112	1
13.0	198	115	1
13.5	202	118	1
14.0	205	122	1
14.5	222	122	2
15.0	225	125	2
15.5	228	128	2
16.0	230	130	2
16.5	232	132	2
17.0	235	135	2
17.5	240	140	2
18.0	240	140	2
18.5	245	145	2

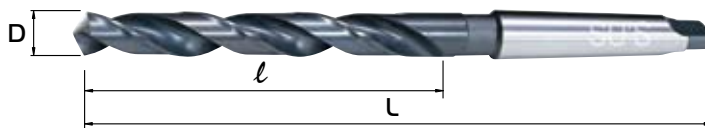
直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
19.0	245	145	2
19.5	250	150	2
20.0	250	150	2
20.5	255	155	2
21.0	255	155	2
21.5	260	160	2
22.0	260	160	2
22.5	265	165	2
23.0	265	165	2
23.5	285	165	3
24.0	285	165	3
24.5	285	165	3
25.0	285	165	3
25.5	285	165	3
26.0	285	165	3
26.5	290	170	3
27.0	290	170	3
27.5	295	175	3
28.0	295	175	3
28.5	300	180	3
29.0	300	180	3
29.5	305	185	3
30.0	305	185	3
30.5	310	190	3
31.0	310	190	3
31.5	315	195	3
32.0	315	195	3
32.5	345	200	4

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
33.0	345	200	4
33.5	350	205	4
34.0	350	205	4
34.5	350	205	4
35.0	350	205	4
35.5	355	210	4
36.0	355	210	4
36.5	355	210	4
37.0	355	210	4
37.5	360	210	4
38.0	360	210	4
38.5	360	210	4
39.0	360	210	4
39.5	365	215	4
40.0	365	215	4
41.0	365	215	4
42.0	370	220	4
43.0	370	220	4
44.0	375	225	4
45.0	375	225	4
46.0	380	230	4
47.0	380	230	4
48.0	385	235	4
49.0	385	235	4
50.0	390	240	4

切削條件請參照 P37-40
Cutting data P37-40

斜柄鑽頭

Taper Shank Twist Drills



T-104

HSS (in./m.m.) PA118°

直徑 D in	全長 L mm	溝長 l mm	MT.NO.
1/2	198	115	1
17/32	202	118	1
9/16	222	122	2
19/32	228	128	2
5/8	230	130	2
21/32	235	135	2
11/16	240	140	2
23/32	245	145	2
3/4	250	150	2
25/32	250	150	2
13/16	255	155	2
27/32	260	160	2
7/8	265	165	2
29/32	285	165	3
15/16	285	165	3
31/32	285	165	3
1"	285	165	3
1-1/32	290	170	3
1-1/16	290	170	3
1-3/32	295	175	3
1-1/8	300	180	3
1-5/32	305	185	3
1-3/16	310	190	3

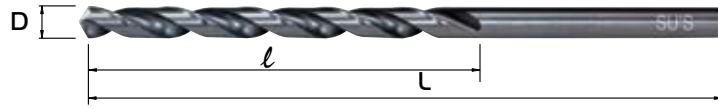
直徑 D mm	全長 L mm	溝長 l mm	IMT.NO.
10.1	182	98	1
10.2	182	98	1
10.3	182	98	1
10.4	182	98	1
10.6	185	102	1
10.7	185	102	1
10.8	185	102	1
10.9	185	102	1
11.1	188	105	1
11.2	188	105	1
11.3	188	105	1
11.4	188	105	1
11.6	192	108	1
11.7	192	108	1
11.8	192	108	1
11.9	192	108	1
12.1	195	112	1
12.2	195	112	1
12.3	195	112	1
12.4	195	112	1
12.6	198	115	1
12.7	198	115	1
12.8	198	115	1
12.9	198	115	1
13.1	202	118	1
13.2	202	118	1
13.3	202	118	1
13.4	202	118	1

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
13.6	205	122	1
13.7	205	122	1
13.8	205	122	1
13.9	205	122	1
14.1	222	122	2
14.2	222	122	2
14.3	222	122	2
14.4	222	122	2
14.6	225	125	2
14.7	225	125	2
14.8	225	125	2
14.9	225	125	2
15.1	228	128	2
15.2	228	128	2
15.3	228	128	2
15.4	228	128	2
15.6	230	130	2
15.7	230	130	2
15.8	230	130	2
15.9	230	130	2
16.1	232	132	2
16.2	232	132	2
16.3	232	132	2
16.4	232	132	2
16.6	235	135	2
16.7	235	135	2
16.8	235	135	2
16.9	235	135	2

切削條件請參照 P37~40
Cutting data P37~40

直柄長鑽頭

Straight Shank Twist Long Drills



L-1210~1230

- ◎適用於一般鋼料，HRC 30以下之合金鋼、鑄鐵、鑄鋼等被切削材。
- ◎適合一般鑽床、車床、桌上車床之鑽孔加工。

- ◎Suitable for drilling General Steels, Alloy Steels with hardness under HRC 30, Cast Iron and Cast Steel, etc.
- ◎Suitable for drilling operations on drilling machines, lathes and bench lathes.

HSS (m/m.) PA118°

直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm
1.0	100	50	2.5	100	50	3.6	200	100	4.6	200	100
1.0	150	75	2.5	150	75	※3.7	100	50	※4.7	100	50
1.1	100	50	2.6	100	50	3.7	150	75	4.7	150	75
1.1	150	75	2.6	150	75	3.7	200	100	4.7	200	100
1.2	100	50	2.7	100	50	※3.8	100	50	※4.8	100	50
1.2	150	75	2.7	150	75	3.8	150	75	4.8	150	75
1.3	100	50	2.8	100	50	3.8	200	100	4.8	200	100
1.3	150	75	2.8	150	75	※3.9	100	50	※4.9	100	50
1.4	100	50	2.9	100	50	3.9	150	75	4.9	150	75
1.4	150	75	2.9	150	75	3.9	200	100	4.9	200	100
1.5	100	50	3.0	100	50	4.0	100	50	※5.0	100	50
1.5	150	75	3.0	150	75	4.0	150	75	5.0	150	75
1.6	100	50	3.0	200	100	4.0	200	100	5.0	200	100
1.6	150	75	3.1	100	50	※4.1	100	50	5.0	250	125
1.7	100	50	3.1	150	75	4.1	150	75	※5.1	100	50
1.7	150	75	3.1	200	100	4.1	200	100	5.1	150	90
1.8	100	50	3.2	100	50	※4.2	100	50	5.1	200	100
1.8	150	75	3.2	150	75	4.2	150	75	※5.2	100	50
1.9	100	50	3.2	200	100	4.2	200	100	5.2	150	90
1.9	150	75	3.3	100	50	※4.3	100	50	5.2	200	100
2.0	100	50	3.3	150	75	4.3	150	75	※5.3	100	50
2.0	150	75	3.3	200	100	4.3	200	100	5.3	150	90
2.1	100	50	3.4	100	50	4.4	100	50	5.3	200	100
2.1	150	75	3.4	150	75	※4.4	150	75	※5.4	100	50
2.2	100	50	3.4	200	100	4.4	200	100	5.4	150	90
2.2	150	75	3.5	100	50	4.5	100	50	5.4	200	100
2.3	100	50	3.5	150	75	4.5	150	75	※5.5	100	50
2.3	150	75	3.5	200	100	4.5	200	100	5.5	150	90
2.4	100	50	※3.6	100	50	※4.6	100	50	5.5	200	100
2.4	150	75	3.6	150	75	4.6	150	75	5.5	250	125

※：無庫存，請另詢

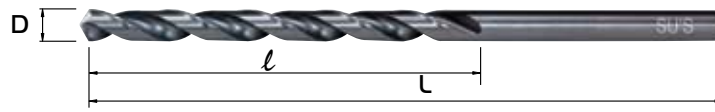
※：None in stock, please contact us

切削條件請參照 P37~40

Cutting data P37~40

直柄長鑽頭

Straight Shank Twist Long Drills



L-1210~1230

高速鋼鑽頭 HSS Drills

HSS (m/m.) PA118°

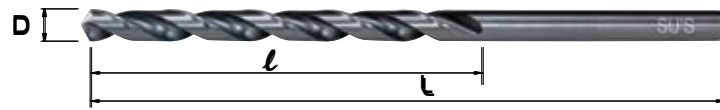
直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm
5.6	150	90	7.0	150	90	7.7	250	150	※8.5	150	90
5.6	200	100	7.0	200	100	7.7	300	175	8.5	200	125
5.7	150	90	7.0	250	125	7.8	150	90	8.5	250	150
5.7	200	100	7.0	300	150	7.8	200	125	8.5	300	175
5.8	150	90	7.1	150	90	7.8	250	150	8.6	200	125
5.8	200	100	7.1	200	100	7.8	300	175	8.6	250	150
5.9	150	90	7.1	250	125	7.9	150	90	8.6	300	175
5.9	200	100	7.1	300	150	7.9	200	125	8.7	200	125
6.0	150	90	7.2	150	90	7.9	250	150	8.7	250	150
6.0	200	100	7.2	200	100	7.9	300	175	8.7	300	175
6.0	250	125	7.2	250	125	8.0	150	90	8.8	200	125
6.1	150	90	7.2	300	150	8.0	200	125	8.8	250	150
6.1	200	100	7.3	150	90	8.0	250	150	8.8	300	175
6.2	150	90	7.3	200	100	8.0	300	175	8.9	200	125
6.2	200	100	7.3	250	125	※8.1	150	90	8.9	250	150
6.3	150	90	7.3	300	150	8.1	200	125	8.9	300	175
6.3	200	100	7.4	150	90	8.1	250	150	9.0	200	125
6.4	150	90	7.4	200	100	8.1	300	175	9.0	250	150
6.4	200	100	7.4	250	125	※8.2	150	90	9.0	300	175
6.5	150	90	7.4	300	150	8.2	200	125	9.1	200	125
6.5	200	100	7.5	150	90	8.2	250	150	9.1	250	150
6.5	250	125	7.5	200	100	8.2	300	175	9.1	300	175
6.6	150	90	7.5	250	125	※8.3	150	90	9.2	200	125
6.6	200	100	7.5	300	150	8.3	200	125	9.2	250	150
6.7	150	90	7.6	150	90	8.3	250	150	9.2	300	175
6.7	200	100	7.6	200	125	8.3	300	175	9.3	200	125
6.8	150	90	7.6	250	150	※8.4	150	90	9.3	250	150
6.8	200	100	7.6	300	175	8.4	200	125	9.3	300	175
6.9	150	90	7.7	150	90	8.4	250	150	9.4	200	125
6.9	200	100	7.7	200	125	8.4	300	175	9.4	250	150

※：無庫存，請另詢
 ※：None in stock, please contact us

切削條件請參照 P37-40
 Cutting data P37-40

直柄長鑽頭

Straight Shank Twist Long Drills



L-1210~1230

HSS (m/m.) PA118°

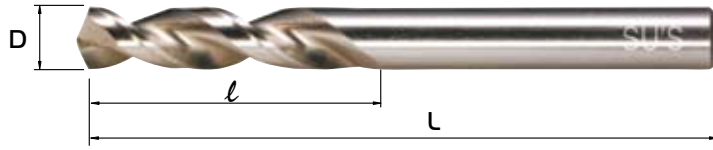
直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm
9.4	300	175	※10.4	300	175	※11.4	300	175	※12.4	300	175
9.5	200	125	10.5	200	125	11.5	200	125	12.5	200	125
9.5	250	150	10.5	250	150	11.5	250	150	12.5	250	150
9.5	300	175	10.5	300	175	11.5	300	175	12.5	300	175
9.6	200	125	※10.6	200	125	※11.6	200	125	※12.6	200	125
9.6	250	150	※10.6	250	150	※11.6	250	150	※12.6	250	150
9.6	300	175	※10.6	300	175	※11.6	300	175	※12.6	300	175
9.7	200	125	※10.7	200	125	※11.7	200	125	※12.7	200	125
9.7	250	150	※10.7	250	150	※11.7	250	150	※12.7	250	150
9.7	300	175	※10.7	300	175	※11.7	300	175	※12.7	300	175
9.8	200	125	※10.8	200	125	※11.8	200	125	※12.8	200	125
9.8	250	150	※10.8	250	150	※11.8	250	150	※12.8	250	150
9.8	300	175	※10.8	300	175	※11.8	300	175	※12.8	300	175
9.9	200	125	※10.9	200	125	※11.9	200	125	※12.9	200	125
9.9	250	150	※10.9	250	150	※11.9	250	150	※12.9	250	150
9.9	300	175	※10.9	300	175	※11.9	300	175	※12.9	300	175
10.0	200	125	11.0	200	125	12.0	200	125	13.0	200	125
10.0	250	150	11.0	250	150	12.0	250	150	13.0	250	150
10.0	300	175	11.0	300	175	12.0	300	175	13.0	300	175
※10.1	200	125	※11.1	200	125	※12.1	200	125			
※10.1	250	150	※11.1	250	150	※12.1	250	150			
※10.1	300	175	※11.1	300	175	※12.1	300	175			
※10.2	200	125	※11.2	200	125	※12.2	200	125			
※10.2	250	150	※11.2	250	150	※12.2	250	150			
※10.2	300	175	※11.2	300	175	※12.2	300	175			
※10.3	200	125	※11.3	200	125	※12.3	200	125			
※10.3	250	150	※11.3	250	150	※12.3	250	150			
※10.3	300	175	※11.3	300	175	※12.3	300	175			
※10.4	200	125	※11.4	200	125	※12.4	200	125			
※10.4	250	150	※11.4	250	150	※12.4	250	150			

※：無庫存，請另詢
 ※：None in stock, please contact us

切削條件請參照 P37~40
 Cutting data P37~40

高速短刃鑽頭

High Speed Stub Drills



DS-105

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎特殊形狀之螺旋溝槽及 "X" 型削薄, 推力小, 排屑佳。
- ◎適用於一般鋼材, 不銹鋼, 鋁合金、鑄鐵等被切削材。

- ◎Basic on HSE features heat and wear resistance .
- ◎Special shapes of helical flutes combined with "X" thinning provide low thrust force and excellent chip removal.
- ◎Suitable for drilling General Steels, Stainless Steel, Aluminum Alloy and Cast Iron, etc.

HSS-CO 8% (m/m.) PA135°

直徑 D mm	全長 L mm	溝長 l mm
1.0	32	8
1.1	32	8
1.2	32	8
1.3	32	8
1.4	32	9
1.5	32	9
1.6	34	10
1.7	34	10
1.8	36	11
1.9	36	11
2.0	38	12
2.1	38	12
2.2	40	13
2.3	40	13
2.4	43	14
2.5	43	14
2.6	43	14
2.7	46	16
2.8	46	16
2.9	46	16
3.0	46	16
3.1	49	18
3.2	49	18
3.3	49	18
3.4	52	20
3.5	52	20
3.6	52	20
3.7	52	20
3.8	55	22
3.9	55	22
4.0	55	22

直徑 D mm	全長 L mm	溝長 l mm
4.1	55	22
4.2	55	22
4.3	58	24
4.4	58	24
4.5	58	24
4.6	58	24
4.7	58	24
4.8	62	26
4.9	62	26
5.0	62	26
5.1	62	26
5.2	62	26
5.3	62	26
5.4	66	28
5.5	66	28
5.6	66	28
5.7	66	28
5.8	66	28
5.9	66	28
6.0	66	28
6.1	70	31
6.2	70	31
6.3	70	31
6.4	70	31
6.5	70	31
6.6	70	31
6.7	70	31
6.8	74	34
6.9	74	34
7.0	74	34
7.1	74	34

直徑 D mm	全長 L mm	溝長 l mm
7.2	74	34
7.3	74	34
7.4	74	34
7.5	74	34
7.6	79	37
7.7	79	37
7.8	79	37
7.9	79	37
8.0	79	37
8.1	79	37
8.2	79	37
8.3	79	37
8.4	79	37
8.5	79	37
8.6	84	40
8.7	84	40
8.8	84	40
8.9	84	40
9.0	84	40
9.1	84	40
9.2	84	40
9.3	84	40
9.4	84	40
9.5	84	40
9.6	89	43
9.7	89	43
9.8	89	43
9.9	89	43
10.0	89	43
10.1	89	43
10.2	89	43

直徑 D mm	全長 L mm	溝長 l mm
10.3	89	43
10.4	89	43
10.5	89	43
10.6	89	43
10.7	95	47
10.8	95	47
10.9	95	47
11.0	95	47
11.1	95	47
11.2	95	47
11.3	95	47
11.4	95	47
11.5	95	47
11.6	95	47
11.7	95	47
11.8	95	47
11.9	95	47
12.0	102	51
12.1	102	51
12.2	102	51
12.3	102	51
12.4	102	51
12.5	102	51
12.6	102	51
12.7	102	51
12.8	102	51
12.9	102	51
13.0	102	51

高速鋼鑽頭 HSS Drills

覆TiAlN高速短刃鑽頭

TiAlN High Speed Stub Drills



DS-106

- ◎使用高鈷材質HSE，具有耐高熱，耐磨耗之特性。
- ◎表面TiAlN膜層HV3000，適合高速度，高進給之切削，縮小加工時間。
- ◎特殊形狀之螺旋溝槽及"X"型削薄，推力小，排屑性好。
- ◎適用於一般鋼材、灰鑄鐵、合金鋼、不銹鋼、鋁合金等被切削材。

- ◎Basic on HSE features heat and wear resistance.
- ◎Surface is coated with TiAlN HV 3000. The drills are ideal for high speed and high feed rate drilling to reduce machining time.
- ◎Special shapes of helical flutes combined with "X" thinning provide low thrust force and excellent chip removal.
- ◎Suitable for drilling General Steels, Grey Cast Iron, Alloy Steel, Stainless Steel and Aluminum Alloy, etc.

HSS-CO 8% (m/m.) PA135°

直徑 D mm	全長 L mm	溝長 l mm
1.0	32	8
1.1	32	8
1.2	32	8
1.3	32	8
1.4	32	9
1.5	32	9
1.6	34	10
1.7	34	10
1.8	36	11
1.9	36	11
2.0	38	12
2.1	38	12
2.2	40	13
2.3	40	13
2.4	43	14
2.5	43	14
2.6	43	14
2.7	46	16
2.8	46	16
2.9	46	16
3.0	46	16
3.1	49	18
3.2	49	18
3.3	49	18
3.4	52	20
3.5	52	20
3.6	52	20
3.7	52	20
3.8	55	22
3.9	55	22
4.0	55	22

直徑 D mm	全長 L mm	溝長 l mm
4.1	55	22
4.2	55	22
4.3	58	24
4.4	58	24
4.5	58	24
4.6	58	24
4.7	58	24
4.8	62	26
4.9	62	26
5.0	62	26
5.1	62	26
5.2	62	26
5.3	62	26
5.4	66	28
5.5	66	28
5.6	66	28
5.7	66	28
5.8	66	28
5.9	66	28
6.0	66	28
6.1	70	31
6.2	70	31
6.3	70	31
6.4	70	31
6.5	70	31
6.6	70	31
6.7	70	31
6.8	74	34
6.9	74	34
7.0	74	34
7.1	74	34

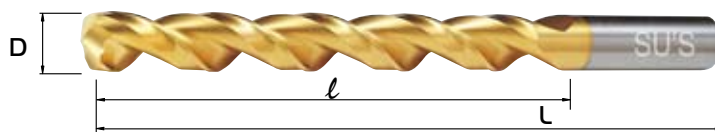
直徑 D mm	全長 L mm	溝長 l mm
7.2	74	34
7.3	74	34
7.4	74	34
7.5	74	34
7.6	79	37
7.7	79	37
7.8	79	37
7.9	79	37
8.0	79	37
8.1	79	37
8.2	79	37
8.3	79	37
8.4	79	37
8.5	79	37
8.6	84	40
8.7	84	40
8.8	84	40
8.9	84	40
9.0	84	40
9.1	84	40
9.2	84	40
9.3	84	40
9.4	84	40
9.5	84	40
9.6	89	43
9.7	89	43
9.8	89	43
9.9	89	43
10.0	89	43
10.1	89	43
10.2	89	43

直徑 D mm	全長 L mm	溝長 l mm
10.3	89	43
10.4	89	43
10.5	89	43
10.6	89	43
10.7	95	47
10.8	95	47
10.9	95	47
11.0	95	47
11.1	95	47
11.2	95	47
11.3	95	47
11.4	95	47
11.5	95	47
11.6	95	47
11.7	95	47
11.8	95	47
11.9	95	47
12.0	102	51
12.1	102	51
12.2	102	51
12.3	102	51
12.4	102	51
12.5	102	51
12.6	102	51
12.7	102	51
12.8	102	51
12.9	102	51
13.0	102	51

切削條件請參照 P34
Cutting data P34

深孔用-強力型直柄鑽頭

Conical Fluted Straight Shank Twist Drills



G-112

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎表面TiN膜層HV2000, 摩擦係數小, 抗粘著, 切削佳。
- ◎心厚大, 使鑽頭更具剛性, 對抗彎曲及振幅, 相對優越。
- ◎特殊形狀之螺旋溝槽, 排屑順暢及 "X" 削薄, 鑿口長度變短, 推力負荷減少, 適合深孔加工, 3倍直徑以上者。
- ◎適用於一般鋼材、合金鋼、鑄鐵等被切削材。

- ◎Basic on HSE features heat and wear resistance.
- ◎Surface is coated with TiN HV2000, featuring low friction coefficient, anti-adhere and superior cutting performance.
- ◎Thick web design provides high rigidity, superior bending-resistance and minimum vibration.
- ◎Special shapes of helical flutes ensure excellent chip removal. "X" thinning reduces length of chisel edge and thrust load.
- ◎The drills are ideal for deep hole drilling with depth over 3 times of drill diameter.
- ◎Suitable for drilling General Steels, Alloy Steel and Cast Iron, etc.

HSS-CO 8% (in. m/m.) PA130°

直徑 D mm	全長 L mm	溝長 l mm
1.0	39	17
1.1	41	19
1.2	41	19
1.3	44	21
1.4	47	22
1.5	47	22
1.6	49	24
1.7	49	24
1.8	51	27
1.9	51	27
2.0	53	27
2.1	53	27
2.2	56	31
2.3	56	31
2.4	59	33
2.5	59	33
2.6	62	35
2.7	62	35
2.8	65	37
2.9	69	40
3.0	69	40
3.1	69	40
3.2	69	40
3.3	71	43
3.4	71	43
3.5	71	43
3.6	74	46
3.7	74	46
3.8	74	46
3.9	77	49
4.0	81	52
4.1	81	52
4.2	81	52
4.3	81	52
4.4	84	54

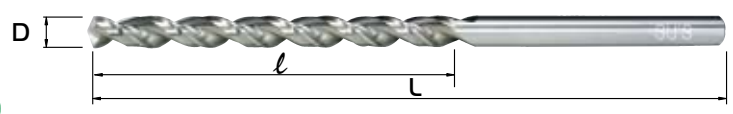
直徑 D mm	全長 L mm	溝長 l mm
4.5	84	54
4.6	84	54
4.7	87	57
4.8	87	57
4.9	90	60
5.0	90	60
5.1	90	60
5.2	92	61
5.3	92	61
5.4	92	61
5.5	92	61
5.6	95	64
5.7	95	64
5.8	95	64
5.9	95	64
6.0	99	67
6.1	99	67
6.2	99	67
6.3	99	67
6.4	102	70
6.5	102	70
6.6	102	70
6.7	102	70
6.8	102	70
6.9	102	70
7.0	102	70
7.1	105	72
7.2	105	72
7.3	105	72
7.4	108	75
7.5	108	75
7.6	108	75
7.7	111	78
7.8	111	78
7.9	111	78

直徑 D mm	全長 L mm	溝長 l mm
8.0	111	78
8.1	115	82
8.2	115	82
8.3	115	82
8.4	119	85
8.5	119	85
8.6	119	85
8.7	119	85
8.8	122	87
8.9	122	87
9.0	122	87
9.1	122	87
9.2	124	89
9.3	124	89
9.4	124	89
9.5	124	89
9.6	127	92
9.7	127	92
9.8	127	92
9.9	127	92
10.0	127	92
10.1	131	96
10.2	131	96
10.3	131	96
10.4	131	96
10.5	135	98
10.6	135	98
10.7	135	98
10.8	138	101
10.9	138	101
11.0	138	101
11.1	138	101
11.2	141	104
11.3	141	104
11.4	141	104

直徑 D mm	全長 L mm	溝長 l mm
11.5	141	104
11.6	144	107
11.7	144	107
11.8	144	107
11.9	144	107
12.0	146	108
12.1	146	108
12.2	146	108
12.3	146	108
12.4	149	111
12.5	149	111
12.6	149	111
12.7	149	111
12.8	149	111
12.9	149	111
13.0	149	111
1/16	49	24
3/32	56	31
1/8	69	40
5/32	77	49
3/16	87	57
7/32	92	61
1/4	99	67
9/32	105	72
5/16	111	78
11/32	119	85
3/8	124	89
13/32	131	96
7/16	138	101
15/32	144	107
1/2	149	111

深孔用-強力型直柄長鑽頭

Conical Fluted Straight Shank Twist Long Drills



K-1310~1330

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎心厚大, 使鑽頭更具剛性, 對抗彎曲及振幅, 相對優越。
- ◎特殊形狀之螺旋溝槽, 排屑順暢及“X”削薄, 鑿口長度變短, 推力負荷減少, 適合深孔加工。
- ◎適用於一般鋼材、灰鑄鐵、合金鋼、鑄鐵、鋁合金等被切削材。

- ◎Basic on HSE features heat and wear resistance .
 - ◎Thick web design provides high rigidity, superior bending-resistance and minimum vibration.
 - ◎Special shapes of helical flutes ensure excellent chip removal. "X" thinning reduces length of chisel edge and thrust load. The drills are ideal for deep hole drilling.
 - ◎Suitable for drilling General Steels, Grey Cast Iron, Alloy Steel, Cast Iron and Aluminum Alloy, etc.
- HSS-CO 8% (m/m.) PA130°

直徑 D mm	全長 L mm	溝長 l mm
1.0	100	50
1.1	100	50
1.2	100	50
1.3	100	50
1.4	100	50
1.5	100	50
1.6	100	50
1.7	100	50
1.8	100	50
1.9	100	50
2.0	100	50
2.1	100	50
2.2	100	50
2.3	100	50
2.4	100	50
2.5	100	50
2.6	100	50
2.7	100	50
2.8	100	50
2.9	100	50
3.0	100	50
3.0	150	75
3.0	200	100
3.1	150	75
3.1	200	100
3.2	150	75
3.2	200	100
3.3	150	75
3.3	200	100
3.4	150	75
3.4	200	100
3.5	150	75
3.5	200	100
3.6	150	75
3.6	200	100
3.7	150	75

直徑 D mm	全長 L mm	溝長 l mm
3.7	200	100
3.8	150	75
3.8	200	100
3.9	150	75
3.9	200	100
4.0	150	75
4.0	200	100
4.1	150	75
4.1	200	100
4.2	150	75
4.2	200	100
4.3	150	75
4.3	200	100
4.4	150	75
4.4	200	100
4.5	150	75
4.5	200	100
4.6	150	75
4.6	200	100
4.7	150	75
4.7	200	100
4.8	150	75
4.8	200	100
4.9	150	75
4.9	200	100
5.0	150	90
5.0	200	100
5.0	250	125
5.1	150	90
5.1	200	100
5.1	250	125
5.2	150	90
5.2	200	100
5.2	250	125
5.3	150	90
5.3	200	100

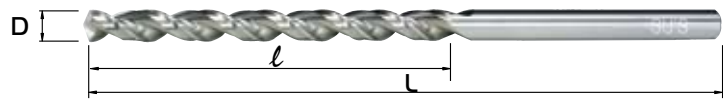
直徑 D mm	全長 L mm	溝長 l mm
5.3	250	125
5.4	150	90
5.4	200	100
5.4	250	125
5.5	150	90
5.5	200	100
5.5	250	125
5.6	150	90
5.6	200	100
5.6	250	125
5.7	150	90
5.7	200	100
5.7	250	125
5.8	150	90
5.8	200	100
5.8	250	125
5.9	150	90
5.9	200	100
5.9	250	125
6.0	150	90
6.0	200	125
6.0	250	150
6.1	150	90
6.1	200	125
6.1	250	150
6.2	150	90
6.2	200	125
6.2	250	150
6.3	150	90
6.3	200	125
6.3	250	150
6.4	150	90
6.4	200	125
6.4	250	150
6.5	150	90
6.5	200	125

直徑 D mm	全長 L mm	溝長 l mm
6.5	250	150
6.6	150	90
6.6	200	125
6.6	250	150
6.7	150	90
6.7	200	125
6.7	250	150
6.8	150	90
6.8	200	125
6.8	250	150
6.9	150	90
6.9	200	125
6.9	250	150
7.0	150	90
7.0	200	125
7.0	250	150
7.0	300	200
7.1	150	90
7.1	200	125
※ 7.1	250	150
※ 7.1	300	200
7.2	150	90
7.2	200	125
※ 7.2	250	150
※ 7.2	300	200
7.3	150	90
7.3	200	125
※ 7.3	250	150
※ 7.3	300	200
7.4	150	90
7.4	200	125
※ 7.4	250	150
※ 7.4	300	200
7.5	150	90
7.5	200	125
7.5	250	150

※：無庫存，請另詢
※：None in stock, please contact us
切削條件請參照 P37~40
Cutting data P37~40

深孔用-強力型直柄長鑽頭

Conical Fluted Straight Shank Twist Long Drills



K-1310~1330

HSS-Co 8% (m/m.) PA130°

高速鋼鑽頭 HSS Drills

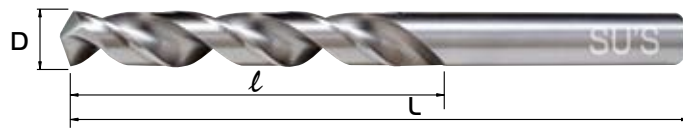
直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm	直徑 D mm	全長 L mm	溝長 l mm
7.5	300	200	8.7	250	150	※ 10.1	300	200	※ 11.6	300	200
7.6	150	90	※ 8.7	300	200	※ 10.2	200	125	※ 11.7	250	150
7.6	200	125	8.8	200	125	※ 10.2	250	150	※ 11.7	300	200
※ 7.6	250	150	※ 8.8	250	150	※ 10.2	300	200	※ 11.8	200	125
※ 7.6	300	200	※ 8.8	300	200	※ 10.3	250	150	※ 11.8	250	150
7.7	150	90	8.9	200	125	※ 10.3	300	200	※ 11.8	300	200
7.7	200	125	※ 8.9	250	150	※ 10.4	200	125	※ 11.9	250	150
7.7	250	150	※ 8.9	300	200	※ 10.4	250	150	※ 11.9	300	200
※ 7.7	300	200	9.0	200	125	※ 10.4	300	200	12.0	200	125
7.8	150	90	9.0	250	150	10.5	200	125	12.0	250	150
7.8	200	125	9.0	300	200	10.5	250	150	12.0	300	200
※ 7.8	250	150	9.1	200	125	10.5	300	200	※ 12.1	250	150
※ 7.8	300	200	9.1	250	150	※ 10.6	200	125	※ 12.1	300	200
7.9	150	90	※ 9.1	300	200	※ 10.6	250	150	※ 12.2	200	125
7.9	200	125	9.2	200	125	※ 10.6	300	200	※ 12.2	250	150
※ 7.9	250	150	※ 9.2	250	150	※ 10.7	250	150	※ 12.2	300	200
※ 7.9	300	200	※ 9.2	300	200	※ 10.7	300	200	※ 12.3	250	150
8.0	150	90	9.3	200	125	※ 10.8	200	125	※ 12.3	300	200
8.0	200	125	※ 9.3	250	150	※ 10.8	250	150	※ 12.4	200	125
8.0	250	150	※ 9.3	300	200	※ 10.8	300	200	※ 12.4	250	150
8.0	300	200	9.4	200	125	※ 10.9	250	150	※ 12.4	300	200
8.1	200	125	※ 9.4	250	150	※ 10.9	300	200	12.5	200	125
8.1	250	150	※ 9.4	300	200	11.0	200	125	12.5	250	150
※ 8.1	300	200	9.5	200	125	11.0	250	150	12.5	300	200
8.2	200	125	9.5	250	150	11.0	300	200	※ 12.6	200	125
8.2	250	150	9.5	300	200	※ 11.1	250	150	※ 12.6	250	150
※ 8.2	300	200	※ 9.6	200	125	※ 11.1	300	200	※ 12.6	300	200
8.3	200	125	※ 9.6	250	150	※ 11.2	200	125	※ 12.7	200	125
※ 8.3	250	150	※ 9.6	300	200	※ 11.2	250	150	※ 12.7	250	150
※ 8.3	300	200	※ 9.7	250	150	※ 11.2	300	200	※ 12.7	300	200
8.4	200	125	※ 9.7	300	200	※ 11.3	250	150	※ 12.8	200	125
※ 8.4	250	150	※ 9.8	200	125	※ 11.3	300	200	※ 12.8	250	150
※ 8.4	300	200	※ 9.8	250	150	※ 11.4	200	125	※ 12.8	300	200
8.5	200	125	※ 9.8	300	200	※ 11.4	250	150	※ 12.9	250	150
8.5	250	150	※ 9.9	250	150	※ 11.4	300	200	※ 12.9	300	200
8.5	300	200	※ 9.9	300	200	11.5	200	125	13.0	200	125
8.6	200	125	10.0	200	125	11.5	250	150	13.0	250	150
※ 8.6	250	150	10.0	250	150	11.5	300	200	13.0	300	200
※ 8.6	300	200	10.0	300	200	※ 11.6	200	125			
8.7	200	125	※ 10.1	250	150	※ 11.6	250	150			

※：無庫存，請另詢
 ※：None in stock, please contact us

切削條件請參照 P37-40
 Cutting data P37-40

不銹鋼用-直柄高鈷鑽頭

Cobalt HSS Straight Shank Twist Drills For Stainless Steel



U-111

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎心厚大, 提高鑽頭剛性, 振幅小。
- ◎"X"削薄, 推力小, 求心性佳, 切削熱擴散容易。
- ◎適用於不銹鋼、鈦合金、耐熱鋼等難切削材。

- ◎Basic on HSE features heat and wear resistance .
- ◎Think web design provides high rigidity and minimum vibration.
- ◎"X" thinning reduces thrust load, accurates concentricity and dissipates heat easily.
- ◎Suitable for drilling tough materials, such as Stainless Steel, Titanium Alloy and Heat-resistant Steel, etc. HSS-CO 8% (in. m/m.) PA130°

直徑 D mm	全長 L mm	溝長 l mm
0.8	33	10
0.85	35	12
0.9	35	12
0.95	39	14
0.98	39	14
1.0	39	14
1.05	41	15
1.1	41	15
1.15	41	15
1.18	41	15
1.2	41	15
1.25	44	16
1.3	44	16
1.35	47	18
1.4	47	18
1.45	47	18
1.5	47	18
1.55	49	19
1.6	49	19
1.65	49	19
1.7	49	19
1.75	51	20
1.8	51	20
1.85	51	20
1.9	51	20
1.95	53	22
2.0	53	22
2.1	53	22
2.2	56	23
2.3	56	23
2.4	59	25
2.5	59	25
2.6	62	27
2.7	62	27
2.8	65	28
2.9	69	34
3.0	69	34
3.1	69	34
3.2	69	34
3.3	71	35
3.4	71	35

直徑 D mm	全長 L mm	溝長 l mm
3.5	71	35
3.6	74	36
3.7	74	36
3.8	74	36
3.9	77	38
4.0	81	42
4.1	81	42
4.2	81	42
4.3	81	42
4.4	84	44
4.5	84	44
4.6	84	44
4.7	87	45
4.8	87	45
4.9	90	49
5.0	90	49
5.1	90	49
5.2	92	49
5.3	92	49
5.4	92	49
5.5	92	49
5.6	95	51
5.7	95	51
5.8	95	51
5.9	95	51
6.0	99	54
6.1	99	54
6.2	99	54
6.3	99	54
6.4	102	56
6.5	102	56
6.6	102	56
6.7	102	56
6.8	102	56
6.9	102	56
7.0	102	56
7.1	105	59
7.2	105	59
7.3	105	59
7.4	108	61
7.5	108	61

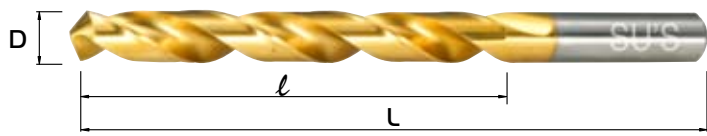
直徑 D mm	全長 L mm	溝長 l mm
7.6	108	61
7.7	111	63
7.8	111	63
7.9	111	63
8.0	111	63
8.1	115	65
8.2	115	65
8.3	115	65
8.4	119	68
8.5	119	68
8.6	119	68
8.7	119	68
8.8	122	70
8.9	122	70
9.0	122	70
9.1	122	70
9.2	124	70
9.3	124	70
9.4	124	70
9.5	124	70
9.6	127	72
9.7	127	72
9.8	127	72
9.9	127	72
10.0	127	72
10.1	131	77
10.2	131	77
10.3	131	77
10.4	131	77
10.5	135	81
10.6	135	81
10.7	135	81
10.8	138	83
10.9	138	83
11.0	138	83
11.1	138	83
11.2	141	85
11.3	141	85
11.4	141	85
11.5	141	85
11.6	144	85

直徑 D mm	全長 L mm	溝長 l mm
11.7	144	85
11.8	144	85
11.9	144	85
12.0	146	87
12.1	146	87
12.2	146	87
12.3	146	87
12.4	149	89
12.5	149	89
12.6	149	89
12.7	149	89
12.8	149	89
12.9	149	89
13.0	149	89
1/16	49	19
5/64	53	22
3/32	56	23
7/64	65	28
1/8	69	34
9/64	74	36
5/32	77	38
11/64	84	44
3/16	87	45
13/64	92	49
7/32	92	49
15/64	99	54
1/4	99	54
17/64	102	56
9/32	105	59
5/16	111	63
11/32	119	68
3/8	124	70
13/32	131	77
7/16	138	83
15/32	144	87
1/2	149	89

切削條件請參照 P37-40
Cutting data P37-40

氮化鈦-直柄麻花鑽頭

TiN Coated Straight Shank Twist Drills



I-113

- ◎表面TiN膜層HV2000，具耐磨性，摩擦係數小，抗粘著，切削性佳，可延長壽命約3倍。
- ◎在一定的進刀量時，切削速度可提高30%。
- ◎適用於一般鋼材、合金鋼、調質鋼、鋁合金、鑄鐵等被切削材。

- ◎Surface is coated with TiN HV2000, featuring maximum wear-resistance, low friction-coefficient, anti-adhere, superior cutting performance and service life extended to 3 times.
- ◎Drilling speed is increased by 30% at a constant feed rate.
- ◎Suitable for drilling General Steels, Alloy Steel, Tempered Steel, Aluminum Alloy and Cast Iron, etc.

HSS (in. m/m.) PA118°

直徑 D mm	全長 L mm	溝長 l mm
1.0	40	18
1.1	42	20
1.2	42	20
1.3	45	22
1.4	48	23
1.5	48	23
1.6	50	25
1.7	50	25
1.8	52	28
1.9	52	28
2.0	55	29
2.1	55	29
2.2	58	33
2.3	58	33
2.4	61	35
2.5	61	35
2.6	64	37
2.7	64	37
2.8	67	39
2.9	71	42
3.0	71	42
3.1	71	42
3.2	71	42
3.3	73	45
3.4	73	45
3.5	73	45
3.6	76	48
3.7	76	48
3.8	76	48
3.9	79	51
4.0	83	54
4.1	83	54
4.2	83	54
4.3	83	54
4.4	86	56
4.5	86	56
4.6	86	56
4.7	89	59
4.8	89	59
4.9	92	62
5.0	92	62
5.1	92	62
5.2	95	64
5.3	95	64
5.4	95	64

直徑 D mm	全長 L mm	溝長 l mm
5.5	95	64
5.6	98	67
5.7	98	67
5.8	98	67
5.9	98	67
6.0	102	70
6.1	102	70
6.2	102	70
6.3	102	70
6.4	105	73
6.5	105	73
6.6	105	73
6.7	105	73
6.8	105	73
6.9	105	73
7.0	105	73
7.1	108	75
7.2	108	75
7.3	108	75
7.4	111	78
7.5	111	78
7.6	111	78
7.7	114	81
7.8	114	81
7.9	114	81
8.0	114	81
8.1	117	84
8.2	117	84
8.3	117	84
8.4	121	87
8.5	121	87
8.6	121	87
8.7	121	87
8.8	124	89
8.9	124	89
9.0	124	89
9.1	124	89
9.2	127	92
9.3	127	92
9.4	127	92
9.5	127	92
9.6	130	95
9.7	130	95
9.8	130	95
9.9	130	95

直徑 D mm	全長 L mm	溝長 l mm
10.0	130	95
10.1	133	98
10.2	133	98
10.3	133	98
10.4	133	98
10.5	137	100
10.6	137	100
10.7	137	100
10.8	140	103
10.9	140	103
11.0	140	103
11.1	140	103
11.2	143	106
11.3	143	106
11.4	143	106
11.5	143	106
11.6	146	109
11.7	146	109
11.8	146	109
11.9	146	109
12.0	146	111
12.1	149	111
12.2	149	111
12.3	149	111
12.4	152	114
12.5	152	114
12.6	152	114
12.7	152	114
12.8	152	114
12.9	152	114
13.0	152	114

直徑 D mm	全長 L mm	溝長 l mm
3/64	42	20
1/16	48	23
5/64	52	28
3/32	58	33
7/64	67	39
1/8	71	42
9/64	73	45
5/32	79	51
11/64	83	54
3/16	89	59
13/64	92	62
7/32	95	64
15/64	98	67
1/4	102	70
17/64	105	73
9/32	108	75
19/64	111	78
5/16	114	81
21/64	117	84
11/32	121	87
23/64	124	89
3/8	127	92
25/64	130	95
13/32	133	98
27/64	137	100
7/16	140	103
29/64	143	106
15/32	146	109
31/64	149	111
1/2	152	114

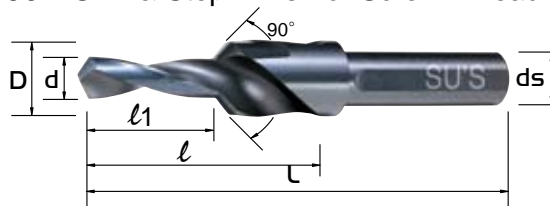
切削條件請參照 P37-40
Cutting data P37-40

沈頭鑽頭

Sink & Step Drills For Screw Thread

90° 沈頭鑽頭

90° Sink & Step Drills For Screw Thread



M-118

- ◎依據一般螺絲及六角螺絲專用之孔作業而設計的鑽頭。
- ◎原需兩次加工作業，縮為一次完成，同心度佳。

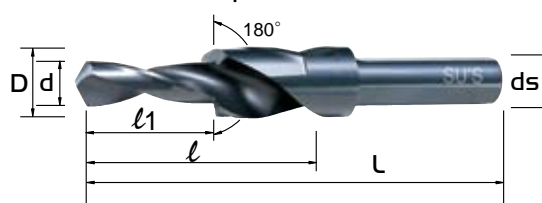
- ◎Specially designed drills that are suitable for drilling holes for general screws and hexagonal head screws.
- ◎Allow for two machining processes accomplished by one process, and provide superior concentricity.

HSS (m/m.)

規格	小徑 d mm	大徑 D mm	全長 L mm	刃長 l mm	小徑長 l1 mm	柄徑 ds mm
M3	3.4	6.4	65	35	13	6.4
M4	4.5	8.4	75	42	18	8.4
M5	5.5	10.4	85	50	22	10.4
M6	6.6	12.5	90	51	25	12.0
M8	9.0	16.5	95	53	28	12.0

180° 沈頭鑽頭

180° Sink & Step Drills For Screw Thread



M-119

- ◎依據一般螺絲及六角螺絲專用之孔作業而設計的鑽頭。
- ◎原需兩次加工作業，縮為一次完成，同心度佳。

- ◎Specially designed drills that are suitable for drilling holes for general screws and hexagonal head screws.
- ◎Allow for two machining processes accomplished by one process, and provide superior concentricity.

HSS (m/m.)

規格	小徑 d mm	大徑 D mm	全長 L mm	刃長 l mm	小徑長 l1 mm	柄徑 ds mm
M3	3.4	6.5	65	35	13	6.5
M4	4.5	8.0	75	42	18	8.0
M5	5.5	9.5	85	50	22	9.5
M6	6.6	11.0	90	53	25	11.0
M8	9.0	14.0	95	53	28	12.0
M10	11.0	17.5	105	63	30	12.0
M12	14.0	20.0	110	68	32	12.0
1/4	6.9	11.0	90	53	25	11.0
5/16	8.9	14.0	95	53	28	12.0
3/8	10.5	15.0	105	63	30	12.0
1/2	14.7	20.0	110	68	32	12.0

NC定點鑽頭

NC Spotting Drills



P-115/116

- ◎使用HSS-CO材質，具有耐高溫，耐磨耗之特性。
- ◎表面TiN膜層HV2000，具耐磨性，摩擦係數小，抗粘著，切削性佳，可延長壽命。
- ◎正確定點及倒角一次完成，提升加工層次。
- ◎適用於一般鋼料、合金鋼、調質鋼、鑄鐵、鋁合金等被削材。

- ◎Basic on HSS-CO features heat and wear resistance.
- ◎Surface is coated with TiN HV2000, featuring maximum wear-resistance, low friction-coefficient, anti-adhere, superior cutting performance and long service life.
- ◎Precise position and chamfer are accomplished at one time to improve machining quality.
- ◎Suitable for drilling General Steels, Alloy Steel, Tempered Steel, Cast Iron and Aluminum Alloy, etc.

HSS-CO 5%+TiN (m/m.)

直徑 D mm	全長 L mm	溝長 l mm
3.0	50	17
4.0	55	20
5.0	60	23
6.0	65	25
8.0	80	30

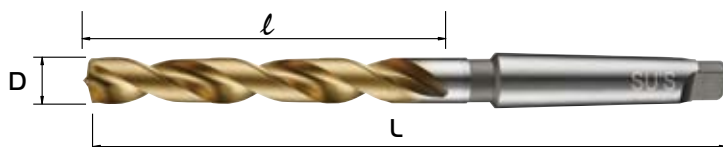
直徑 D mm	全長 L mm	溝長 l mm
10.0	90	35
12.0	100	40
16.0	115	45
20.0	130	55
25.0	150	65

- ◆ 正確的定點提昇您加工的質量。
Precise positioning improves processing quality.
- ◆ 含鈷高速鋼(HSS-CO)材質。
The material is HSS-CO 5%.

- ◆ 在鑽孔時鑽頭尖端先接觸定點的位置，所鑽出的孔真直度佳，且不易崩刃，壽命增長。
Positioning first before drilling. The holes will be straight and the tool life will be longer.
- ◆ 在圓弧面或小斜度面加工，使用定點鑽頭很容易掌握中心孔的位置。
Easily get the center by using NC Spotting Drills when process on an arc surface or an inclined plane.

鋼構用斜柄鑽頭

Taper Shank Drills For Iron Frames



TP-152

- ◎螺旋角35° 及尖端角度160° + 100° 之設計，為減低軸向推力及提高加工的精度，且出孔無毛邊。
- ◎表面TiN膜層HV2000，具耐磨性，摩擦係數小，抗粘著，切削性佳，增長壽命。
- ◎最適用於H型鋼之結構用鋼的鑽孔加工。

- ◎35° helix angle combined with 160° +100° point angle design reduces axial thrust while upgrading machining accuracy without burrs on hole edge.
- ◎Surface is coated with TiN HV2000, featuring maximum wear-resistance, low friction-coefficient, anti-adhere, superior cutting performance and long service life.
- ◎Especially ideal for drilling holes on H Beam Structural Steel.

(m/m.)

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
17.5	260	140	3
18.0	260	140	3
18.5	265	145	3
19.0	265	145	3
19.5	270	150	3
20.0	270	150	3
20.5	275	155	3
21.0	275	155	3
21.5	280	160	3
22.0	280	160	3

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
22.5	285	165	3
23.0	285	165	3
23.5	285	165	3
24.0	285	165	3
24.5	285	165	3
25.0	285	165	3
25.5	285	165	3
26.0	285	165	3
26.5	285	165	3
27.0	285	165	3

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
27.5	285	165	3
28.0	285	165	3
28.5	285	165	3
29.0	285	165	3
29.5	285	165	3
30.0	285	165	3
30.5	285	165	3
31.0	285	165	3
31.5	285	165	3
32.0	285	165	3

26.5mm以上尖端角度為130°
For over 26.5mm the point angle is 130°

切削條件請參照 P36
Cutting data P36

高鈷鑽頭

斜柄高鈷鑽頭

Cobalt Drills

Taper Shank HSS Cobalt Drills

2T71



- ◎使用HSS-CO材質，具有耐高溫，耐磨耗之特性。
- ◎使用於耐熱鋼、不銹鋼、合金鋼及HRC 28以上之難切削材料。

- ◎Basic on HSS-CO features heat and wear resistance.
- ◎Suitable for drilling tough materials, such as Heat-Resistant Steel, Stainless Steel, Alloy Steel and Steel with hardness over HRC 28.

HSS-CO 5% (m/m.) PA125°

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
13.5	202	118	1
14.0	205	122	1
14.5	222	122	2
15.0	225	125	2
15.5	228	128	2
16.0	230	130	2
16.5	232	132	2
17.0	235	135	2
17.5	240	140	2
18.0	240	140	2
18.5	245	145	2
19.0	245	145	2

直徑 D mm	全長 L mm	溝長 l mm	MT.NO.
19.5	250	150	2
20.0	250	150	2
20.5	255	155	2
21.0	255	155	2
21.5	260	160	2
22.0	260	160	2
23.0	265	165	2
24.0	285	165	3
25.0	285	165	3
26.0	285	165	3
27.0	290	170	3
28.0	295	175	3

切削條件請參照 P37-40
Cutting data P37-40

諾氏高鈷鑽頭

Noss HSS Cobalt Drills



2N71

- ◎適用HSS-CO材質，具有耐高溫，耐磨耗之特性。
- ◎適用於耐熱鋼、不銹鋼、合金鋼及HRC 28以上之難切削材料。

- ◎HSS-CO heat-resistance and wear-resistance.
- ◎Suitable for drilling tough materials, such as Heat-Resistant Steel, Stainless Steel, Alloy Steel and Steel with hardness over HRC 28.

HSS-CO 5% (m/m.) PA125°

直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
13.5	140	82	12.7
14.0			
14.5			
15.0			
15.5			
16.0			
16.5			
17.0			
17.5			
18.0			

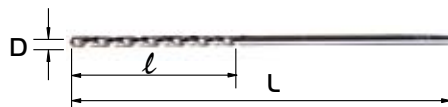
直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
18.5	140	82	12.7
19.0			
19.5			
20.0			
20.5			
21.0			
21.5			
22.0			
23.0			
24.0			

直徑 D mm	全長 L mm	溝長 l mm	柄徑 ds mm
25.0	140	82	12.7
26.0			
17/32			
9/16			
5/8			
11/16			
3/4			

切削條件請參照 P37-40
Cutting data P37-40

小徑鑽頭

Small Diameter Drills



不銹鋼錶帶專用小徑鑽頭

Cobalt Drills For Watchstrap

U-111

◎適用於合金工具鋼、不銹鋼之錶帶加工作業。

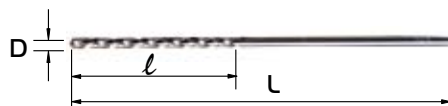
◎Suitable for drilling Alloy Tool Steel and Stainless Steel watchstraps.

HSS-CO 8% (m/m.) PA130°

直徑 D mm	全長 L mm	溝長 l mm
0.8	33	12
0.85	35	12
0.9	35	12
0.95	39	14
0.98	39	14
1.0	39	14
1.05	41	15
1.1	41	15
1.15	41	15

直徑 D mm	全長 L mm	溝長 l mm
1.18	41	15
1.2	41	15
1.25	44	16
1.3	44	16
1.35	47	18
1.4	47	18
1.45	47	18
1.5	47	18
1.55	49	19

直徑 D mm	全長 L mm	溝長 l mm
1.6	49	19
1.65	49	19
1.7	49	19
1.75	51	20
1.8	51	20
1.9	51	20
2.0	53	22



一般錶帶專用小徑鑽頭

HSS Drills For Watchstrap (Fast Helix)

UD-151

◎適用於合金工具鋼、不銹鋼之錶帶加工作業。

◎Suitable for drilling Alloy Tool Steel and Stainless Steel watchstraps.

HSS (m/m.) PA:130°

直徑 D mm	全長 L mm	溝長 l mm
0.8	34	11
0.85	36	13
0.9	36	13
0.95	40	18
0.98	40	18
1.0	40	18
1.05	42	20
1.1	42	20
1.15	42	20

直徑 D mm	全長 L mm	溝長 l mm
1.18	42	20
1.2	42	20
1.25	45	22
1.3	45	22
1.35	48	23
1.4	48	23
1.45	48	23
1.5	48	23
1.55	50	25

直徑 D mm	全長 L mm	溝長 l mm
1.6	50	25
1.65	50	25
1.7	50	25
1.75	52	28
1.8	52	28
1.85	52	28
1.9	52	28
1.95	52	28
2.0	55	29

左旋鑽頭

Left Hand Helix Straight Shank HSE Twist Drills

短刃型 Stub Flute



LD-154

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎使用於抗拉強度1000N/mm (HRC 32)之鋼材、不銹鋼、鑄鐵等加工。
- ◎Basic on HSE features heat and wear resistance.
- ◎Suitable for drilling various steels with tensile strength up to 1000 N/mm (HRC 32), Stainless Steel and Cast Iron, etc.

HSS-CO 8% PA130°

直徑 D mm	全長 L mm	溝長 l mm
1.80	36	11
1.82	36	11
2.30	40	13
2.40	43	14
2.55	43	14
2.75	46	16
2.78	46	16
3.15	49	18
3.16	49	18
3.17	49	18
3.18	49	18
3.65	52	20
3.68	52	20
※ 3.8-4.0	55	22
※ 4.1-4.2	55	22
※ 4.3-4.5	58	24
※ 4.6-4.7	58	24
※ 4.8-5.0	62	26
※ 5.05-5.3	62	26
※ 5.4-5.6	66	28

長刃型 Long Flute



LD-155

- ◎使用高鈷材質HSE, 具有耐高熱, 耐磨耗之特性。
- ◎使用於抗拉強度1000N/mm (HRC 32)之鋼材、不銹鋼、鑄鐵等加工。
- ◎Basic on HSE features heat and wear resistance.
- ◎Suitable for drilling various steels with tensile strength up to 1000 N/mm (HRC 32), Stainless Steel and Cast Iron, etc.

HSS-CO 8% PA130°

直徑 D mm	全長 L mm	溝長 l mm
1.80	46	22
1.82	46	22
2.30	53	27
2.40	57	30
2.55	57	30
2.75	61	33
2.78	61	33
3.15	65	36
3.16	65	36
3.17	65	36
3.18	65	36
3.65	70	39
3.68	70	39
※ 3.8-4.0	75	43
※ 4.1-4.2	75	43
※ 4.3-4.5	80	47
※ 4.6-4.7	80	47
※ 4.8-5.0	86	52
※ 5.05-5.3	86	52
※ 5.4-5.6	93	57

※：表示為訂製品

※：Means made to order
未於上述規格，請另詢※：None in stock, please
contact us.

◆適用於自動車床。

Suitable for use on automatic lathes.

◆寬滑的溝槽、高螺旋的導角，可使切削冷卻液充分供應至鑽刃，降低切削產生之高熱度，減少黏屑與附着刃的產生，防止塑性變形。

Wide chip space and high helix angle help coolant fluids reach to the cutting edge, reduce heat and built-up edge, and prevent deformation.

◆可廣泛適用於抗張強度達1000N/mm²等鋼材、不銹鋼、鑄鐵等加工。Suitable for steel which tensile strength approx. 1000N/mm², Stainless Steel and Cast Iron.

◆適用於直徑3倍以上的深孔加工。

Suitable for drilling depth up to 3 x D.

◆不建議使用在鎳鉻或類似的鋼材。

Not recommend to be used on Nickel-Chrome Steel and similar materials.

高速短刃鑽頭切削條件

Cutting Conditions Of High Speed Stub Drills

切削條件表 Table Of Drilling Conditions

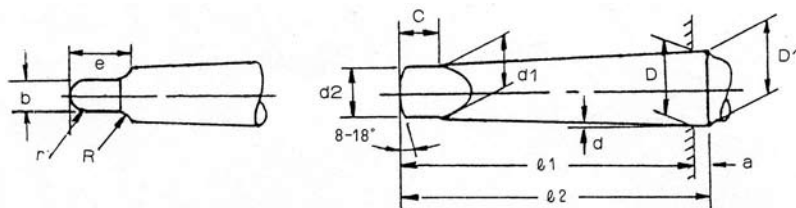
被削材 Work Material	一般鋼,鑄鐵 SS400,S45C,FC (~25 HRC)		合金鋼 SCM.SK (25~35 HRC)		合金鋼 SCM.SK (35~40 HRC)		不銹鋼 SUS 304,316		銅合金 Copper Alloy		鋁合金 Aluminum Alloy	
	直徑(mm) Diameter	回轉數 R.P.M.	進刀量 mm/rev	回轉數 R.P.M.	進刀量 mm/rev	回轉數 R.P.M.	進刀量 mm/rev	回轉數 R.P.M.	進刀量 mm/rev	回轉數 R.P.M.	進刀量 mm/rev	回轉數 R.P.M.
1.0	10,000	0.05	8,500	0.04	6,300	0.03	5,400	0.04	8,500	0.05	18,000	0.06
2.0	5,500	0.09	4,500	0.06	3,200	0.04	2,700	0.06	4,500	0.09	9,000	0.09
3.0	3,700	0.13	2,800	0.08	2,100	0.06	1,800	0.08	2,800	0.13	6,000	0.13
4.0	2,800	0.15	2,200	0.10	1,600	0.08	1,350	0.10	2,200	0.15	4,500	0.15
5.0	2,200	0.18	1,800	0.12	1,270	0.10	1,080	0.12	1,800	0.18	3,600	0.18
6.0	1,800	0.19	1,400	0.15	1,060	0.13	900	0.15	1,400	0.19	3,000	0.20
8.0	1,400	0.20	1,100	0.19	800	0.16	680	0.19	1,100	0.20	2,300	0.26
10.0	1,100	0.22	900	0.21	640	0.18	540	0.21	900	0.22	1,800	0.32
12.0	930	0.25	710	0.23	530	0.22	450	0.23	710	0.25	1,400	0.36
13.0	860	0.26	660	0.25	490	0.23	420	0.25	660	0.26	1,300	0.38

註：請加入足夠之切削油。使用非水溶性切削油時，請將回轉數降下使用。
 深孔加工時，請參考附表之減少率，將切削條件斟酌的調降。
 Remarks: Add enough cutting fluids during drilling. Reduce the rpm., if using non-water soluble oil.
 Please also refer to the table to reduce the rpm. and rev. in deep-hole drilling.

- ◆高鈷材質鍍TiAlN，具有耐高溫及耐磨耗的特性。
HSE material with TiAlN coated is heat and wear resistance.
- ◆高速度、高進刀量鑽孔，快速縮短加工時間。
Shorten machining time with high speed and high feed rate.
- ◆鑽頭尖端角度及螺旋形狀設計，定點精確，斷屑效果好。
Point angle and twist structure are designed for precise positioning and efficient chip breaking.
- ◆適用於中心加工機到一般鑽床，用途廣泛。
Suitable for machines center even general drilling machines, is all-purpose.
- ◆鑽頭壽命為一般泛用品的3倍以上，快速縮短加工時間。
Triple drill life of general, save machining time.

莫氏圓錐柄規格

Morse NO. Of Taper Shank



莫氏錐度 號碼 Morse Taper NO.	錐度 Taper		角度 Angle α	錐度部份 Taper Section						榫舌部份 Tong					
				D	a	D ₁ (約) (Approx.)	d ₁ (約) (Approx.)	l ₁ (最大) (Max.)	l ₂ (最大) (Max.)	d ₂ (最大) (Max.)	b	c (最大) (Max.)	l (最大) (Max.)	R	γ
0	$\frac{1}{19.212}$	0.05205	1° 29'27"	9.045	3	9.2	6.1	56.5	59.5	6.0	3.9	6.5	10.5	4	1
1	$\frac{1}{20.047}$	0.04988	1° 25'43"	12.065	3.5	12.2	9.0	62.0	65.5	8.7	5.2	8.5	13.5	5	1.2
2	$\frac{1}{20.02}$	0.04995	1° 25'50"	17.780	5	18.0	14.0	75.0	80.0	13.5	6.3	10	16	6	1.6
3	$\frac{1}{19.922}$	0.05020	1° 26'16"	23.825	5	24.1	19.1	94.0	99.0	18.5	7.9	13	20	7	2
4	$\frac{1}{19.254}$	0.05194	1° 29'15"	31.267	6.5	31.6	25.2	117.5	124.0	24.5	11.9	16	24	8	2.5
5	$\frac{1}{19.002}$	0.05263	1° 29'26"	44.399	6.5	44.7	36.5	149.5	156.0	35.7	15.9	19	29	10	3
6	$\frac{1}{19.180}$	0.05214	1° 29'36"	63.348	8	63.8	52.4	210.0	278.0	51.0	19	27	40	13	4
7	$\frac{1}{19.231}$	0.05200	1° 29'22"	83.058	10	83.6	68.2	286.0	296.0	66.8	28.6	35	54	19	5

【公差極限】 Tolerance

直徑(MM) Diameter		h6 (MM)		h7 (MM)		h8 (MM)		h9 (MM)	
大於/等於 Over/Include	小於 Under	上限(+) Top Limit	下限(-) Bottom Limit	上限(+) Top Limit	下限(-) Bottom Limit	上限(+) Top Limit	下限(-) Bottom Limit	上限(+) Top Limit	下限(-) Bottom Limit
	3	0	0.006	0	0.010	0	0.014	0	0.025
3	6	0	0.008	0	0.012	0	0.018	0	0.030
6	10	0	0.009	0	0.015	0	0.022	0	0.036
10	18	0	0.011	0	0.018	0	0.027	0	0.043
18	30	0	0.013	0	0.021	0	0.033	0	0.052
30	50	0	0.016	0	0.025	0	0.039	0	0.062
50	80	0	0.019	0	0.030	0	0.046	0	0.074
80	120	0	0.022	0	0.035	0	0.054	0	0.087
120	180	0	0.025	0	0.040	0	0.063	0	0.100
180	250	0	0.029	0	0.046	0	0.072	0	0.115

鋼構用斜柄鑽頭切削條件

Drilling Conditions Of Drills For Iron Frames

切削條件基準表 *Table of Drilling Conditions*

被切削材質 Work Material	一般構造用鋼 Structural Steels SS400		高張力溶接構造用鋼 High Tensile Strength Welding Structural Steels SM490		高張力鋼 High Tensile Structural Steels SM570	
切削速度 Cutting Speed	25~32m/min		18~25m/min		14~20m/min	
直徑 (mm)	回轉速度 (min ⁻¹ /rpm)	進刀速度 (mm/rev)	回轉速度 (min ⁻¹ /rpm)	進刀速度 (mm/rev)	回轉速度 (min ⁻¹ /rpm)	進刀速度 (mm/rev)
18	550	0.27~0.36	350	0.27~0.36	320	0.27~0.32
20	500	0.30~0.40	320	0.30~0.40	280	0.30~0.36
22	450	0.33~0.44	280	0.33~0.44	260	0.33~0.40
24	400	0.35~0.48	260	0.35~0.48	240	0.35~0.43
26	380	0.36~0.52	240	0.36~0.52	220	0.36~0.46
32	310	0.38~0.54	200	0.38~0.54	180	0.38~0.48

- ◆採用低震動式的刃口設計，穿孔平順，最適用於H型鋼等結構鋼鑽孔加工用。
Low shock design cutting edge, smooth drilling, is suitable for drilling on H Beam rolled steel.
- ◆螺旋35° 強導角與溝形，減低軸向推力，幫助排屑與切削油的浸透。
35° angle and twist structure reduce axial thrust, which help chip flow and cutting fluids reach to the edge.
- ◆特殊的尖端角，較低的進給速率，可壓抑毛邊的產生，得到加工孔的精度。
Special point angle and low feed rate reduce burrs and get accurate drilling.
- ◆覆TiN，使表面硬度高、光滑，降低摩擦係數，增加排屑能力，刀具使用壽命長。
TiN coated harden and polish tool surface, which reduce friction coefficient, increase chip flow and tool life.

HSS 鑽頭之切削條件選擇表 - I

Cutting Conditions Selecting Table-I For HSS Drills

表中：上值為回轉速 N (rpm)
下值為進給 f (mm/rev)

切削條件表

Table of Drilling Conditions

The upper data is rotation speed N (R.P.M.)
The lower data is feed speed f (mm/rev)

被削材 Work Material		鑽頭直徑 D (mm)														鑽頭 材質 Drill Mat'l
材質 Material	抗拉力 Tensile Strength N/mm ²	切削速度 Cutting Speed M/Min	1	2	3	4	5	6	7	8	9	10	12	16	20	
一般構造用鋼 General Structural Steel																
SS34, SS41	300-500	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
SS50	500-800	25	8000	4000	2650	2000	1600	1330	1140	1000	880	660	660	500	400	HSS
			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
快削鋼 Fast Cut Steel																
SUM21, SUM22L	360-550	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	
SUM32	600-850	25	8000	4000	2650	2000	1600	1330	1140	1000	880	800	660	500	400	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
彈簧鋼 Spring Steel																
SUP3, SUP10	HB240-330	4	1280~	640~	420~	320~	160~	210~	180~	160~	140~	130~	105~	80~	65~	HS Co
SUP12			3200	1600	1070	800	640	530	460	400	360	320	270	200	160	
			0.013	0.025	0.038	0.050	0.050	0.060	0.070	0.080	0.090	0.100	0.100	0.125	0.160	
碳鋼 Carbon Steel																
S10C-S20C	340-600	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
S35C-S45C	600-800	20	6400	3200	2120	1600	1280	1060	910	800	710	640	530	400	320	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
S50C-S58C	800-1000	16	5000	2500	1700	1250	1020	850	730	630	570	510	430	320	260	HSS
			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
合金鋼 Alloy Steel																
SCr415 SCr420 SCr435 SCr440 SCM440	500-800	16	5000	2500	1700	1250	1020	850	730	630	570	510	430	320	260	HSS
			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
SCM430 SCM445	600-900	16	5000	2500	1700	1250	1020	850	730	630	570	510	430	320	260	HSS
			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
SNM420	900-1200	10	3200	1600	1070	800	640	530	460	400	360	320	270	200	160	HS Co
SNM439			0.013	0.025	0.038	0.050	0.050	0.060	0.070	0.080	0.090	0.100	0.100	0.125	0.160	

HSS鑽頭之切削條件選擇表 - II

Cutting Conditions Selecting Table-II For HSS Drills

表中：上值為回轉速 N (rpm)
下值為進給 f (mm/rev)

切削條件表 *Table of Drilling Conditions*

The upper data is rotation speed N (R.P.M.)
The lower data is feed speed f (mm/rev)

被削材 Work Material		鑽頭直徑 D (mm)														鑽頭 材質 Drill Mat'l
材質 Material	抗拉力 Tensile Strength N/mm ²	切削速度 Cutting Speed M/Min	1	2	3	4	5	6	7	8	9	10	12	16	20	
軸承鋼 Bearing Steel	750-850	16	5000	2500	1700	1250	1020	850	730	630	570	510	430	320	260	HS Co
SUJ1,SUJ2,SUJ3			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
合金工具鋼 Alloy Tool Steel	800-1000	10	3200	1600	1070	800	640	530	460	400	360	320	270	200	160	HS Co
SKD11 SKD12			0.016	0.032	0.038	0.063	0.063	0.075	0.100	0.100	0.113	0.125	0.125	0.160	0.200	
SKD4 SKD6																
SKD2 SKS3 SKT5																
SKD61 SKD62	700-850	16	5000	2500	1700	1250	1020	850	630	630	570	510	430	320	260	HS Co
SKS7 SKS21			0.016	0.032	0.038	0.063	0.063	0.075	0.100	0.100	0.113	0.125	0.125	0.160	0.200	
SKS41 SKS42																
高速工具鋼 High Speed Tool Steel	900-1050	10	3200	1600	1070	800	640	500	460	400	360	320	270	200	160	HS Co
SKH51 SKH55			0.013	0.025	0.038	0.050	0.050	0.060	0.070	0.080	0.090	0.100	0.100	0.125	0.160	
SKH57																
不銹鋼 Stainless Steel	500-900	12	3800	1900	1270	960	760	630	540	480	420	380	320	210	190	HS Co
SUS410, SUS405			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
SUS420, SUS430																
SUS430F																
SUS303, SUS304	500-750	10	3200	1600	1070	800	640	530	460	400	360	320	270	200	160	HS Co
SUS316,			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
SUS316 T1																
耐熱鋼 Heat-resistant Steel	500-800	6	1920	960	640	480	380	320	270	240	210	190	160	120	95	HS Co
SUH660			0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090	0.100	0.100	0.125	0.160	

HSS 鑽頭之切削條件選擇表 - III

Cutting Conditions Selecting Table-III For HSS Drills

表中：上值為回轉速 N (rpm)
下值為進給 f (mm/rev)

The upper data is rotation speed N (R.P.M.)
The lower data is feed speed f (mm/rev)

切削條件表

Table of Drilling Conditions

被削材 Work Material		鑽頭直徑 D (mm)														鑽頭 材質 Drill Mat'l
材質 Material	抗拉力 Tensile Strength N/mm ²	切削速度 Cutting Speed M/Min	1	2	3	4	5	6	7	8	9	10	12	16	20	
灰鑄鐵 Grey Cast Iron																
FC15, FC20	HB180-240	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	
FC30	HB240-300	20	6400	3200	2120	1600	1280	1060	910	800	710	640	530	400	320	HSS
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	
球狀石墨鑄鐵 Ductile Cast Iron																
FCD45, FCD60	HB160-240	25	8000	4000	2650	2000	1600	1330	1140	1000	880	800	660	500	400	HSS
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	
鈦及鈦合金 Titanium & Titanium Alloy																
Ti99.5-99.8 TiA15	350-800	10	3200	1600	1070	800	640	530	460	400	360	320	270	200	160	HS Co
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	
SnZr5																
TiA15V4, TiCu2	700-1200	5	1600	800	540	400	320	270	230	200	180	160	130	100	80	HS Co
			0.010	0.020	0.030	0.040	0.050	0.060	0.070	0.080	0.090	0.100	0.100	0.125	0.160	
純鋁 Pure Aluminum																
A1050T, A2024P	40-450	80	25600	12800	8500	6400	5100	4250	3660	3200	2840	2560	2130	1600	1280	HSS
			0.032	0.038	0.063	0.125	0.125	0.160	0.175	0.200	0.225	0.250	0.250	0.315	0.400	
AiMg7																
鋁合金 Aluminum Alloy																
ADC10	170-280	63	20000	10000	6700	5000	4000	3300	2860	2500	2200	2000	1670	1250	1000	HSS
			0.032	0.038	0.063	0.125	0.125	0.160	0.175	0.200	0.225	0.250	0.250	0.135	0.400	
ADC1, ADC3,	180-300	50														
ADC12			16000	8000	5300	4000	3200	2670	2290	2000	1780	1600	1330	1000	800	HSS
			0.032	0.038	0.063	0.125	0.125	0.160	0.175	0.200	0.225	0.250	0.250	0.315	0.400	
純銅 Copper																
DCu, C1220P	220-370	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.315	

HSS鑽頭之切削條件選擇表-IV

Cutting Conditions Selecting Table-IV For HSS Drills

表中：上值為回轉速 N (rpm)
下值為進給 f (mm/rev)

The upper data is rotation speed N (R.P.M.)
The lower data is feed speed f (mm/rev)

切削條件表

Table of Drilling Conditions

被削材 Work Material		鑽頭直徑 D (mm)														鑽頭 材質 Drill Mat'l
材質 Material	抗拉力 Tensile Strength N/mm ²	切削速度 Cutting Speed M/Min	1	2	3	4	5	6	7	8	9	10	12	16	20	
黃銅 Brass																
YBSC3, C2710P,	280-550	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
C2400P			0.025	0.050	0.075	0.100	0.100	0.120	0.140	0.160	0.180	0.200	0.200	0.250	0.310	
青銅 Phosphoric Bronze																
CuNi115Si,	250-800	25	8000	4000	2650	2000	1600	1330	1140	1000	880	800	660	500	400	HSS
CuNi3Si			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
C715P(T)	300-500	20	6400	3200	2120	1600	1280	1060	910	800	710	640	530	400	320	HS Co
C7060P(T)			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
CuA15, CuA18	300-550	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
C6161P(B)	400-650	15	4800	2400	1600	1200	960	800	690	600	530	480	400	300	240	HS Co
C6191B			0.016	0.032	0.038	0.063	0.063	0.075	0.088	0.100	0.113	0.125	0.125	0.160	0.200	
C5210P	250-350	32	10200	5100	3400	2550	2050	1700	1450	1280	1130	1020	850	640	510	HSS
			0.02	0.04	0.06	0.08	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	
G-CuSn10Zn	250-350	20	6400	3200	2120	1600	1280	1060	910	800	710	640	530	400	320	HS Co
G-CuSn7ZnPb			0.02	0.04	0.06	0.8	0.08	0.096	0.112	0.125	0.144	0.160	0.160	0.200	0.250	

- ◆回轉速：TiN鑽頭 x 1.2 ~ 1.5倍，超硬鑽頭 x 1.5 ~ 2.0倍。
Rotation speed: TiN drill x1.2~1.5, super hard drill x1.5~2.0
- ◆進給：TiN鑽頭如表值，超硬鑽頭 x 0.6 ~ 0.8倍。
Feed: for TiN drill use same data listed in the above table, Carbide drill x 0.6 ~ 0.8.
- ◆深孔(3D以上)進給減少10% ~ 20%，(10D以上)進給減少30%。
For deep hole drilling (over 3D), feed should be reduced by 10~20%.
In case of over 10D, feed should be reduced by 30%.
- ◆本數值僅供參考，應依作業條件隨時修正。
Above data is for reference only. Data may be modified according to actual cutting condition.

麻花鑽頭尖頭的應用

Applications Of Twist Drills

<p>1. U型尖點 (深孔用) U Type Point Angle (For Deep Hole Drilling)</p> 	<p>2. 135°尖點 (韌性材質用) 135° Point Angle (For Tough Materials)</p> 
<p>3. 118°尖點 (一般用途) 118° Point Angle (For General Applications)</p> 	<p>4. 90°尖點 (木材、纖維、塑膠用) 90° Point Angle (For Wood, Fiker And Plastic)</p> 
<p>5. 180°蠟燭型尖點 (薄板用) 180° Candle Type Point Angle (For Thin Sheet)</p> 	<p>6. 腹板削薄 (腹板大於外徑的1/10時用) Web Thinning (For Use When Web Is Bigger Than 1/10 of drill diameter)</p> 
<p>7. 斷屑尖點 (長切屑用) Chip Break Point (For Long Chips)</p> 	<p>8. 修正切唇尖點 (黃銅用) Correct Lip Point (For Brass)</p> 
<p>9. 雙重角度尖點 (減少磨耗用) Double-angle Point Angle (For Reducing Wear)</p> 	<p>10. X型尖點 (硬材質用) X Type Point Angle (For Hard Materials)</p> 

麻花鑽頭加工異常原因及對策-I

Trouble Shooting Table-I For Twist Drill Machining

情況 Problem	原因 Probable Causes	對策 Correction
切削中鑽頭 折斷 Drill breaks during drilling	進給量太大 Excessive feed	減少每週進給量 Reduce feed rate
	切屑阻塞 Chips jammed	1.加大槽寬比 2.選擇適當之螺旋角度 1. Increase flute width ratio 2. Select correct helical angle
	鑽頭剛性不足 Insufficient drill rigidity	1.減少每週進給量 2.縮短鑽頭的長度，以增加鑽頭剛性 3.腹板厚度加大 1. Reduce feed rate. 2. Reduce drill length for increasing rigidity. 3. Increase web thickness.
	貫穿時安定性不夠 (工件不完全被夾住) Poor stability when drilling through (Workpiece not clamped completely)	1.降低貫穿時的每週進給量 2.工作保持固定 3.提高工作機的剛性 1. Reduce feed per revolution while drilling through. 2. Hold workpiece firmly. 3. Increase rigidity of machine.
外角磨損 Outside corner worn out	切削速度太快 Too fast drilling speed	1.降低切削速度 2.加大間隙角 3.充分供給切削液 4.提高鑽頭材質 1. Reduce drilling speed. 2. Increase clearance angle. 3. Supply sufficient cutting fluid. 4. Upgrade drill material.
切唇崩刃 Lip breaks	進給速度太快 Too fast feed speed	減少每週進給量 Reduce feed rate
	切刃強度不足 (過度的間隙角度) Insufficient strength of cutting edges. (Too much clearance angle)	1.減少間隙角度 2.減少附著刃的生成 3.降低貫穿時的每週進給量 4.工作保持固定 1. Reduce clearance angle. 2. Reduce build up edge. 3. Reduce feed rate while drilling through. 4. Hold workpiece firmly.
	使用在擴孔作業時 Too fast feed speed	1.加大尖端角度 2.降低切削速度 3.最好使用三溝或四溝之取心鑽頭 1. Increase point angle. 2. Reduce cutting speed. 3. Use three or four flute drill.

麻花鑽頭加工異常原因及對策 - II

Trouble Shooting Table-II For Twist Drill Machining

情況 Problem	原因 Probable Causes	對策 Correction
錐柄舌部 扭曲、折斷 Shank tongue twisted or broken	錐柄有損傷 Shank is damaged	1.修整錐柄損傷部份 2.檢查錐部柄的配合度 1. Repair damaged part of shank. 2. Check fitting condition of shank.
	套筒磨耗，損傷 Sleeve is worn out or damaged	修整損傷或更新套筒 Repair or replace sleeve.
孔徑擴大 Hole enlarged	尖端角度未對或 刃高差太大或鑿口偏心 Point angle is not symmetric, diffent edge height or cutting angle is offset	1.再研磨 2.腹板削薄，以使求心性增加 3.減少尖端角度 4.使用鑽套 1. Resharpen 2. Thinning web for concentricity . 3. Reduce point angle. 4. Use bushing.
	鑽邊附著熔屑 Melt chips exist on flanks	1.提早再研磨 2.充分供給切削液 3.加大後推拔 4.變更鑽頭設計 1. Resharpen. 2. Supply sufficient cutting fluid. 3. Increase back taper. 4. Change drill design.
孔壁粗糙 Rough drilling surface	刀刃口磨損太大 Drill edge is worn out	再研磨 Resharpen
	進刀速度太快 Too fast feed rate	降低進刀速度 Reduce feed rate
	切屑阻塞 Chips jammed	增加退刀次數 Increase drill intermittent
	鑽邊引起熔著 Flank is melted	再研磨 Resharpen
	其他 Others	1.腹板削薄，增加求心性 2.使用適合導套 3.提高工作機械之剛性 1. Thinning web for concentricity. 2. Use proper bushing. 3. Increase rigidity of machine.

麻花鑽頭加工異常原因及對策 - III

Trouble Shooting Table- III For Twist Drill Machining

情況 Problem	原因 Probable Causes	對策 Correction
鑽孔成橢圓 Elliptic hole	形成來福圈 Rifle circles	<ol style="list-style-type: none"> 1. 使用適合之鑽套 2. 減少間隙角度 3. 檢查鑽頭尖端角度及兩邊長度是否對稱 <ol style="list-style-type: none"> 1. Use proper bushing 2. Reduce clearance angle 3. Check if point angle and both sides are symmetrical or not.
	產生顫動，振動 Chattering; Vibration	<ol style="list-style-type: none"> 1. 減少間隙角度 2. 腹板削薄 3. 縮短鑽頭的長度，增加剛性 4. 檢查鑽頭角度研磨是否正確 5. 檢查夾具與鑽頭接觸情形 6. 預先鑽好中心孔 7. 提高工作機械的剛性 <ol style="list-style-type: none"> 1. Reduce clearance angle. 2. Thinning web. 3. Reduce drill length for increasing rigidity. 4. Check if point angle is correct or not. 5. Check contact condition between chuck and drill. 6. Pre-drill center hole. 7. Increase rigidity of machine.
	切屑排出不易 Poor chip exhaust	<ol style="list-style-type: none"> 1. 加大每週進給量 2. 選擇正確螺旋角 3. 加大槽寬比 4. 採用間歇式進給 <ol style="list-style-type: none"> 1. Increase feed rate. 2. Select correct helical angle. 3. Increase flute width ratio. 4. Apply intermittent feed.
鑽孔傾斜 Skew hole	剛切入時不良 Poor drill infeed	<ol style="list-style-type: none"> 1. 使用適合的鑽套 2. 減少切入時之每週進給量 3. 預先鑽好中心孔 <ol style="list-style-type: none"> 1. Use proper bushing. 2. Reduce drill infeed rate. 3. Pre-drill center hole.
	鑽頭剛性不良 Poor rigidity of drill	縮短鑽頭，提高鑽頭剛性 Reduce drill length for increasing rigidity.
	鑽頭角度不對 Incorrect drill angle	再研磨 Resharpen

鑽削計算

Drilling Calculation Formulas

- ◆ 切削速度與回轉速度
Cutting speed and rotation speed

$$V = \frac{\pi DN}{1000}$$

V : 切削速度 (m/min) ,
以鑽頭圓周速度表示。

V : Cutting speed (m/min)
expressed by
circumference speed
of drill.

D : 鑽頭直徑 (mm)

D : Drill diameter (mm)

N : 回轉速 (R.P.M.)

N : Rotation speed (R.P.M.)

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

例：鑽頭直徑20mm所需切削速度25m/min，
兩線交會點之斜線所示為400，即為所需
轉速R.P.M.

Suppose the drill diameter is 20mm, and the
cutting speed is 25m/min, then the cross
point on the slope line, where two lines
intersect shows the required drill rotation
speed is 400 R.P.M.

- ◆ 進刀速度與進刀量
Feed speed and feed amount

$$F = N \times f$$

F : 進刀速度 (mm/min)

F : Feed speed (mm/min)

f : 進刀量 (mm/rev)

f : Feed amount (mm/rev.)

$$f = \frac{F}{N}$$

- ◆ 鑽孔時間
Drilling time

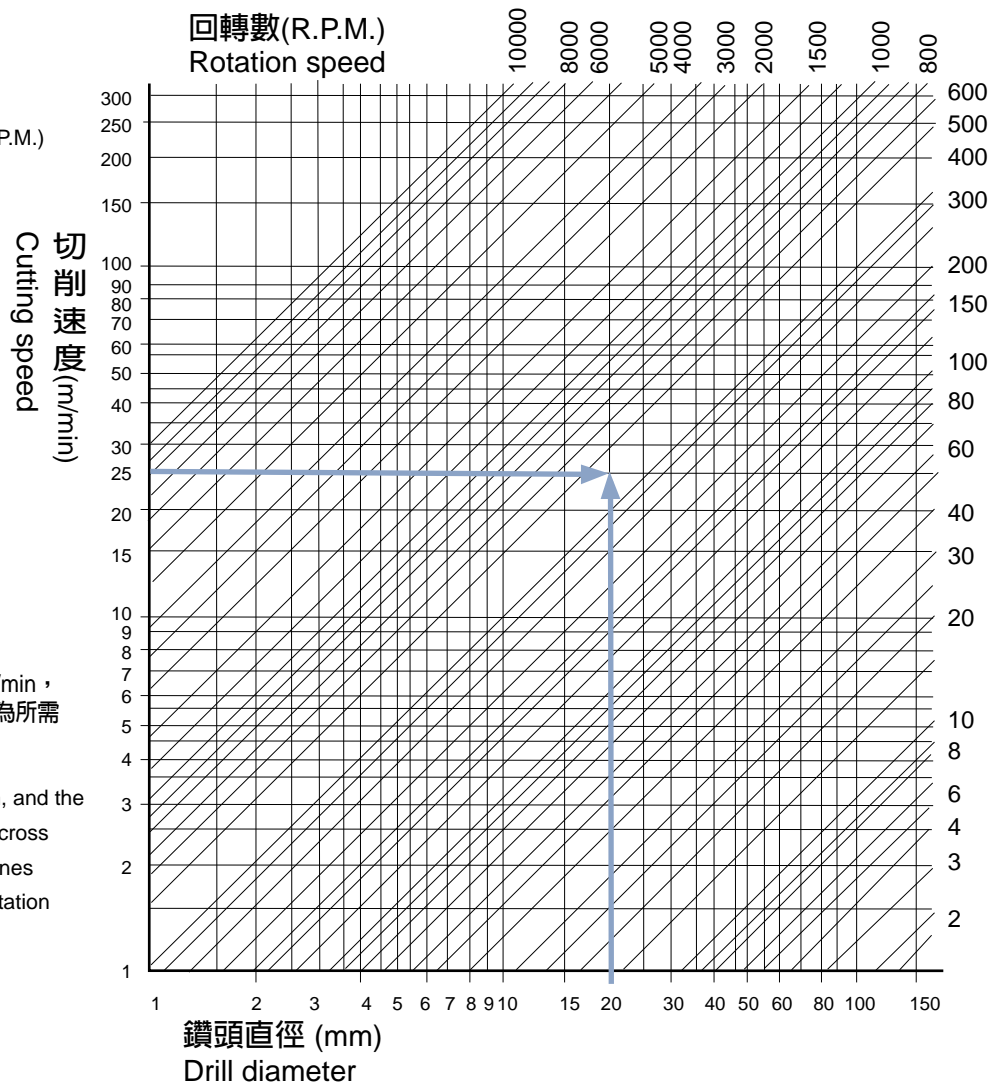
$$T = \frac{L}{N_f} = \frac{\pi DL}{1000Vf}$$

T : 鑽孔時間 (min)

T : Drilling time (min.)

L : 鉗孔深度 (mm)

L : Drilling depth (mm)



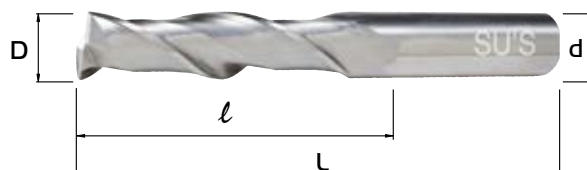
高鈷端銑刀

高鈷端銑刀-標準2刃、長2刃型

HSE End Mills

HSE End Mills-Standard 2 & Long 2 Flutes

SU'S



EM-4141

標準2刃型
Standard 2 Flutes

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	50	2	6
1.5	50	3	6
2.0	50	7	6
2.5	50	7	6
3.0	50	9	6
3.5	60	12	8
4.0	60	12	8
4.5	60	15	8
5.0	60	15	8
5.5	60	15	8
6.0	60	15	8
6.5	65	20	10
7.0	65	20	10
7.5	65	20	10
8.0	65	20	10
8.5	75	25	10
9.0	75	25	10
9.5	75	25	10
10.0	75	25	10
10.5	80	30	12
11.0	80	30	12
12.0	80	30	12
13.0	90	35	16
14.0	90	35	16
15.0	95	40	16
16.0	95	40	16
17.0	105	40	20
18.0	105	40	20
19.0	110	45	20
20.0	110	45	20
21.0	110	45	20
22.0	110	45	20
23.0	120	50	25
24.0	120	50	25
25.0	120	50	25

EM-4143

長2刃型
Long 2 Flutes

HSS-CO 8% (m/m.)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	60	15	6
4.0	60	20	8
5.0	65	25	8
6.0	65	25	8
7.0	80	35	10
8.0	80	35	10
9.0	95	45	10
10.0	95	45	10
11.0	105	55	12
12.0	105	55	12
13.0	110	55	16
14.0	110	55	16
15.0	120	65	16
16.0	120	65	16
17.0	130	65	20
18.0	130	65	20
19.0	140	75	20
20.0	140	75	20
21.0	140	75	20
22.0	140	75	20
23.0	160	90	25
24.0	160	90	25
25.0	160	90	25

切削條件請參照 P52
Cutting data P52

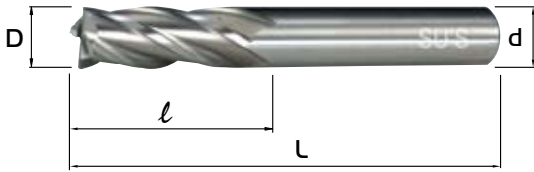
外徑 D (mm)		公差 (μm) Tolerance
以上 Upward 包含 Include	以下 Below	
	10	0 ~ -20
10	30	0 ~ -25

高鈷端銑刀

高鈷端銑刀-標準4刃、長4刃型

HSE End Mills

HSE End Mills-Standard 4 & Long 4 Flutes



EM-4142

標準4刃型
Standard 4 Flutes

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
2.5	50	7	6
3.0	50	9	6
3.5	60	12	8
4.0	60	12	8
4.5	60	15	8
5.0	60	15	8
5.5	60	15	8
6.0	60	15	8
6.5	65	20	10
7.0	65	20	10
7.5	65	20	10
8.0	65	20	10
8.5	75	25	10
9.0	75	25	10
9.5	75	25	10
10.0	75	25	10
11.0	80	30	12
12.0	80	30	12
13.0	90	35	16
14.0	90	35	16
15.0	95	40	16
16.0	95	40	16
17.0	105	40	20
18.0	105	40	20
19.0	110	45	20
20.0	110	45	20
21.0	110	45	20
22.0	110	45	20
23.0	120	50	25
24.0	120	50	25
25.0	120	50	25

EM-4144

長4刃型
Long 4 Flutes

HSS-CO 8% (m/m)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	60	15	6
4.0	60	20	8
5.0	65	25	8
6.0	65	25	8
7.0	80	35	10
8.0	80	35	10
9.0	95	45	10
10.0	95	45	10
11.0	105	55	12
12.0	105	55	12
13.0	110	55	16
14.0	110	55	16
15.0	120	65	16
16.0	120	65	16
17.0	130	65	20
18.0	130	65	20
19.0	140	75	20
20.0	140	75	20
21.0	140	75	20
22.0	140	75	20
23.0	160	90	25
24.0	160	90	25
25.0	160	90	25

切削條件請參照 P52
Cutting data P52

外徑 D (mm)		公差 (μm) Tolerance
以上 Upward 包含 Include	以下 Below	
	10	+20 ~ 0
10	30	+25 ~ 0

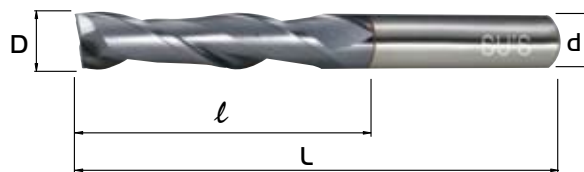
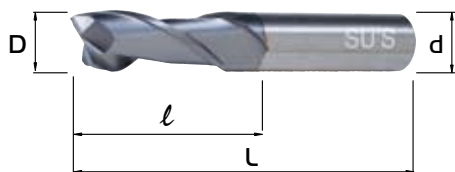
高鈷端銑刀 HSE End Mills

高鈷端銑刀

高鈷端銑刀-覆TiCN標準2刃、長2刃型

HSE End Mills

HSE End Mills-TiCN Coated Standard 2 & Long 2 Flutes



EM-4145

覆TiCN標準2刃型
TiCN Coated Standard 2 Flutes

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	50	2	6
1.5	50	3	6
2.0	50	7	6
2.5	50	7	6
3.0	50	9	6
3.5	60	12	8
4.0	60	12	8
4.5	60	15	8
5.0	60	15	8
5.5	60	15	8
6.0	60	15	8
6.5	65	20	10
7.0	65	20	10
7.5	65	20	10
8.0	65	20	10
8.5	75	25	10
9.0	75	25	10
9.5	75	25	10
10.0	75	25	10
10.5	80	30	12
11.0	80	30	12
12.0	80	30	12
13.0	90	35	16
14.0	90	35	16
15.0	95	40	16
16.0	95	40	16
17.0	105	40	20
18.0	105	40	20
19.0	110	45	20
20.0	110	45	20
21.0	110	45	20
22.0	110	45	20
23.0	120	50	25
24.0	120	50	25
25.0	120	50	25

EM-4147

覆TiCN長2刃型
TiCN Coated Long 2 Flutes

HSS-CO 8% (m/m.)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	60	15	6
4.0	60	20	8
5.0	65	25	8
6.0	65	25	8
7.0	80	35	10
8.0	80	35	10
9.0	95	45	10
10.0	95	45	10
11.0	105	55	12
12.0	105	55	12
13.0	110	55	16
14.0	110	55	16
15.0	120	65	16
16.0	120	65	16
17.0	130	65	20
18.0	130	65	20
19.0	140	75	20
20.0	140	75	20
21.0	140	75	20
22.0	140	75	20
23.0	160	90	25
24.0	160	90	25
25.0	160	90	25

切削條件請參照 P52
Cutting data P52

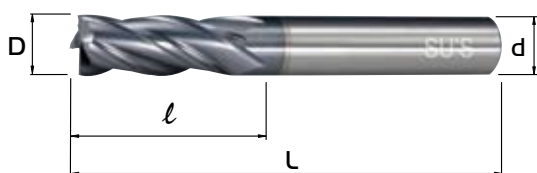
外徑 D (mm)		公差 (μm) Tolerance
以上 Upward 包含 Include	以下 Below	
	10	0 ~ -20
10	30	0 ~ -25

高鈷端銑刀

高鈷端銑刀-覆TiCN標準4刃、長4刃型

HSE End Mills

HSE End Mills-TiCN Coated Standard 4 & Long 4 Flutes



EM-4146

覆TiCN標準4刃型
TiCN Coated Standard 4 Flutes

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
2.5	50	7	6
3.0	50	9	6
3.5	60	12	8
4.0	60	12	8
4.5	60	15	8
5.0	60	15	8
5.5	60	15	8
6.0	60	15	8
6.5	65	20	10
7.0	65	20	10
7.5	65	20	10
8.0	65	20	10
8.5	75	25	10
9.0	75	25	10
9.5	75	25	10
10.0	75	25	10
11.0	80	30	12
12.0	80	30	12
13.0	90	35	16
14.0	90	35	16
15.0	95	40	16
16.0	95	40	16
17.0	105	40	20
18.0	105	40	20
19.0	110	45	20
20.0	110	45	20
21.0	110	45	20
22.0	110	45	20
23.0	120	50	25
24.0	120	50	25
25.0	120	50	25

EM-4148

覆TiCN長4刃型
TiCN Coated Long 4 Flutes

HSS-CO 8% (m/m)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	60	15	6
4.0	60	20	8
5.0	65	25	8
6.0	65	25	8
7.0	80	35	10
8.0	80	35	10
9.0	95	45	10
10.0	95	45	10
11.0	105	55	12
12.0	105	55	12
13.0	110	55	16
14.0	110	55	16
15.0	120	65	16
16.0	120	65	16
17.0	130	65	20
18.0	130	65	20
19.0	140	75	20
20.0	140	75	20
21.0	140	75	20
22.0	140	75	20
23.0	160	90	25
24.0	160	90	25
25.0	160	90	25

切削條件請參照 P52
Cutting data P52

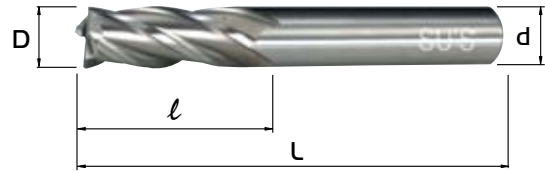
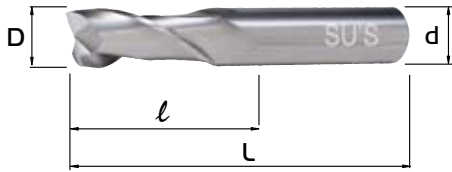
外徑 D (mm)		公差 (μm) Tolerance
以上 Upward 包含 Include	以下 Below	
	10	+20 ~ 0
10	30	+25 ~ 0

高鈷端銑刀

高鈷端銑刀-標準2刃、4刃型 (英制)

HSE End Mills

HSE End Mills-Standard 2 & 4 Flutes(Inch)



EM-4141

標準2刃型 (英制)
Standard 2 Flutes (Inch)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1/8	60	12	8
3/16	60	15	8
1/4	65	20	10
5/16	65	20	10
3/8	75	25	10
7/16	80	30	12
1/2	90	35	16
9/16	95	40	16
5/8	95	40	16
11/16	105	40	20
3/4	110	45	20
13/16	110	45	20
7/8	120	50	25
15/16	120	50	25
1"	120	50	25

EM-4142

標準4刃型 (英制)
Standard 4 Flutes (Inch)

HSS-CO 8% (in.)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1/8	60	12	8
3/16	60	15	8
1/4	65	20	10
5/16	65	20	10
3/8	75	25	10
7/16	80	30	12
1/2	90	35	16
9/16	95	40	16
5/8	95	40	16
11/16	105	40	20
3/4	110	45	20
13/16	110	45	20
7/8	120	50	25
15/16	120	50	25
1"	120	50	25

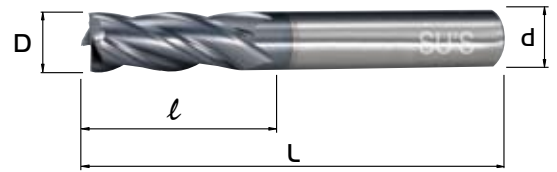
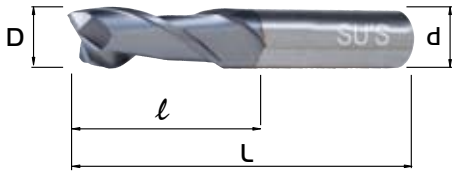
切削條件請參照 P52
Cutting data P52

高鈷端銑刀

高鈷端銑刀-覆TiCN標準2刃、4刃型 (英制)

HSE End Mills

HSE End Mills-TiCN Coated Standard 2 & 4 Flutes(Inch)



EM-4145

覆TiCN標準2刃型 (英制)
TiCN Coated Standard 2 Flutes (Inch)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1/8	60	12	8
3/16	60	15	8
1/4	65	20	10
5/16	65	20	10
3/8	75	25	10
7/16	80	30	12
1/2	90	35	16
9/16	95	40	16
5/8	95	40	16
11/16	105	40	20
3/4	110	45	20
13/16	110	45	20
7/8	120	50	25
15/16	120	50	25
1"	120	50	25

EM-4146

覆TiCN標準4刃型 (英制)
TiCN Coated Standard 4 Flutes (Inch)
HSS-CO 8% (in.)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1/8	60	12	8
3/16	60	15	8
1/4	65	20	10
5/16	65	20	10
3/8	75	25	10
7/16	80	30	12
1/2	90	35	16
9/16	95	40	16
5/8	95	40	16
11/16	105	40	20
3/4	110	45	20
13/16	110	45	20
7/8	120	50	25
15/16	120	50	25
1"	120	50	25

切削條件請參照 P52
Cutting data P52

高鈷端銑刀 HSE End Mills

標準2刃、4刃高鈷端銑刀鑽切削條件選擇表

Recommended Milling Conditions For HSE End Mills

高鈷端銑刀 HSE End Mills

被削材 Work Material		切削條件 Milling Conditions		銑刀外徑 Dia Of Mill/mm											
材質 Material	硬度 Hardness	切削速度 Cutting Speed	參考條件 Reference	1	2	3	4	5	6	8	10	12	16	20	25
構造用鋼 Structural Steel 碳素鋼 Carbon Steel SS34 SS41 SS50 S45C	HB220 以下 Lower	V=m/min 18 - 25	回轉速 R.P.M.	5500	3200	2400	2000	1600	1400	1050	850	720	550	420	350
			進給速度 Feed mm/min	2刃 2 Flutes 65	70	75	80	90	100	110	110	110	110	100	80
合金鋼 Alloy Steel 碳素鋼 Carbon Steel SCr SCM SNCM440 S55C	HB 200~250	18 - 20	回轉速 R.P.M.	5000	2500	2000	1400	1150	950	720	580	480	350	280	240
			進給速度 Feed mm/min	2刃 2 Flutes 50	55	60	65	75	75	80	85	80	80	75	60
工具鋼 Tool Steel 模具鋼 Mold Steel SKD SKT SKS	HB 230~330	10 - 15	回轉速 R.P.M.	3200	1900	1500	1100	950	800	600	500	420	320	250	200
			進給速度 Feed mm/min	2刃 2 Flutes 35	45	50	50	60	60	60	60	60	55	50	45
不銹鋼 Stainless Steel SUS 410 420 SUS 304 316	N/mm ² 500~900 HB 150~250	8 - 12	回轉速 R.P.M.	2500	1500	1150	900	750	650	500	400	330	250	200	150
			進給速度 Feed mm/min	2刃 2 Flutes 20	25	30	30	35	40	40	45	40	35	30	25
非鐵金屬 Non Ferrous 鋁合金 Aluminum Alloy ADC	N/mm ² 180~300	40 - 60	回轉速 R.P.M.	12000	7500	5300	4100	3500	3000	2300	1850	1650	1200	950	750
			進給速度 Feed mm/min	2刃 2 Flutes 150	150	220	260	300	300	330	350	350	300	250	230
鑄鐵 Cast Iron FC FCD	HB 180~300	18 - 22	回轉速 R.P.M.	5100	2850	2000	1600	1300	1100	850	700	580	440	340	285
			進給速度 Feed mm/min	2刃 2 Flutes 65	75	80	90	100	105	110	120	110	105	90	80

備註 Notes	側銑深度值 Side Milling	槽銑深度值 Slotting	<ul style="list-style-type: none"> ◆ 覆TiCN端銑刀，請依上述切削速度、回轉速之數據調升30%切削。 ◆ 長刃端銑刀則依上述數據調降30%~40%。 ◆ For TiCN coated end mills, use above listed cutting speed, the rotation speed should be increased by 30%. ◆ For long flute end mills, reduce 30%-40% of above listed data.
	直徑D > Ø3 W = 0.2D H = 1.5D 直徑D < Ø3 W = 0.1D H = 1D	直徑D > Ø3 H = 0.5D 直徑D < Ø3 0H = 0.1~0.2D	

鎢鋼鑽頭

銑刀柄鎢鋼高速鑽頭

Solid Carbide Drills

End Mill Shank-Solid Carbide High Speed Drills

TiAIN 複合多層被覆
TiAIN multi layer Coated

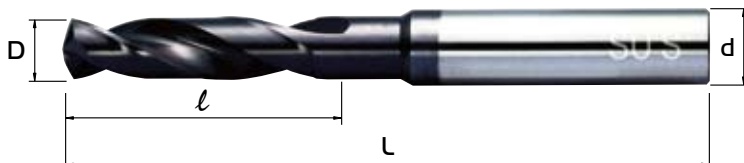
WD-1711

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼

Applicable materials :

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
2.0	44	13	3
2.1	44	13	3
2.2	44	13	3
2.3	44	13	3
2.4	46	15	3
2.5	46	15	3
2.6	46	15	3
2.7	48	17	3
2.8	48	17	3
2.9	48	17	3
3.0	48	17	3
3.1	50	19	4
3.2	50	19	4
3.3	50	19	4
3.4	52	21	4
3.5	52	21	4
3.6	52	21	4
3.7	52	21	4
3.8	52	21	4
3.9	52	21	4
4.0	52	21	4
4.1	63	21	6
4.2	63	21	6
4.3	63	21	6
4.4	68	25	6
4.5	68	25	6
4.6	68	25	6
4.7	68	25	6
4.8	70	27	6
4.9	70	27	6
5.0	70	27	6
5.1	70	27	6
5.2	70	27	6
5.3	70	27	6
5.4	72	29	6
5.5	72	29	6
5.6	72	29	6
5.7	72	29	6
5.8	72	29	6
5.9	72	29	6

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	72	29	6
6.1	75	32	8
6.2	75	32	8
6.3	75	32	8
6.4	75	32	8
6.5	75	32	8
6.6	75	32	8
6.7	75	32	8
6.8	78	35	8
6.9	78	35	8
7.0	78	35	8
7.1	78	35	8
7.2	78	35	8
7.3	78	35	8
7.4	78	35	8
7.5	78	35	8
7.6	78	35	8
7.7	78	35	8
7.8	78	35	8
7.9	78	35	8
8.0	78	35	8
8.1	87	38	10
8.2	87	38	10
8.3	87	38	10
8.4	87	38	10
8.5	87	38	10
8.6	90	41	10
8.7	90	41	10
8.8	90	41	10
8.9	90	41	10
9.0	90	41	10
9.1	90	41	10
9.2	90	41	10
9.3	90	41	10
9.4	90	41	10
9.5	90	41	10
9.6	93	44	10
9.7	93	44	10
9.8	93	44	10
9.9	93	44	10

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
10.0	93	44	10
10.1	100	44	12
10.2	100	44	12
10.3	100	44	12
10.4	100	44	12
10.5	100	44	12
10.6	100	44	12
10.7	104	48	12
10.8	104	48	12
10.9	104	48	12
11.0	104	48	12
11.1	104	48	12
11.2	104	48	12
11.3	104	48	12
11.4	104	48	12
11.5	104	48	12
11.6	104	48	12
11.7	104	48	12
11.8	104	48	12
11.9	104	48	12
12.0	104	48	12
※ 12.1	105	50	14
※ 12.2	105	50	14
※ 12.3	105	50	14
※ 12.4	105	50	14
※ 12.5	105	50	14
※ 12.6	105	50	14
※ 12.7	105	50	14
※ 12.8	105	50	14
※ 12.9	105	50	14
※ 13.0	105	50	14

※：無庫存，請另詢
※：None in stock, please contact us

切削條件請參照P60
Cutting data P60

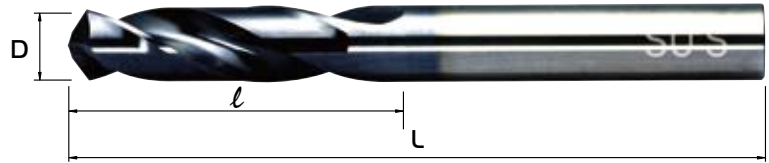
WD-1721

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼、鋁合金

Applicable materials :

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
1.0	26	6
1.1	28	7
1.2	30	8
1.3	30	8
1.4	32	9
1.5	32	9
1.6	34	10
1.7	34	10
1.8	36	11
1.9	36	11
2.0	38	12
2.1	38	12
2.2	40	13
2.3	40	13
2.4	43	14
2.5	43	14
2.6	43	14
2.7	46	16
2.8	46	16
2.9	46	16
3.0	46	16
3.1	49	18
3.2	49	18
3.3	49	18
3.4	52	20
3.5	52	20
3.6	52	20
3.7	52	20
3.8	55	22
3.9	55	22
4.0	55	22
4.1	55	22
4.2	55	22
4.3	58	24
4.4	58	24
4.5	58	24
4.6	58	24
4.7	58	24
4.8	62	26
4.9	62	26

直徑 D mm	全長 L mm	溝長 l mm
5.0	62	26
5.1	62	26
5.2	62	26
5.3	62	26
5.4	66	28
5.5	66	28
5.6	66	28
5.7	66	28
5.8	66	28
5.9	66	28
6.0	66	28
6.1	70	31
6.2	70	31
6.3	70	31
6.4	70	31
6.5	70	31
6.6	70	31
6.7	70	31
6.8	74	34
6.9	74	34
7.0	74	34
7.1	74	34
7.2	74	34
7.3	74	34
7.4	74	34
7.5	74	34
7.6	79	37
7.7	79	37
7.8	79	37
7.9	79	37
8.0	79	37
8.1	79	37
8.2	79	37
8.3	79	37
8.4	79	37
8.5	79	37
8.6	84	40
8.7	84	40
8.8	84	40
8.9	84	40

直徑 D mm	全長 L mm	溝長 l mm
9.0	84	40
9.1	84	40
9.2	84	40
9.3	84	40
9.4	84	40
9.5	84	40
9.6	89	43
9.7	89	43
9.8	89	43
9.9	89	43
10.0	89	43
10.1	89	43
10.2	89	43
10.3	89	43
10.4	89	43
10.5	89	43
10.6	89	43
10.7	89	43
10.8	95	47
10.9	95	47
11.0	95	47
11.1	95	47
11.2	95	47
11.3	95	47
11.4	95	47
11.5	95	47
11.6	95	47
11.7	95	47
11.8	95	47
11.9	102	51
12.0	102	51
12.1	102	51
12.2	102	51
12.3	102	51
12.4	102	51
12.5	102	51
12.6	102	51
12.7	102	51
12.8	102	51
12.9	102	51
13.0	102	51

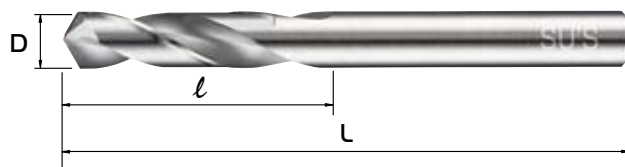
WD-1722

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、球墨鑄鐵、
模具鋼、鋁合金

Applicable materials :

Structural Steels, Mild Steels, Alloy Steels,
Hardened Steels, Ductile Cast Iron,
Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
1.0	26	6
1.1	28	7
1.2	30	8
1.3	30	8
1.4	32	9
1.5	32	9
1.6	34	10
1.7	34	10
1.8	36	11
1.9	36	11
2.0	38	12
2.1	38	12
2.2	40	13
2.3	40	13
2.4	43	14
2.5	43	14
2.6	43	14
2.7	46	16
2.8	46	16
2.9	46	16
3.0	46	16
3.1	49	18
3.2	49	18
3.3	49	18
3.4	52	20
3.5	52	20
3.6	52	20
3.7	52	20
3.8	55	22
3.9	55	22
4.0	55	22
4.1	55	22
4.2	55	22
4.3	58	24
4.4	58	24
4.5	58	24
4.6	58	24
4.7	58	24
4.8	62	26
4.9	62	26

直徑 D mm	全長 L mm	溝長 l mm
5.0	62	26
5.1	62	26
5.2	62	26
5.3	62	26
5.4	66	28
5.5	66	28
5.6	66	28
5.7	66	28
5.8	66	28
5.9	66	28
6.0	66	28
6.1	70	31
6.2	70	31
6.3	70	31
6.4	70	31
6.5	70	31
6.6	70	31
6.7	70	31
6.8	74	34
6.9	74	34
7.0	74	34
7.1	74	34
7.2	74	34
7.3	74	34
7.4	74	34
7.5	74	34
7.6	79	37
7.7	79	37
7.8	79	37
7.9	79	37
8.0	79	37
8.1	79	37
8.2	79	37
8.3	79	37
8.4	79	37
8.5	79	37
8.6	84	40
8.7	84	40
8.8	84	40
8.9	84	40

直徑 D mm	全長 L mm	溝長 l mm
9.0	84	40
9.1	84	40
9.2	84	40
9.3	84	40
9.4	84	40
9.5	84	40
9.6	89	43
9.7	89	43
9.8	89	43
9.9	89	43
10.0	89	43
10.1	89	43
10.2	89	43
10.3	89	43
10.4	89	43
10.5	89	43
10.6	89	43
10.7	89	43
10.8	95	47
10.9	95	47
11.0	95	47
11.1	95	47
11.2	95	47
11.3	95	47
11.4	95	47
11.5	95	47
11.6	95	47
11.7	95	47
11.8	95	47
11.9	102	51
12.0	102	51
12.1	102	51
12.2	102	51
12.3	102	51
12.4	102	51
12.5	102	51
12.6	102	51
12.7	102	51
12.8	102	51
12.9	102	51
13.0	102	51

鎢鋼鑽頭

TiAlN鎢鋼直柄鑽頭DIN 338

Solid Carbide Drills

TiAlN Solid Carbide Straight Shank Drills

TiAlN 複合多層被覆
TiAlN multi layer Coated

SUS

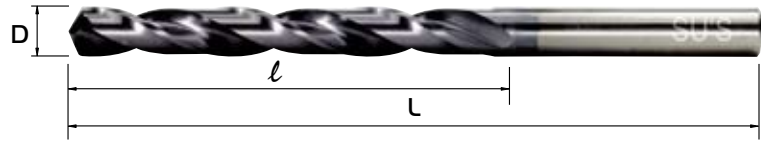
WD-1731

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼、鋁合金

Applicable materials :

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
1.0	34	12
1.1	36	12
1.2	38	16
1.3	38	16
1.4	40	18
1.5	40	18
1.6	43	20
1.7	43	20
1.8	46	22
1.9	46	22
2.0	49	24
2.1	49	24
2.2	53	27
2.3	53	27
2.4	57	30
2.5	57	30
2.6	57	30
2.7	61	33
2.8	61	33
2.9	61	33
3.0	61	33
3.1	65	36
3.2	65	36
3.3	65	36
3.4	70	39
3.5	70	39
3.6	70	39
3.7	70	39
3.8	75	43
3.9	75	43
4.0	75	43
4.1	75	43
4.2	75	43
4.3	80	47
4.4	80	47
4.5	80	47
4.6	80	47
4.7	80	47
4.8	86	52
4.9	86	52

直徑 D mm	全長 L mm	溝長 l mm
5.0	86	52
5.1	86	52
5.2	86	52
5.3	86	52
5.4	93	57
5.5	93	57
5.6	93	57
5.7	93	57
5.8	93	57
5.9	93	57
6.0	93	57
6.1	101	63
6.2	101	63
6.3	101	63
6.4	101	63
6.5	101	63
6.6	101	63
6.7	101	63
6.8	109	69
6.9	109	69
7.0	109	69
7.1	109	69
7.2	109	69
7.3	109	69
7.4	109	69
7.5	109	69
7.6	117	75
7.7	117	75
7.8	117	75
7.9	117	75
8.0	117	75
8.1	117	75
8.2	117	75
8.3	117	75
8.4	117	75
8.5	117	75
8.6	125	81
8.7	125	81
8.8	125	81
8.9	125	81

直徑 D mm	全長 L mm	溝長 l mm
9.0	125	81
9.1	125	81
9.2	125	81
9.3	125	81
9.4	125	81
9.5	125	81
9.6	133	87
9.7	133	87
9.8	133	87
9.9	133	87
10.0	133	87
10.1	133	87
10.2	133	87
10.3	133	87
10.4	133	87
10.5	133	87
10.6	133	87
10.7	133	87
10.8	142	94
10.9	142	94
11.0	142	94
11.1	142	94
11.2	142	94
11.3	142	94
11.4	142	94
11.5	142	94
11.6	142	94
11.7	142	94
11.8	142	94
11.9	151	101
12.0	151	101
12.1	151	101
12.2	151	101
12.3	151	101
12.4	151	101
12.5	151	101
12.6	151	101
12.7	151	101
12.8	151	101
12.9	151	101
13.0	151	101

切削條件請參照 P61
Cutting data P61

WD-1732

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼、鋁合金

Applicable materials :

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
1.0	34	12
1.1	36	12
1.2	38	16
1.3	38	16
1.4	40	18
1.5	40	18
1.6	43	20
1.7	43	20
1.8	46	22
1.9	46	22
2.0	49	24
2.1	49	24
2.2	53	27
2.3	53	27
2.4	57	30
2.5	57	30
2.6	57	30
2.7	61	33
2.8	61	33
2.9	61	33
3.0	61	33
3.1	65	36
3.2	65	36
3.3	65	36
3.4	70	39
3.5	70	39
3.6	70	39
3.7	70	39
3.8	75	43
3.9	75	43
4.0	75	43
4.1	75	43
4.2	75	43
4.3	80	47
4.4	80	47
4.5	80	47
4.6	80	47
4.7	80	47
4.8	86	52
4.9	86	52

直徑 D mm	全長 L mm	溝長 l mm
5.0	86	52
5.1	86	52
5.2	86	52
5.3	86	52
5.4	93	57
5.5	93	57
5.6	93	57
5.7	93	57
5.8	93	57
5.9	93	57
6.0	93	57
6.1	101	63
6.2	101	63
6.3	101	63
6.4	101	63
6.5	101	63
6.6	101	63
6.7	101	63
6.8	109	69
6.9	109	69
7.0	109	69
7.1	109	69
7.2	109	69
7.3	109	69
7.4	109	69
7.5	109	69
7.6	117	75
7.7	117	75
7.8	117	75
7.9	117	75
8.0	117	75
8.1	117	75
8.2	117	75
8.3	117	75
8.4	117	75
8.5	117	75
8.6	125	81
8.7	125	81
8.8	125	81
8.9	125	81

直徑 D mm	全長 L mm	溝長 l mm
9.0	125	81
9.1	125	81
9.2	125	81
9.3	125	81
9.4	125	81
9.5	125	81
9.6	133	87
9.7	133	87
9.8	133	87
9.9	133	87
10.0	133	87
10.1	133	87
10.2	133	87
10.3	133	87
10.4	133	87
10.5	133	87
10.6	133	87
10.7	133	87
10.8	142	94
10.9	142	94
11.0	142	94
11.1	142	94
11.2	142	94
11.3	142	94
11.4	142	94
11.5	142	94
11.6	142	94
11.7	142	94
11.8	142	94
11.9	151	101
12.0	151	101
12.1	151	101
12.2	151	101
12.3	151	101
12.4	151	101
12.5	151	101
12.6	151	101
12.7	151	101
12.8	151	101
12.9	151	101
13.0	151	101

WP-1751

90° 鎢鋼NC定點鑽頭

90° Solid Carbide NC Spotting Drills

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼、鋁合金

Applicable materials：

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
3.0	45	10
4.0	50	12
5.0	50	15
6.0	60	20

直徑 D mm	全長 L mm	溝長 l mm
8.0	60	25
10.0	75	25
12.0	75	30
16.0	100	35

切削條件請參照 P62
Cutting data P62

WP-1761

120° 鎢鋼NC定點鑽頭

120° Solid Carbide NC Spotting Drills

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、球墨鑄鐵、模具鋼、鋁合金

Applicable materials：

Structural Steels, Mild Steels, Alloy Steels, Hardened Steels, Extra Hard Steels, Ductile Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
3.0	45	10
4.0	50	12
5.0	50	15
6.0	60	20

直徑 D mm	全長 L mm	溝長 l mm
8.0	60	25
10.0	75	25
12.0	75	30
16.0	100	35

切削條件請參照 P62
Cutting data P62

WP-1752

90° 鎢鋼NC定點鑽頭

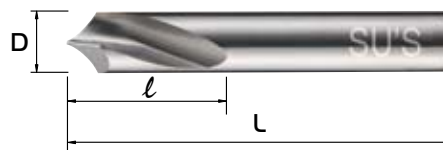
90° Solid Carbide NC Spotting Drills

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、
球墨鑄鐵、模具鋼、鋁合金

Applicable materials：

Structural Steels, Mild Steels, Alloy Steels,
Hardened Steels, Extra Hard Steels, Ductile
Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
3.0	45	10
4.0	50	12
5.0	50	15
6.0	60	20

直徑 D mm	全長 L mm	溝長 l mm
8.0	60	25
10.0	75	25
12.0	75	30
16.0	100	35

切削條件請參照 P62
Cutting data P62

WP-1762

120° 鎢鋼NC定點鑽頭

120° Solid Carbide NC Spotting Drills

適用材質：

構造用鋼、中碳鋼、合金鋼、調質鋼、高硬度鋼、
球墨鑄鐵、模具鋼、鋁合金

Applicable materials：

Structural Steels, Mild Steels, Alloy Steels,
Hardened Steels, Extra Hard Steels, Ductile
Cast Iron, Mold Steels, Aluminum



直徑 D mm	全長 L mm	溝長 l mm
3.0	45	10
4.0	50	12
5.0	50	15
6.0	60	20

直徑 D mm	全長 L mm	溝長 l mm
8.0	60	25
10.0	75	25
12.0	75	30
16.0	100	35

切削條件請參照 P62
Cutting data P62

WD-1711

高速濕式鑽孔加工 High Speed Wet Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28~40HRC)		高硬度鋼 Extra Hard Steels (40~52HRC)		球墨鑄鐵 Ductile Cast Iron FCD	
	100		100		90		65		45		90	
切削速度 Cutting Speed V m/min	100		100		90		65		45		90	
鑽頭外徑 Dia Of Drill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
3	10500	630	10500	1000	9500	920	6900	700	4800	410	9500	550
4	8000	600	8000	980	7000	850	5000	640	3500	380	7000	510
5	6400	560	6400	920	5700	820	4000	600	2800	360	5700	490
6	5200	520	5200	850	4800	780	3400	580	2400	340	4800	470
7	4500	500	4500	820	4100	750	3000	580	2000	320	4100	450
8	4000	500	4000	800	3500	700	2500	530	1800	320	3500	420
9	3500	470	3500	770	3200	700	2300	530	1600	310	3200	420
10	3200	460	3200	770	2800	670	2000	500	1400	300	2800	400
11	2900	450	2900	770	2600	660	1850	490	1300	290	2600	400
12	2600	430	2600	740	2400	650	1700	480	1200	290	2400	390

乾式鑽孔加工 Dry Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28~40HRC)		高硬度鋼 Extra Hard Steels (40~52HRC)		球墨鑄鐵 Ductile Cast Iron FCD	
	70		65		60		32		20		60	
切削速度 Cutting Speed V m/min	70		65		60		32		20		60	
鑽頭外徑 Dia Of Drill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
3	7400	350	6900	470	6400	440	3400	240	2100	120	6400	370
4	5500	330	5000	430	4800	410	2500	220	1600	120	4800	350
5	4400	310	4000	400	3800	380	2000	210	1300	110	3800	330
6	3700	300	3400	390	3200	360	1700	200	1050	100	3200	310
7	3200	280	3000	380	2700	340	1450	200	900	100	2700	300
8	2700	260	2500	350	2400	340	1250	180	800	100	2400	290
9	2500	260	2300	350	2100	320	1100	180	700	90	2100	280
10	2200	250	2000	340	1900	320	1000	180	650	90	1900	270
11	2000	250	1850	330	1700	300	900	170	580	90	1700	270
12	1850	250	1700	320	1600	300	850	170	530	90	1600	270

- 不適用於鋁合金、不銹鋼之長屑切削。
- 工件及機械若有震動或異聲時，請視情況降低切削條件。
- 乾式切削請用空氣冷卻及排屑，避免被高溫切屑燙傷。
- Not recommended for long chip machining for Aluminum Alloy and Stainless Steel.
- In case vibration or abnormal sound occurs on workpiece or machine, change machining conditions.
- When performing dry drilling, apply air for cooling and chip removing, care should be taken to avoid burned by hot drills.

WD-1721 / 1731

高速濕式鑽孔加工 High Speed Wet Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28~40HRC)		高硬度鋼 Extra Hard Steels (40~52HRC)		球墨鑄鐵 Ductile Cast Iron FCD		鋁合金 Aluminum ADC	
	90		90		80		55		40		75		90	
切削速度 Cutting Speed V m/min	90		90		80		55		40		75		90	
鑽頭外徑 Dia Of Drill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
2	14000	560	14000	880	12800	780	8800	590	6400	340	12000	450	14000	900
3	9500	510	9500	830	8500	740	5800	530	4200	320	8000	420	9600	860
4	7000	480	7000	770	6400	700	4400	510	3200	310	6000	400	7000	780
5	5700	450	5700	740	5100	660	3500	480	2500	290	4800	370	5700	750
6	4800	430	4800	710	4200	620	2900	450	2100	270	4000	350	4800	720
7	4100	410	4100	680	3600	590	2500	430	1800	260	3400	340	4100	690
8	3500	390	3500	630	3200	580	2200	420	1600	260	3000	330	3500	650
9	3200	390	3200	630	2800	550	1950	410	1400	250	2700	320	3200	650
10	2800	370	2800	600	2500	540	1750	400	1250	240	2400	310	2850	630
11	2600	360	2600	590	2300	520	1600	380	1150	230	2200	300	2600	610
12	2400	360	2400	580	2100	510	1450	370	1050	230	2000	290	2400	600
13	2200	350	2200	560	2000	510	1350	360	1000	230	1800	280	2200	580

WD-1721 / 1731

乾式鑽孔加工 Dry Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28~40HRC)		高硬度鋼 Extra Hard Steels (40~52HRC)		球墨鑄鐵 Ductile Cast Iron FCD	
	65		60		55		28		18		55	
切削速度 Cutting Speed V m/min	65		60		55		28		18		55	
鑽頭外徑 Dia Of Drill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
2	10000	340	9600	450	8800	400	4400	220	2800	110	880	350
3	6900	310	6400	420	5800	380	3000	210	1900	110	5800	330
4	5000	270	4800	390	4400	360	2200	200	1400	100	4400	320
5	4000	260	3800	360	3500	330	1800	190	1200	100	3500	300
6	3400	260	3200	350	2900	320	1500	180	950	90	2900	280
7	3000	250	2700	340	2500	310	1250	170	820	90	2500	270
8	2500	230	2400	320	2200	300	1100	160	700	85	2200	260
9	2300	230	2100	320	1950	300	1000	160	640	85	1950	250
10	2000	220	1900	310	1750	290	900	160	600	85	1750	240
11	1850	220	1700	300	1600	280	800	150	520	80	1600	240
12	1700	220	1600	290	1450	270	700	150	480	80	1450	230
13	1600	210	1450	280	1350	260	680	140	440	80	1350	230

- 工件及機械若有震動或異聲時，請視情況降低切削條件。
- 乾式切削請用空氣冷卻及排屑，避免被高溫切屑燙傷。
- In case vibration or abnormal sound occurs on workpiece or machine, change machining conditions.
- When performing dry drilling, apply air for cooling and chip removing, care should be taken to avoid burned by hot drills.

WD-1722 / 1732

濕式鑽孔加工 Wet Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28-40HRC)		高硬度鋼 Extra Hard Steels (40-52HRC)		球墨鑄鐵 Ductile Cast Iron FCD		鋁合金 Aluminum ADC	
	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
切削速度 Cutting Speed V m/min	40		30		25		20		8		35		60	
鑽頭外徑 Dia Of Drill	2	3	4	5	6	7	8	9	10	11	12	13		
	6400	230	4800	230	4000	160	3200	95	1300	31	5600	430	9600	570
	4200	200	3200	210	2600	140	2100	85	850	28	3700	390	6400	520
	3200	190	2400	190	2000	130	1600	80	650	26	2800	350	4800	470
	2600	180	1900	180	1600	125	1300	75	510	24	2200	320	3800	440
	2100	170	1600	170	1300	115	1050	70	420	22	1850	310	3200	430
	1800	160	1350	160	1100	110	900	65	360	21	1600	300	2700	410
	1600	155	1200	160	1000	110	800	65	330	21	1400	300	2400	400
	1400	150	1050	150	900	105	700	65	280	20	1250	290	2100	380
	1300	150	950	145	800	100	650	60	250	19	1100	270	1900	370
	1200	150	850	140	700	95	600	60	230	19	1000	260	1700	360
	1060	140	800	140	650	95	530	60	210	18	930	260	1600	350
	1000	140	750	140	600	85	500	55	200	18	850	250	1500	340

WP-1751 / 1761

鎢鋼定點鑽頭鑽孔 Solid Carbide Spotting Drilling

被削材 Work Material	構造用鋼 Structural Steels SS4 1		中碳鋼 Mild Steels S45C		合金鋼Alloy Steels SCM		模具鋼Mold Steels 調質鋼Hardened Steels (28-40HRC)		高硬度鋼 Extra Hard Steels (40-52HRC)		球墨鑄鐵 Ductile Cast Iron FCD		鋁合金 Aluminum ADC	
	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
切削速度 Cutting Speed V m/min	70		55		45		25		20		75		110	
鑽頭外徑 Dia Of Drill	3	4	5	6	8	10	12	16	20					
	7500	450	5800	350	4800	300	2600	160	2100	130	8000	600	12000	1800
	5600	450	4400	350	3600	300	2000	160	1600	180	6000	600	9000	1600
	4500	400	3500	320	2800	250	1600	145	1300	120	4800	600	7000	1400
	3800	380	2900	290	2400	240	1300	130	1050	110	4000	600	6000	1300
	2800	340	2200	260	1800	220	1000	120	800	100	3000	500	4500	1100
	2300	320	1800	250	1400	200	800	110	650	90	2400	500	3500	1000
	1900	300	1500	240	1200	190	650	110	550	90	2000	500	3000	950
	1400	280	1100	220	900	180	500	100	400	80	1500	400	2300	900
	1100	280	900	220	700	180	400	100	320	80	1200	400	1800	900

- WP-1752/1762切削速度依上列數據調降20-30%。
- The cutting speed of WP-1752/1762 is recommended to be lower 20-30% based on above data.

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢立銑刀 Micro Grain Carbide End Mills

AICrN 複合多層被覆
AICrN multi layer Coated

WE-4201

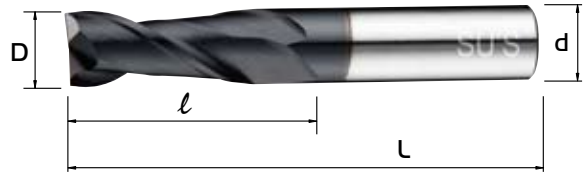
2刃立銑刀 2-Flute End Mills

適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	50	3.0	4.0
1.5	50	4.0	4.0
2.0	50	6.0	4.0
2.5	50	7.0	4.0
3.0	50	8.0	4.0
3.5	50	10.0	4.0
4.0	50	12.0	4.0
4.5	50	13.0	6.0
5.0	50	13.0	6.0
5.5	50	13.0	6.0
6.0	50	13.0	6.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	60	15.0	6.0
6.5	60	15.0	8.0
7.0	60	17.0	8.0
7.5	60	17.0	8.0
8.0	60	20.0	8.0
8.5	75	25.0	10.0
9.0	75	25.0	10.0
9.5	75	25.0	10.0
10.0	75	25.0	10.0
10.5	75	25.0	12.0
11.0	75	28.0	12.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
11.5	75	28.0	12.0
12.0	75	30.0	12.0
12.5	80	30.0	14.0
13.0	80	32.0	14.0
14.0	80	32.0	14.0
15.0	80	32.0	16.0
16.0	80	32.0	16.0
17.0	100	45.0	18.0
18.0	100	45.0	18.0
19.0	100	45.0	20.0
20.0	100	45.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵 Cast Iron 結構鋼鐵 Structural Steels 碳素鋼 Carbon Steels FC SS400 S45C		合金鋼 Alloy Steels 工具鋼 Tool Steels SCM SKS SKD		調質鋼 Hardened Steels 預硬鋼 Prehardened Steels SKT,SKD		不銹鋼 Stainless Steels 調質鋼 Hardened Steels SUS,SKD		調質鋼 Hardened Steels 耐熱合金鋼 Nickel Alloy		
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	60~85	50~70	35~50	25~35
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	
	1	22400	120	17000	90	11000	35	6600	20	6500	18
2	11200	220	9000	100	6000	40	3800	25	3600	23	
3	7500	230	6500	120	4200	55	2500	35	2200	28	
4	5600	230	5000	130	3200	70	2000	40	1800	35	
5	5000	230	4300	150	3000	90	1900	50	1600	45	
6	4200	250	3500	180	2500	90	1550	50	1300	50	
8	3100	300	2800	220	1900	100	1150	60	1000	60	
10	2500	300	2100	250	1500	100	950	60	800	60	
12	2100	320	1800	250	1250	110	790	60	660	60	
14	1900	320	1500	250	1100	110	650	70	580	60	
16	1600	300	1350	230	950	110	580	65	520	55	
18	1400	300	1200	230	800	100	520	65	480	55	
20	1200	300	1000	230	700	100	480	65	440	55	
切削深度值 Depth Of Cut	h=1.5D W=0.25D H=0.5D		h=1.5D W=0.2D H=0.3D		h=1.2D W=0.1D H=0.2D		h=1.2D W=0.05D H=0.15D		h=1D W=0.03D H=0.1D		
側銑削場合 Side Milling			槽銑削場合 Slotting			側銑場合進給速度可提高10%~20% Feed speed may be increased by 10-20% when performing side milling					

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢立銑刀 Micro Grain Carbide End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

WE-4401

4刃立銑刀 4-Flute End Mills

適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	50	3.0	4.0
1.5	50	4.0	4.0
2.0	50	5.0	4.0
2.5	50	6.0	4.0
3.0	50	7.5	4.0
3.5	50	7.5	4.0
4.0	50	12.0	4.0
4.5	50	12.0	6.0
5.0	50	12.5	6.0
5.5	50	12.5	6.0
6.0	50	12.5	6.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	60	15.0	6.0
6.5	60	15.0	8.0
7.0	60	20.0	8.0
7.5	60	20.0	8.0
8.0	60	20.0	8.0
8.5	75	20.0	10.0
9.0	75	25.0	10.0
9.5	75	25.0	10.0
10.0	75	30.0	10.0
10.5	75	30.0	12.0
11.0	75	30.0	12.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
11.5	75	30.0	12.0
12.0	75	30.0	12.0
14.0	80	30.0	14.0
16.0	100	45.0	16.0
18.0	100	45.0	18.0
20.0	100	45.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵Cast Iron 結構鋼鐵Structural Steels 碳素鋼Carbon Steels FC SS400 S45C		合金鋼Alloy Steels 工具鋼Tool Steels SCM SKS SKD		調質鋼Hardened Steels 預硬鋼Prehardened Steels SKT,SKD		不銹鋼Stainless Steels 調質鋼Hardened Steels SUS,SKD		調質鋼Hardened Steels 耐熱合金鋼Nickel Alloy		
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	60~85	50~70	35~50	25~35
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/ min	
	2	11200	280	9000	150	6000	90	3800	65	3600	45
3	7500	350	6500	200	4200	120	2500	100	2200	50	
4	5600	350	5000	280	3200	160	2000	140	1800	60	
5	5000	400	430	320	3000	180	1900	160	1600	70	
6	4200	420	3500	380	2500	220	1550	180	1300	85	
8	3100	500	2800	400	1900	280	1150	220	1000	100	
10	2500	550	2100	400	1500	280	950	220	800	100	
12	2100	550	1800	3600	1250	210	790	200	660	100	
16	1600	500	1350	320	950	180	580	160	520	75	
20	1200	500	1000	300	700	160	480	140	440	70	
切削深度值 Depth Of Cut	h=1.5D W=0.15D		h=1.5D W=0.1D		h=1D W=0.1D		h=1D W=0.05D		h=1D W=0.025D		
側銑削場合 Side Milling											

鎢鋼立銑刀

Solid Carbide End Mills

極細微粒碳化鎢長刃立銑刀 Micro Grain Carbide Long Flute End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

SUS

WE-4202

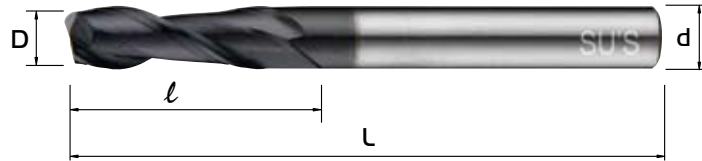
長2刃立銑刀 Long 2-Flute End Mills

適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
2.0	60	8.0	6.0
3.0	60	10.0	6.0
4.0	60	15.0	6.0
4.5	60	16.0	6.0
5.0	60	16.0	6.0
5.5	60	16.0	6.0
6.0	75	25.0	6.0
6.5	75	25.0	8.0
7.0	75	25.0	8.0
7.5	75	25.0	8.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
8.0	75	25.0	8.0
8.0	100	35.0	8.0
8.5	100	35.0	10.0
9.0	100	35.0	10.0
9.5	100	40.0	10.0
10.0	100	40.0	10.0
10.5	100	40.0	12.0
11.0	100	40.0	12.0
11.5	100	45.0	12.0
12.0	100	45.0	12.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
12.5	100	45.0	14.0
13.0	100	45.0	14.0
14.0	100	45.0	14.0
15.0	100	45.0	16.0
16.0	100	45.0	16.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵 Cast Iron 結構鋼鐵 Structural Steels 碳素鋼 Carbon Steels FC SS400 S45C		合金鋼 Alloy Steels 工具鋼 Tool Steels SCM SKS SKD		調質鋼 Hardened Steels 預硬鋼 Prehardened Steels SKT,SKD		不銹鋼 Stainless Steels 調質鋼 Hardened Steels SUS,SKD		調質鋼 Hardened Steels 耐熱合金鋼 Nickel Alloy		
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	50~70	35~50	20~35	12~25
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	
2	9000	90	5300	45	3000	30	1750	20	1450	10	
3	6500	100	4100	60	2500	45	1700	30	1050	15	
4	5600	120	3300	85	1900	50	1500	40	800	15	
5	4300	130	2900	100	1650	60	1300	50	650	20	
6	3500	150	2700	100	1500	70	1250	50	550	25	
8	2800	180	2000	110	1200	75	950	60	430	30	
10	2100	220	1650	110	900	80	800	60	350	30	
12	1800	220	1300	110	750	80	660	60	300	30	
14	1500	220	1150	100	650	80	580	50	250	25	
16	1300	220	1000	100	600	80	500	50	220	25	
切削深度值 Depth Of Cut	h=2.5D W=0.025D H=0.15D		h=2.5D W=0.025D H=0.15D		h=2.5D W=0.02D H=0.15D		h=2D W=0.015D H=0.05D		h=2D W=0.015D H=0.025D		
側銑削場合 Side Milling			槽銑削場合 Slotting			側銑場合進給速度可提高10%~15% Feed speed may be increased by 10-15% when performing side milling					

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢長刃立銑刀 Micro Grain Carbide Long Flute End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

WE-4402

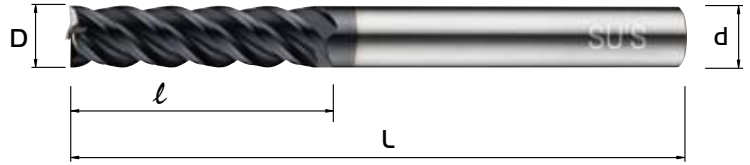
長4刃立銑刀 Long 4-Flute End Mills

適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
2.0	60	8.0	6.0
3.0	60	12.0	6.0
4.0	60	16.0	6.0
4.5	60	16.0	6.0
5.0	75	20.0	6.0
5.5	75	20.0	6.0
6.0	75	24.0	6.0
6.5	75	24.0	8.0
7.0	75	28.0	8.0
8.0	75	28.0	8.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
8.0	100	32.0	8.0
10.0	100	40.0	10.0
10.0	150	50.0	10.0
12.0	100	45.0	12.0
12.0	150	55.0	12.0
14.0	100	45.0	14.0
16.0	150	64.0	16.0
18.0	150	65.0	18.0
20.0	150	72.0	20.0
25.0	150	80.0	25.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵Cast Iron 結構鋼鐵Structural Steels 碳素鋼Carbon Steels FC SS400 S45C		合金鋼Alloy Steels 工具鋼Tool Steels SCM SKS SKD		調質鋼Hardened Steels 預硬鋼Prehardened Steels SKT,SKD		不銹鋼Stainless Steels 調質鋼Hardened Steels SUS,SKD		調質鋼Hardened Steels 耐熱合金鋼Nickel Alloy	
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50				
切削速度 Cutting Speed V m/min	50~70		35~50		20~35		12~25		10~15	
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
	2	9000	110	5300	80	3000	40	1750	30	1450
3	6500	180	4100	100	2500	55	1700	40	1050	23
4	5600	220	3300	120	1900	70	1500	50	800	28
5	4300	220	2900	150	1650	90	1300	60	650	35
6	3500	250	2700	180	1500	90	1250	75	550	40
8	2800	250	2000	200	1200	100	950	90	430	45
10	2100	250	1650	200	900	100	800	90	350	45
12	1800	250	1300	180	750	100	660	90	300	45
16	1500	200	1150	150	650	85	580	70	250	38
20	1300	180	1000	130	600	68	500	60	220	30
切削深度值 Depth Of Cut	h=3D W=0.05D		h=2.5D W=0.05D		h=2.5D W=0.05D		h=2D W=0.025D		h=2D W=0.02D	



鎢鋼立銑刀

Solid Carbide End Mills

極細微粒碳化鎢圓鼻立銑刀 Micro Grain Carbide Corner-Radius End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

SU'S

WE-4221

圓鼻2刃立銑刀 2-Flute Corner-Radius End Mills

適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、
預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy



直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	0.2	50	2.0	4.0
1.5	0.2	50	3.0	4.0
2.0	0.3	50	5.0	4.0
2.0	0.5	50	5.0	4.0
3.0	0.3	50	7.5	4.0
3.0	0.5	50	7.5	4.0
4.0	0.3	50	8.0	4.0
4.0	0.5	50	8.0	4.0
4.0	1.0	50	8.0	4.0
5.0	0.3	60	12.0	6.0

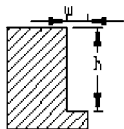
直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
5.0	0.5	60	12.0	6.0
5.0	1.0	60	12.0	6.0
6.0	0.3	75	20.0	6.0
6.0	0.5	75	20.0	6.0
6.0	1.0	75	20.0	6.0
8.0	0.3	75	25.0	8.0
8.0	0.5	75	25.0	8.0
8.0	1.0	75	25.0	8.0
10.0	0.5	75	30.0	10.0
10.0	1.0	75	30.0	10.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
10.0	1.5	75	30.0	10.0
10.0	2.0	75	30.0	10.0
12.0	1.0	75	30.0	12.0
12.0	1.5	75	30.0	12.0
12.0	2.0	75	30.0	12.0

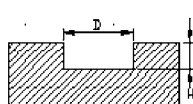
切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵Cast Iron 結構鋼鐵Structural Steels 碳素鋼Carbon Steels FC SS400 S45C		合金鋼Alloy Steels 工具鋼Tool Steels SCM SKS SKD		調質鋼Hardened Steels 預硬鋼Prehardened Steels SKT,SKD		不銹鋼Stainless Steels 調質鋼Hardened Steels SUS,SKD		調質鋼Hardened Steels 耐熱合金鋼Nickel Alloy	
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50				
切削速度 Cutting Speed V m/min	60~80		50~70		35~50		25~35		20~30	
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
	2	11200	200	8600	90	5600	60	3800	40	3500
3	7500	230	5800	120	4000	80	2500	60	2200	25
4	5600	230	5000	160	3000	90	2000	80	1600	35
5	500	230	4000	200	2600	110	1900	90	1500	40
6	4300	250	3200	260	2200	140	1550	120	1100	100
8	3200	300	2400	260	1600	150	1150	120	800	100
10	2600	300	1900	250	1300	150	950	120	650	100
12	2100	320	1600	250	1050	140	790	110	530	90
切削深度值 Depth Of Cut	h=1.5D W=0.1D H=0.3D		h=1.5D W=0.05D H=0.25D		h=1.5D W=0.05D H=0.25D		h=1.5D W=0.03D H=0.2D		h=1D W=0.03D H=0.2D	

側銑削場合
Side Milling



槽銑削場合
Slotting



側銑場合進給速度可提高10%~15%
Feed speed may be increased by 10-15% when performing side milling

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢圓鼻立銑刀 Micro Grain Carbide Corner-Radius End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

WE-4421

圓鼻4刃立銑刀 4-Flute Corner-Radius End Mills



適用材質：

鑄鐵、結構鋼鐵、碳素鋼、合金鋼、工具鋼、調質鋼、預硬鋼、不銹鋼、耐熱合金鋼

Applicable materials :

Cast Iron, Structural Steels, Carbon Steels, Alloy Steels, Tool Steels, Hardened Steels, Prehardened Steels, Stainless Steels, Nickel Alloy

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	0.3	50	7.5	4.0
3.0	0.5	50	7.5	4.0
4.0	0.3	50	10.0	4.0
4.0	0.5	50	10.0	4.0
4.0	1.0	50	10.0	4.0
5.0	0.3	60	12.0	6.0
5.0	0.5	60	12.0	6.0
5.0	1.0	60	12.0	6.0
6.0	0.3	75	20.0	6.0
6.0	0.5	75	20.0	6.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	1.0	75	20.0	6.0
8.0	0.3	75	25.0	8.0
8.0	0.5	75	25.0	8.0
8.0	1.0	75	25.0	8.0
10.0	0.5	75	30.0	10.0
10.0	1.0	75	30.0	10.0
10.0	1.5	75	30.0	10.0
10.0	2.0	75	30.0	10.0
12.0	1.0	75	30.0	12.0
12.0	1.5	75	30.0	12.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
12.0	2.0	75	30.0	12.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	鑄鐵Cast Iron 結構鋼鐵Structural Steels 碳素鋼Carbon Steels FC SS400 S45C		合金鋼Alloy Steels 工具鋼Tool Steels SCM SKS SKD		調質鋼Hardened Steels 預硬鋼Prehardened Steels SKT,SKD		不銹鋼Stainless Steels 調質鋼Hardened Steels SUS,SKD		調質鋼Hardened Steels 耐熱合金鋼Nickel Alloy		
	硬度 Hardness	抗張強度 ~750N/mm ²	~HRC30	HRC30~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	60~80	50~70	35~50	25~35
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	
3	7400	180	4500	110	4000	100	3600	80	1500	40	
4	6400	250	3800	145	3400	130	3000	115	1300	50	
5	5600	300	3400	180	3000	160	2700	140	1150	60	
6	5300	380	3200	220	2900	200	2500	180	1050	80	
8	4000	400	2400	230	2200	200	1900	180	800	80	
10	3200	400	1900	230	1650	200	1500	180	650	80	
12	2600	380	1600	210	1450	190	1250	170	550	75	
切削深度值 Depth Of Cut	h=1.5D W=0.15D H=0.3D		h=1.5D W=0.1D H=0.25D		h=1.5D W=0.1D H=0.25D		h=1D W=0.05D H=0.1D		h=1D W=0.05D H=0.1D		
側銑削場合 Side Milling			槽銑削場合 Slotting			側銑場合進給速度可提高10%~15% Feed speed may be increased by 10-15% when performing side milling					

鎢鋼立銑刀

Solid Carbide End Mills

極細微粒碳化鎢微小徑立銑刀 Micro Grain Carbide Micro-Diameter End Mills

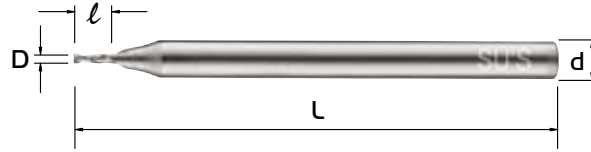
AlCrN 複合多層被覆
AlCrN multi layer Coated

SUS

WE-4241

微小徑2刃立銑刀 2-Flute Miniature End Mills

適用材質：
碳素鋼、低合金鋼、調質鋼

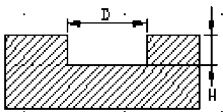


Applicable materials :
Carbon Steels, Low Alloy Steels, Prehardened Steels

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
0.3	38	1.0	3.0
0.4	38	1.0	3.0
0.5	38	1.5	3.0
0.6	38	1.5	3.0
0.7	38	2.0	3.0
0.8	38	2.0	3.0
0.9	38	2.5	3.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	碳素鋼 Carbon Steels		低合金鋼 Low Alloy Steels		調質鋼 Prehardened Steels		
硬度 Hardness	~HRC30		HRC30~40		HRC40~45		
切削速度 Cutting Speed V m/min	40~60		30~50		20~40		
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)
0.3	42500	110	31850	75	21200	60	0.018
0.4	31800	150	23850	90	15950	70	0.022
0.5	26000	230	19100	120	12750	95	0.025
0.6	22000	310	16000	180	10600	115	0.03
0.7	18500	360	13650	200	9100	120	0.034
0.8	16000	420	11950	230	7960	125	0.038
0.9	14500	500	10600	300	7100	125	0.042



鎢鋼立銑刀 Solid Carbide End Mills

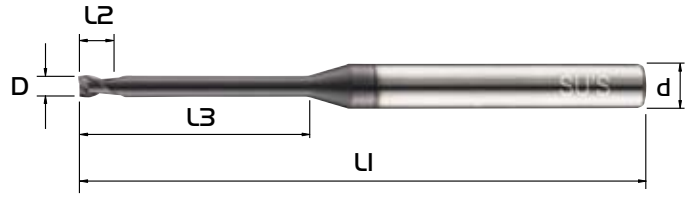
極細微粒碳化鎢長頸小徑立銑刀 Micro Grain Carbide Long-Neck Short-Flute End Mills

AICrN 複合多層被覆
AICrN multi layer Coated

WE-4251

長頸小徑 2 刃立銑刀
Long-Neck Short-Flute 2-Flute End Mills

適用材質：
碳素鋼、低合金鋼、調質鋼、合金鋼



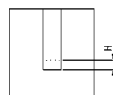
Applicable materials :
Carbon Steels, Low Alloy Steels, Prehardened Steels, Alloy Steels

直徑 D mm	全長 L1 mm	溝長 L2 mm	溝頸長 L3 mm	柄徑 d mm
1.0	60	1.5	5.0	4.0
1.0	60	1.5	7.5	4.0
1.0	60	1.5	10.0	4.0
1.5	60	1.5	7.5	4.0
1.5	60	1.5	10.0	4.0
1.5	60	1.5	15.0	4.0
2.0	60	2.3	10.0	4.0
2.0	60	2.3	15.0	4.0
2.0	60	2.3	20.0	4.0
2.5	60	3.0	12.5	4.0

直徑 D mm	全長 L1 mm	溝長 L2 mm	溝頸長 L3 mm	柄徑 d mm
2.5	60	3.0	18.5	4.0
2.5	60	3.0	25.0	4.0
3.0	75	3.5	15.0	6.0
3.0	75	3.5	20.0	6.0
3.0	75	3.5	30.0	6.0
4.0	75	4.5	20.0	6.0
4.0	75	4.5	30.0	6.0
4.0	75	4.5	40.0	6.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material		碳素鋼 Carbon Steels			低合金鋼 Low Alloy Steels			調質鋼 Prehardened Steels 合金鋼 Alloy Steels			
硬度 Hardness		HRC30			HRC30~35			HRC20~25			
切削速度 Cutting Speed V m/min		35~65			25~55			20~50			
銑刀外徑 Dia Of End Mill		回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	
D1.0	L3有效長(mm) (Length of Neck)	5	20000	430	0.04	18000	380	0.04	12000	300	0.03
		7.5	16000	280	0.03	13000	260	0.03	10000	240	0.02
		10	13500	250	0.02	10500	230	0.02	7200	200	0.02
D1.5	L3有效長(mm) (Length of Neck)	7.5	14000	410	0.05	10200	360	0.05	6800	280	0.04
		10	11000	260	0.04	8500	230	0.04	6000	200	0.03
		15	9000	230	0.02	8000	210	0.02	5100	160	0.02
D2.0	L3有效長(mm) (Length of Neck)	10	8500	360	0.06	7000	300	0.08	6000	250	0.06
		15	6800	280	0.05	5600	240	0.05	5000	200	0.04
		20	5500	230	0.04	4000	180	0.03	4000	140	0.03
D2.5	L3有效長(mm) (Length of Neck)	12.5	6800	420	0.08	5800	320	0.08	5000	260	0.06
		18.5	5500	340	0.06	4800	230	0.06	4000	210	0.04
		25	4500	250	0.04	3600	160	0.04	3100	150	0.03
D3.0	L3有效長(mm) (Length of Neck)	15	6000	430	0.12	4800	320	0.10	3500	280	0.08
		20	4600	350	0.08	3600	230	0.08	3000	210	0.06
		30	3800	260	0.06	3000	160	0.06	2500	120	0.04
D4.0	L3有效長(mm) (Length of Neck)	20	4600	410	0.15	3600	340	0.12	2800	250	0.10
		30	3800	280	0.12	2800	260	0.10	2500	180	0.08
		40	30000	220	0.08	2200	200	0.06	2000	110	0.05



WE-4601

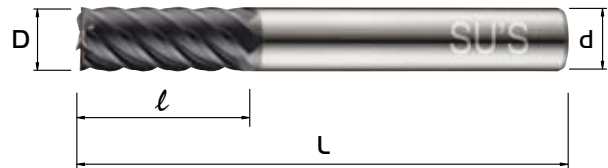
標準 6 刃立銑刀 Standard 6-Flute End Mills

適用材質：

碳素鋼、低合金鋼、調質鋼

Applicable materials :

Carbon Steels, Low Alloy Steels, Prehardened Steels



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	60	16.0	6.0
8.0	60	20.0	8.0
10.0	75	28.0	10.0
12.0	75	32.0	12.0
16.0	100	40.0	16.0
20.0	100	45.0	20.0

切削條件建議值 Recommended Milling Conditions

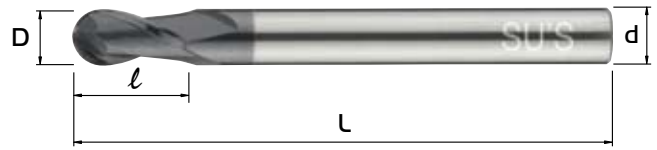
被削材 Work Material	碳素鋼 Carbon Steels		低合金鋼 Low Alloy Steels		調質鋼 Prehardened Steels	
硬度 Hardness	~HRC40		HRC40~45		HRC45~50	
切削速度 Cutting Speed V m/min	90~110		75~90		60~80	
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
6	5000	850	4000	400	3200	300
8	4000	900	3000	420	2400	350
10	3250	800	2600	450	1900	320
12	2700	700	2000	380	1600	300
16	2000	600	1500	280	1200	200
20	1600	450	1200	190	950	150
切削深度值 Depth Of Cut	h=1.5D W=0.12D		h=1.5D W=0.1D		h=1.0D W=0.05D	
側銑削場合 Side Milling						

WE-4211

球型2刃立銑刀 2-Flute Ball Nosed End Mills

適用材質：

碳鋼、低合金鋼、工具鋼、合金鋼、調質鋼、模具鋼、熱處理鋼



Applicable materials :

Carbon Steels, Low Alloy Steels, Tool Steels, Alloy Steels, Prehardened Steels, Mold Steels, Hardened Steels

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
1.0	0.5	50	2.0	4.0
1.5	0.75	50	3.0	4.0
2.0	1.0	50	4.0	4.0
2.5	1.25	50	5.0	4.0
3.0	1.5	50	6.0	4.0
4.0	2.0	50	8.0	4.0
5.0	2.5	60	10.0	6.0
5.5	2.75	60	11.0	6.0
6.0	3.0	60	12.0	6.0
7.0	3.5	60	12.0	8.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
8.0	4.0	60	16.0	8.0
8.0	4.0	75	16.0	8.0
9.0	4.5	75	18.0	10.0
10.0	5.0	75	20.0	10.0
12.0	6.0	75	20.0	12.0
14.0	7.0	80	24.0	14.0
16.0	8.0	100	24.0	16.0
20.0	10.0	150	30.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	破鋼Carbon Steels 低合金鋼Low Alloy Steels S45C SCM SKS		工具鋼Tool Steels 合金鋼Alloy Steels SCr SK SKT SNCM		調質鋼Prehardened Steels 模具鋼Mold Steels		調質鋼Prehardened Steels 熱處理鋼Hardened Steels		熱處理鋼Hardened Steels		
	硬度 Hardness	~HRC30	HRC30~35	HRC35~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	80~120	60~100	50~80	40~70
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	
D1 x 0.5R	32000	680	25500	580	2100	450	19000	330	12700	240	
D2 x 1R	16000	500	12700	400	10500	330	9500	250	6400	150	
D3 x 1.5R	11000	500	8500	400	6900	330	6500	250	4200	150	
D4 x 2R	8000	500	6400	300	5200	280	4800	250	3200	150	
D6 x 3R	5500	500	4200	300	3500	280	3200	250	2100	150	
D8 x 4R	4000	450	3200	300	2550	280	2400	200	1600	100	
D10 x 5R	3200	450	2500	300	2060	250	1900	200	1300	100	
D12 x 6R	2700	400	2100	250	1720	220	1600	200	1050	100	
D16 x 8R	2000	400	1600	250	1300	200	1200	150	800	100	
D20 x 10R	1600	400	1300	250	1030	180	1000	150	640	100	
切削深度值 Depth Of Cut	H=0.15R h=0.15R P=0.2R		H=0.15R h=0.15R P=0.15R		H=0.1R h=0.1R P=0.1R		H=0.08R h=0.06R P=0.1R		H=0.05R h=0.03R P=0.05R		
槽銑削場合 Slotting					形狀銑削場合 Profiling						

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢球型立銑刀 Micro Grain Carbide Ball Nosed End Mills

AlCrN 複合多層被覆
AlCrN multi layer Coated

WE-4411

球型4刃立銑刀 4-Flute Ball Nosed End Mills



適用材質：

碳鋼、低合金鋼、工具鋼、合金鋼、調質鋼、模具鋼、熱處理鋼

Applicable materials :

Carbon Steels, Low Alloy Steels, Tool Steels, Alloy Steels, Prehardened Steels, Mold Steels, Hardened Steels

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
6.0	3.0	60	12.0	6.0
6.0	3.0	75	12.0	6.0
8.0	4.0	75	16.0	8.0
10.0	5.0	75	20.0	10.0
10.0	5.0	100	20.0	10.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
12.0	6.0	100	20.0	12.0
14.0	7.0	100	24.0	14.0
16.0	8.0	100	24.0	16.0
20.0	10.0	150	30.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	碳鋼Carbon Steels 低合金鋼Low Alloy Steels S45C SCM SKS		工具鋼Tool Steels 合金鋼Alloy Steels SCr SK SKT SNCM		調質鋼Prehardened Steels 模具鋼Mold Steels		調質鋼Prehardened Steels 熱處理鋼Hardened Steels		熱處理鋼Hardened Steels	
	硬度 Hardness	~HRC30	HRC30~35	HRC35~40	HRC40~45	HRC45~50				
切削速度 Cutting Speed V m/min	80~120	60~100	50~80	40~70	30~50					
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
	D6 x 3R	5400	630	4200	400	3500	360	3200	2100	210
D8 x 4R	4000	630	3200	400	2550	360	2400	280	1600	160
D10 x 5R	3200	700	2500	450	2060	400	1900	280	1300	160
D12 x 6R	2700	700	2100	450	1720	400	1600	280	1050	160
D16 x 8R	2000	600	1600	400	1300	350	1200	260	800	150
D20 x 10R	1600	500	1300	350	1030	300	1000	220	640	140
切削深度值 Depth Of Cut	h=0.15R P=0.3R		h=0.1R P=0.3R		h=0.1R P=0.3R		h=0.05R P=0.2R		h=0.05R P=0.15R	
形狀銑削場合 Profiling										

鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢長柄球型立銑刀 Micro Grain Carbide Long-Shank Ball Nosed End Mills

AICrN 複合多層被覆
AICrN multi layer Coated

WE-4212

長柄 2 刃球型立銑刀
Long-Shank 2-Flute Ball Nosed End Mills



適用材質：

碳鋼、低合金鋼、工具鋼、合金鋼、調質鋼、模具鋼、熱處理鋼

Applicable materials :

Carbon Steels, Low Alloy Steels, Tool Steels, Alloy Steels, Prehardened Steels, Mold Steels, Hardened Steels

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
2.0	1.0	75	4.0	6.0
2.5	1.25	75	5.0	6.0
3.0	1.5	75	6.0	6.0
4.0	2.0	75	8.0	6.0
5.0	2.5	75	10.0	6.0
6.0	3.0	100	12.0	6.0
8.0	4.0	100	16.0	8.0
9.0	4.5	100	18.0	10.0
10.0	5.0	100	20.0	10.0
12.0	6.0	100	20.0	12.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
14.0	7.0	100	24.0	14.0
16.0	8.0	150	24.0	16.0
20.0	10.0	200	30.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	碳鋼Carbon Steels 低合金鋼Low Alloy Steels S45C SCM SKS		工具鋼Tool Steels 合金鋼Alloy Steels SCr SK SKT SNCM		調質鋼Prehardened Steels 模具鋼Mold Steels		調質鋼Prehardened Steels 熱處理鋼Hardened Steels		熱處理鋼Hardened Steels		
	硬度 Hardness	~HRC30	HRC30~35	HRC35~40	HRC40~45	HRC45~50	切削速度 Cutting Speed V m/min	80~120	60~100	50~80	40~70
銑刀外徑 Dia of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	
D1 x 0.5R	32000	680	25500	580	2100	450	19000	330	12700	240	
D2 x 1R	16000	500	12700	400	10500	330	9500	250	6400	150	
D3 x 1.5R	11000	500	8500	400	6900	330	6500	250	4200	150	
D4 x 2R	8000	500	6400	300	5200	280	4800	250	3200	150	
D6 x 3R	5500	500	4200	300	3500	280	3200	250	2100	150	
D8 x 4R	4000	450	3200	300	2550	280	2400	200	1600	100	
D10 x 5R	3200	450	2500	300	2060	250	1900	200	1300	100	
D12 x 6R	2700	400	2100	250	1720	220	1600	200	1050	100	
D16 x 8R	2000	400	1600	250	1300	200	1200	150	800	100	
D20 x 10R	1600	400	1300	250	1030	180	1000	150	640	100	
切削深度值 Depth Of Cut	H=0.15R h=0.15R P=0.2R	H=0.15R h=0.15R P=0.15R	H=0.1R h=0.1R P=0.1R	H=0.08R h=0.06R P=0.1R	H=0.05R h=0.03R P=0.05R						
槽銑削場合 Slotting					形狀銑削場合 Profiling						

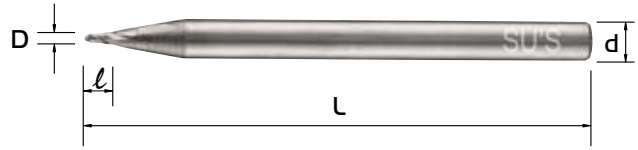
WE-4242

微小徑 2 刃球型立銑刀

Micro-Diameter 2-Flute Ball Nosed End Mills

適用材質：

碳素鋼、低合金鋼、調質鋼、合金鋼



Applicable materials :

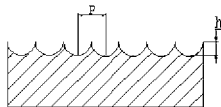
Carbon Steels, Low Alloy Steels, Prehardened Steels, Alloy Steels

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
0.5	0.25	38	0.8	3.0
0.6	0.30	38	0.9	3.0
0.7	0.35	38	1.0	3.0
0.8	0.40	38	1.2	3.0
0.9	0.45	38	1.3	3.0
1.0	0.50	38	1.5	3.0
1.2	0.60	38	1.8	3.0
1.4	0.70	38	2.0	3.0
1.5	0.75	38	2.3	3.0
1.6	0.80	38	2.5	3.0

直徑 D mm	R 徑 mm	全長 L mm	溝長 l mm	柄徑 d mm
1.8	0.90	38	2.7	3.0
2.0	1.00	38	3.0	3.0
2.5	1.25	38	3.7	3.0
3.0	1.50	38	4.5	3.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	碳素鋼 Carbon Steels		低合金鋼 Low Alloy Steels		調質鋼Prehardened Steels 合金鋼Alloy Steels		最大切削量 Max. Cutting Capacity h p	
	硬度 Hardness	~HRC30	HRC30~40	HRC40~45				
切削速度 Cutting Speed V m/min	40~60		30~50		20~40			
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min		
D0.5 x R0.25	26000	800	19100	650	12750	500	0.012	0.025
D0.6 x R0.3	22000	800	16000	650	10600	500	0.015	0.03
D0.7 x R0.35	18500	800	13650	650	9100	500	0.018	0.035
D0.8 x R0.4	16000	800	11950	650	7960	500	0.021	0.04
D0.9 x R0.45	14500	800	10600	650	7100	500	0.024	0.045
D1.0 x R0.5	13000	800	9550	650	6350	500	0.027	0.05



鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢長頸小徑球型立銑刀 Micro Grain Carbide Long-Neck Short Flute Ball Nosed End Mills

AICrN 複合多層被覆
AlCrN multi layer Coated

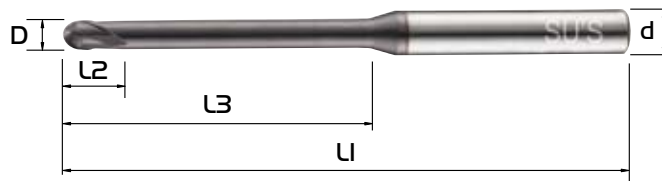
WE-4252

長頸小徑 2 刃球型立銑刀

Long-Neck Short Flute 2-Flute Ball Nosed End Mills

適用材質：

碳素鋼、低合金鋼、合金鋼、調質鋼



Applicable materials :

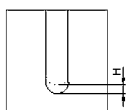
Carbon Steels, Low Alloy Steels, Alloy Steels, Prehardened Steels

直徑 D mm	R 徑 mm	全長 L1 mm	溝長 L2 mm	溝頸長 L3 mm	柄徑 d mm
1.0	0.5	60	1.5	5.0	4.0
1.0	0.5	60	1.5	10.0	4.0
1.5	0.75	60	1.5	7.5	4.0
1.5	0.75	60	1.5	15.0	4.0
2.0	1.0	60	2.3	10.0	4.0
2.0	1.0	60	2.3	15.0	4.0
2.0	1.0	60	2.3	20.0	4.0
2.5	1.25	60	3.0	12.5	4.0
2.5	1.25	60	3.0	18.5	4.0
2.5	1.25	60	3.0	25.0	4.0

直徑 D mm	R 徑 mm	全長 L1 mm	溝長 L2 mm	溝頸長 L3 mm	柄徑 d mm
3.0	1.5	75	3.5	15.0	6.0
3.0	1.5	75	3.5	20.0	6.0
3.0	1.5	75	3.5	30.0	6.0
4.0	2.0	75	4.5	20.0	6.0
4.0	2.0	75	4.5	30.0	6.0
4.0	2.0	75	4.5	40.0	6.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material		碳素鋼 Carbon Steels			低合金鋼 Low Alloy Steels			調質鋼 Prehardened Steels 合金鋼 Alloy Steels			
硬度 Hardness		~HRC30			HRC30~35			HRC20~25			
切削速度 Cutting Speed V m/min		45~80			35~60			25~50			
銑刀外徑 Dia Of End Mill		回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	回轉速 R.P.M.	進給速度 Feed mm/min	最大切削量 Max. Cutting Capacity H(mm)	
D1.0xR0.5	L3有效長(mm) (Length Of Neck)	5.0	20000	450	0.03	15600	350	0.03	13000	250	0.02
		10.0	16000	250	0.02	12000	220	0.02	10000	180	0.01
D1.5xR0.75	L3有效長(mm) (Length Of Neck)	7.5	12750	400	0.04	10000	350	0.04	7200	250	0.03
		15.0	9600	250	0.03	7680	220	0.03	5100	180	0.02
D2.0xR1.0	L3有效長(mm) (Length Of Neck)	10.0	10000	500	0.08	9200	450	0.06	6200	200	0.05
		15.0	8000	400	0.06	7100	380	0.04	5100	180	0.04
		20.0	7200	350	0.04	6000	250	0.03	4000	150	0.03
D2.5xR1.25	L3有效長(mm) (Length Of Neck)	12.5	8200	600	0.06	7200	550	0.06	6000	180	0.06
		18.5	7500	450	0.04	6000	410	0.05	4800	150	0.04
		25.0	6300	300	0.02	5200	220	0.03	3800	120	0.04
D3.0xR1.5	L3有效長(mm) (Length Of Neck)	15.0	7400	600	0.09	6400	520	0.08	4800	160	0.06
		20.0	6200	450	0.07	5100	380	0.06	3400	130	0.05
		30.0	5000	300	0.05	4200	200	0.05	2600	110	0.05
D4.0xR2.0	L3有效長(mm) (Length Of Neck)	20.0	5400	550	0.15	4800	500	0.10	3600	150	0.08
		30.0	4500	400	0.12	3840	350	0.08	2500	120	0.06
		40.0	3800	250	0.10	2880	200	0.06	1920	100	0.05



鎢鋼立銑刀

Solid Carbide End Mills

極細微粒碳化鎢鋁合金用立銑刀 Micro Grain Carbide For Aluminum Alloy Processing End Mills

Uncoated 無鍍層

SU'S

WE-4231

鋁合金用標準2刃立銑刀

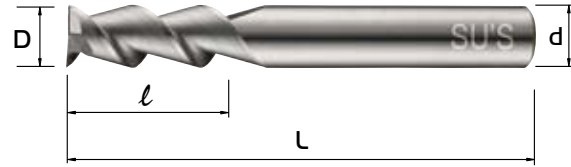
For Aluminum Alloy Processing, 2-Flute End Mills

適用材質：

純鋁、鋁合金銅鎂系列、鋁合金鋅鎂系列、鋁合金鎂系列、鋁合金鎂矽系列、鑄造鋁合金、壓鑄鋁合金、鋁合金矽系列

Applicable materials :

Pure Aluminum, Al Alloys(Cu-Mg), Al Alloys(Zn-Mg), Al Alloys(Mg), Al Alloys(Mg-Si), Castings Al Alloys, Al Alloys(Si)



直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	50	9.0	3.0
4.0	50	12.0	4.0
5.0	50	15.0	5.0
6.0	60	18.0	6.0
8.0	60	20.0	8.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
10.0	75	28.0	10.0
12.0	75	32.0	12.0
16.0	100	38.0	16.0
20.0	100	42.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	純鋁 Pure Aluminum 1070		鋁合金銅鎂系列 Al Alloys(Cu-Mg) 2014		鋁合金鋅鎂系列 Al Alloys(Zn-Mg) 7075		鋁合金鎂系列 Al Alloys(Mg) 5052		鋁合金鎂矽系列 Al Alloys(Mg-Si) 6061		鑄造鋁合金AC8C Castings Al Alloys 壓鑄鋁合金 A380 ADC10 Die Casting Al Alloys		鋁合金矽系列 Al Alloys(Si) 4032	
	Si 0.2%	Al 99.7%	Si 0.8%	Cu 4.4%	Si 0.35%	Zn 5.5%	Si 0.3~0.45%	Cr 0.35%	Si 0.5~0.8%	Si 8~10.5%	Si 12.5%	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
2.0	48000	800	40000	800	40000	500	24000	450	20000	400	9600	220	8000	200
3.0	32000	800	27000	800	27000	500	16000	500	13000	400	6400	250	5300	200
4.0	24000	1000	20000	1000	20000	600	12000	600	10000	500	4800	300	4000	250
5.0	19000	1000	16000	1000	16000	600	9600	600	8000	500	4000	300	3200	250
6.0	16000	1000	13500	1000	13500	600	8000	600	6500	500	3200	300	2650	250
8.0	12000	1000	10000	1000	10000	700	6000	7000	5000	600	2400	350	2000	300
10.0	9600	1200	8000	1200	8000	700	4800	700	4000	600	1900	350	1600	300
12.0	8000	1200	6600	1200	6600	700	4000	800	3300	700	1600	400	1300	350
16.0	6000	1200	5000	1200	5000	800	3000	800	2500	700	1300	400	1000	350
20.0	4800	1200	4000	1200	4000	800	2400	800	2000	700	1000	400	800	350
切削深度值 Depth Of Cut	h=1.5D w=0.2D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.1D H=1D		h=1.5D w=0.1D H=1D	
側銑削場合 Side Milling					槽銑削場合 Slotting									

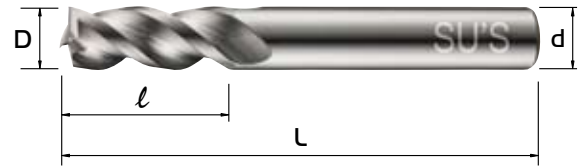
鎢鋼立銑刀 Solid Carbide End Mills

極細微粒碳化鎢鋁合金用立銑刀 Micro Grain Carbide For Aluminum Alloy Processing End Mills

Uncoated 無鍍層

WE-4331

鋁合金用標準3刃立銑刀
For Aluminum Alloy Processing, 3-Flute End Mills



適用材質：

純鋁、鋁合金銅鎂系列、鋁合金鋅鎂系列、鋁合金鎂系列、鋁合金鎂矽系列、鑄造鋁合金、壓鑄鋁合金、鋁合金矽系列

Applicable materials :

Pure Aluminum, Al Alloys(Cu-Mg), Al Alloys(Zn-Mg), Al Alloys(Mg), Al Alloys(Mg-Si), Castings Al Alloys, Al Alloys(Si)

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	50	9.0	3.0
4.0	50	12.0	4.0
6.0	60	18.0	6.0
8.0	60	20.0	8.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
10.0	75	28.0	10.0
12.0	75	32.0	12.0
16.0	100	38.0	16.0
20.0	100	42.0	20.0

切削條件建議值 Recommended Milling Conditions

被削材 Work Material	純鋁 Pure Aluminum 1070		鋁合金銅鎂系列 Al Alloys(Cu-Mg) 2014		鋁合金鋅鎂系列 Al Alloys(Zn-Mg) 7075		鋁合金鎂系列 Al Alloys(Mg) 5052		鋁合金鎂矽系列 Al Alloys(Mg-Si) 6061		鑄造鋁合金AC-8C Castings Al Alloys 壓鑄鋁合金 A380 ADC10 Die Casting Al Alloys		鋁合金矽系列 Al Alloys(Si) 4032	
	Si 0.2% Al 99.7%		Si 0.8% Cu 4.4%		Si 0.35% Zn 5.5%		Si 0.3~0.45% Cr 0.35%		Si 0.5~0.8%		Si 8~10.5%		Si 12.5%	
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
2.0	48000	800	40000	800	40000	500	24000	450	20000	400	9600	220	8000	200
3.0	32000	800	27000	800	27000	500	16000	500	13000	400	6400	250	5300	200
4.0	24000	1000	20000	1000	20000	600	12000	600	10000	500	4800	300	4000	250
5.0	19000	1000	16000	1000	16000	600	9600	600	8000	500	4000	300	3200	250
6.0	16000	1000	13500	1000	13500	600	8000	600	6500	500	3200	300	2650	250
8.0	12000	1000	10000	1000	10000	700	6000	7000	5000	600	2400	350	2000	300
10.0	9600	1200	8000	1200	8000	700	4800	700	4000	600	1900	350	1600	300
12.0	8000	1200	6600	1200	6600	700	4000	800	3300	700	1600	400	1300	350
16.0	6000	1200	5000	1200	5000	800	3000	800	2500	700	1300	400	1000	350
20.0	4800	1200	4000	1200	4000	800	2400	800	2000	700	1000	400	800	350
切削深度值 Depth Of Cut	h=1.5D w=0.2D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.15D H=1D		h=1.5D w=0.1D H=1D		h=1.5D w=0.1D H=1D	
側銑削場合 Side Milling			槽銑削場合 Slotting											

鎢鋼立銑刀

Solid Carbide End Mills

極細微粒碳化鎢鋁合金用長刃立銑刀 Micro Grain Carbide Long Length Of Cut For Aluminum Alloy Processing End Mills

Uncoated 無鍍層

SUS

WE-4232

鋁合金用長2刃立銑刀

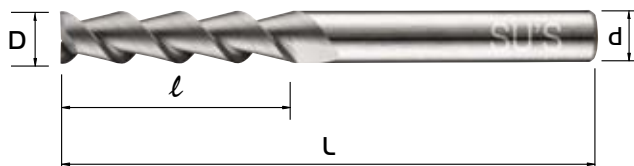
Long Length Of Cut For Aluminum Alloy Processing, 2-Flute End Mills

適用材質：

純鋁、鋁合金銅鎂系列、鋁合金鋅鎂系列、鋁合金鎂系列、
鋁合金鎂矽系列、鑄造鋁合金、壓鑄鋁合金、鋁合金矽系列

Applicable materials：

Pure Aluminum, Al Alloys(Cu-Mg), Al Alloys(Zn-Mg),
Al Alloys(Mg), Al Alloys(Mg-Si), Castings Al Alloys,
Al Alloys(Si)



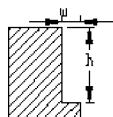
直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
3.0	60	12.0	6.0
4.0	60	16.0	6.0
5.0	60	20.0	6.0
6.0	75	25.0	6.0
8.0	75	32.0	8.0

直徑 D mm	全長 L mm	溝長 l mm	柄徑 d mm
10.0	100	45.0	10.0
12.0	100	45.0	12.0
16.0	150	65.0	16.0
20.0	150	75.0	20.0

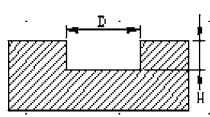
切削條件建議值 Recommended Milling Conditions

被削材 Work Material	純鋁 Pure Aluminum 1070		鋁合金銅鎂系列 Al Alloys(Cu-Mg) 2014		鋁合金鋅鎂系列 Al Alloys(Zn-Mg) 7075		鋁合金鎂系列 Al Alloys(Mg) 5052		鋁合金鎂矽系列 Al Alloys(Mg-Si) 6061		鑄造鋁合金AC8C Castings Al Alloys 壓鑄鋁合金 A380 ADC10 Die Casting Al Alloys		鋁合金矽系列 Al Alloys(Si) 4032	
	Si 0.2% Al 99.7%		Si 0.8% Cu 4.4%		Si 0.35% Zn 5.5%		Si 0.3~0.45% Cr 0.35%		Si 0.5~0.8%		Si 8~10.5%		Si 12.5%	
銑刀外徑 Dia Of End Mill	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min	回轉速 R.P.M.	進給速度 Feed mm/min
3.0	24000	400	19000	400	19000	320	15100	260	11200	250	5300	160	3800	85
4.0	16800	500	14000	500	14000	400	11200	320	8400	300	4000	200	2850	100
5.0	13300	500	11200	500	11200	400	9000	320	6700	300	3200	210	2200	100
6.0	11200	500	9500	500	9500	400	7560	320	5600	300	2650	210	1850	100
8.0	8400	500	7000	500	7000	400	5600	320	4200	350	2000	250	1350	150
10.0	6300	600	5600	600	5600	480	4500	340	3400	350	1600	250	1100	150
12.0	5600	600	4600	600	4600	480	3200	340	2800	350	1300	280	900	130
16.0	4200	500	3500	500	3500	420	2800	320	2100	400	1000	200	700	130
20.0	3400	500	2800	500	2800	420	2200	320	1700	350	800	200	550	130
切削深度值 Depth Of Cut	h=2.5D w=0.1D H=0.5D		h=2.5D w=0.1D H=0.5D		h=2.5D w=0.1D H=0.5D		h=2.5D w=0.1D H=0.5D		h=2.5D w=0.1D H=0.5D		h=2D w=0.1D H=0.5D		h=2D w=0.1D H=0.5D	

側銑削場合
Side Milling



槽銑削場合
Slotting



蘇氏全系列絲攻

最佳設計、性能卓越

SU'S TAPS Optimal Design! Outstanding Performance!

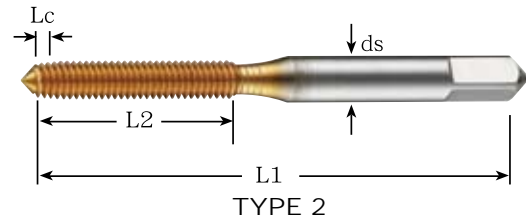
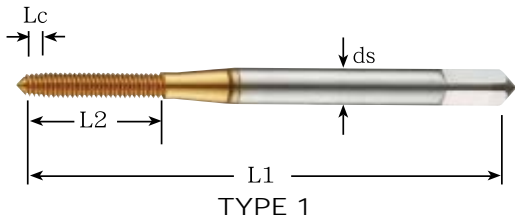
致力於精密工具設計製造的蘇氏公司。秉持優異的技術背景與先進的歐美加工設備，所生產的全系列絲攻，以高精度、高效率性能，深獲全球客戶的讚賞。蘇氏絲攻無論在倒牙部、溝形與螺紋牙長均經過特殊設計，可大幅提升加工效率，而且降低刀具消耗。優異的切屑排出設計，以及精緻的螺紋面，在在凸顯蘇氏絲攻的獨特性能風範。蘇氏公司採用一貫的製程，配合嚴格的品質檢驗，確保每一支絲攻都是高品質的保證。

SU'S PRECISION TOOLS CO., LTD. is a dedicated manufacturer of precision tools. Based on its outstanding technological background and a wide range of the most advanced European and American machining equipment, SU'S taps have been fully recognized by all customers around the world for their high accuracy and high efficiency. The lead threads, flute shape and thread length are specially designed, that greatly upgrade machining efficiency while reducing tool consumption. In addition, the outstanding chips exhaust design and extra fine thread flanks fully represent the exceptionally high performance of SU'S taps. At SU'S we implement integrated manufacturing process and conduct rigorous quality inspection. All these provide a quality guarantee for each tap from SU'S.

TiN粉末擠壓絲攻 - 長牙

TiN COATED ASP FORMING TAPS - LONG THREAD

FTL-82531



公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 1 × 0.25	4	P	1	31	5.5	3
M 1 × 0.25	4	B				
M 1 × 0.25	5	P				
M 1 × 0.25	5	B				
M 1.2 × 0.25	4	P	1	31	6	3
M 1.2 × 0.25	4	B				
M 1.2 × 0.25	5	P				
M 1.2 × 0.25	5	B				
M 1.4 × 0.3	4	P	1	34	6.5	3
M 1.4 × 0.3	4	B				
M 1.4 × 0.3	5	P				
M 1.4 × 0.3	5	B				
M 1.6 × 0.35	4	P	1	36	7	3
M 1.6 × 0.35	4	B				
M 1.6 × 0.35	5	P				
M 1.6 × 0.35	5	B				
M 1.7 × 0.35	4	P	1	36	10	3
M 1.7 × 0.35	4	B				
M 2 × 0.4	4	P	1	40	11	3
M 2 × 0.4	4	B				
M 2 × 0.4	5	P				
M 2 × 0.4	5	B				
M 2 × 0.4	6	P				
M 2 × 0.4	6	B				
M 2 × 0.4	7	B				
M 2.3 × 0.4	4	P	1	42	11	3
M 2.3 × 0.4	4	B				
M 2.3 × 0.4	5	P				
M 2.3 × 0.4	5	B				
M 2.5 × 0.45	4	P	1	44	15	3
M 2.5 × 0.45	4	B				
M 2.5 × 0.45	5	P				
M 2.5 × 0.45	5	B				
M 2.5 × 0.45	6	P				
M 2.5 × 0.45	6	B				
M 2.5 × 0.45	7	B				

公制牙

Metric Thread

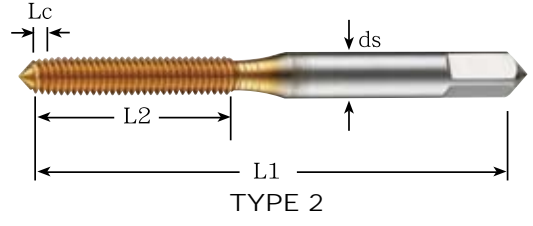
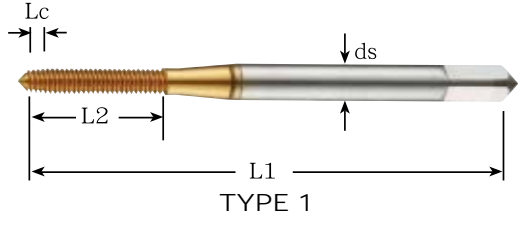
規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 2.6 × 0.45	4	P	1	44	15	3
M 2.6 × 0.45	4	B				
M 2.6 × 0.45	5	P				
M 2.6 × 0.45	5	B				
M 2.6 × 0.45	6	P				
M 2.6 × 0.45	6	B				
M 2.6 × 0.45	7	B				
M 3 × 0.5	4	P	2	46	18	4
M 3 × 0.5	4	B				
M 3 × 0.5	5	P				
M 3 × 0.5	5	B				
M 3 × 0.5	6	P				
M 3 × 0.5	6	B				
M 3 × 0.5	7	P				
M 3 × 0.5	7	B				
M 3 × 0.5	8	B				
M 3.5 × 0.6	6	P	2	48	18	4
M 3.5 × 0.6	6	B				
M 4 × 0.7	5	P	2	52	20	5
M 4 × 0.7	5	B				
M 4 × 0.7	6	P				
M 4 × 0.7	6	B				
M 4 × 0.7	7	P				
M 4 × 0.7	7	B				
M 5 × 0.8	6	P	2	60	22	5.5
M 5 × 0.8	6	B				
M 5 × 0.8	7	P				
M 5 × 0.8	7	B				
M 5 × 0.8	8	P				
M 5 × 0.8	8	B				
M 6 × 1	6	P	2	62	24	6
M 6 × 1	6	B				
M 6 × 1	7	P				
M 6 × 1	7	B				
M 6 × 1	8	P				
M 6 × 1	8	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山
 P: For through holes Chamfer: 4 thread
 B: For blind holes Chamfer: 2 thread

TiN粉末擠壓絲攻 - 長牙

TiN COATED ASP FORMING TAPS - LONG THREAD

FTL-82531



絲攻系列 TAPS Series

美制牙

U.S. Thread

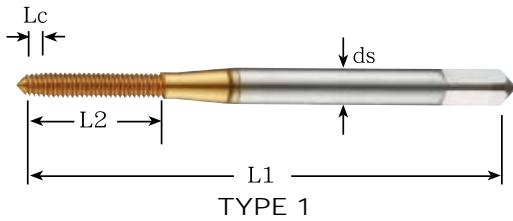
規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
NO. 0 - 80 UNF	4	P	1	36	10	3
NO. 0 - 80 UNF	4	B				
NO. 0 - 80 UNF	5	P				
NO. 0 - 80 UNF	5	B				
NO. 1 - 64 UNC	4	P	1	36	11	3
NO. 1 - 64 UNC	4	B				
NO. 1 - 64 UNC	5	P				
NO. 1 - 64 UNC	5	B				
NO. 1 - 72 UNF	4	P	1	36	11	3
NO. 1 - 72 UNF	4	B				
NO. 1 - 72 UNF	5	P				
NO. 1 - 72 UNF	5	B				
NO. 2 - 56 UNC	4	P	1	42	11	3
NO. 2 - 56 UNC	4	B				
NO. 4 - 40 UNC	5	P	2	44	12	3
NO. 4 - 40 UNC	5	B				
NO. 4 - 40 UNC	6	P				
NO. 4 - 40 UNC	6	B				
NO. 6 - 32 UNC	5	P	2	48	18	4
NO. 6 - 32 UNC	5	B				
NO. 6 - 32 UNC	6	P				
NO. 6 - 32 UNC	6	B				
NO. 6 - 32 UNC	7	P				
NO. 6 - 32 UNC	7	B				
NO. 8 - 32 UNC	5	P	2	52	20	5
NO. 8 - 32 UNC	5	B				
NO. 8 - 32 UNC	6	P				
NO. 8 - 32 UNC	6	B				
NO. 10 - 24 UNC	7	P	2	60	22	5.5
NO. 10 - 24 UNC	7	B				
NO. 10 - 32 UNF	7	P	2	60	22	5.5
NO. 10 - 32 UNF	7	B				
1/4 - 20 UNC	6	P				
1/4 - 20 UNC	6	B				
1/4 - 20 UNC	7	P	2	62	24	6
1/4 - 20 UNC	7	B				
1/4 - 28 UNF	5	P				
1/4 - 28 UNF	5	B				
1/4 - 28 UNF	7	P	2	62	24	6
1/4 - 28 UNF	7	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山
 P: For through holes Chamfer: 4 thread
 B: For blind holes Chamfer: 2 thread

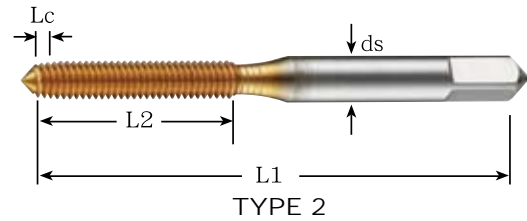
TiN 擠壓絲攻 - 長牙

TiN COATED FORMING TAPS - LONG THREAD

FTL-82531



TYPE 1



TYPE 2

公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 2 × 0.4	4	P	1	40	11	3
M 2 × 0.4	4	B				
M 2 × 0.4	5	P				
M 2 × 0.4	5	B				
M 2 × 0.4	6	P				
M 2 × 0.4	6	B				
M 2.3 × 0.4	4	P				
M 2.3 × 0.4	4	B				
M 2.3 × 0.4	5	P				
M 2.3 × 0.4	5	B				
M 2.5 × 0.45	4	P	1	44	15	3
M 2.5 × 0.45	4	B				
M 2.5 × 0.45	5	P				
M 2.5 × 0.45	5	B				
M 2.5 × 0.45	6	P				
M 2.5 × 0.45	6	B				
M 2.6 × 0.45	4	P	1	44	15	3
M 2.6 × 0.45	4	B				
M 2.6 × 0.45	5	P				
M 2.6 × 0.45	5	B				
M 2.6 × 0.45	6	P				
M 2.6 × 0.45	6	B				
M 3 × 0.5	4	P	2	46	18	4
M 3 × 0.5	4	B				
M 3 × 0.5	5	P				
M 3 × 0.5	5	B				
M 3 × 0.5	6	P				
M 3 × 0.5	6	B				
M 3 × 0.5	7	P				
M 3 × 0.5	7	B				
M 3.5 × 0.6	6	P	2	48	18	4
M 3.5 × 0.6	6	B				
M 4 × 0.7	5	P	2	52	20	5
M 4 × 0.7	5	B				
M 4 × 0.7	6	P				
M 4 × 0.7	6	B				
M 4 × 0.7	7	P				
M 4 × 0.7	7	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山

P: For through holes Chamfer: 4 thread

B: For blind holes Chamfer: 2 thread

公制牙

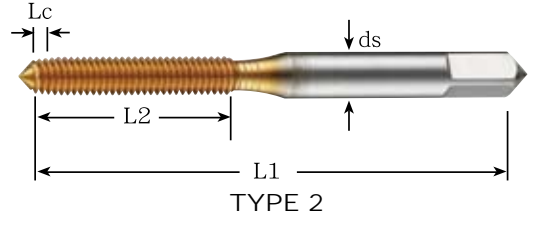
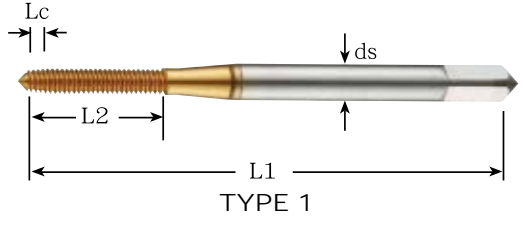
Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 5 × 0.8	6	P	2	60	22	5.5
M 5 × 0.8	6	B				
M 5 × 0.8	7	P				
M 5 × 0.8	7	B				
M 5 × 0.8	8	P				
M 5 × 0.8	8	B				
M 6 × 1	6	P				
M 6 × 1	6	B				
M 6 × 1	7	P				
M 6 × 1	7	B				
M 6 × 1	8	P				
M 6 × 1	8	B				

TiN 擠壓絲攻 - 長牙

TiN COATED FORMING TAPS - LONG THREAD

FTL-82531



絲攻系列 TAPS Series

美制牙

U.S. Thread

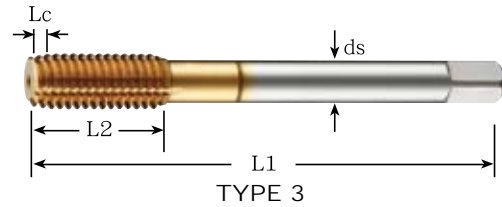
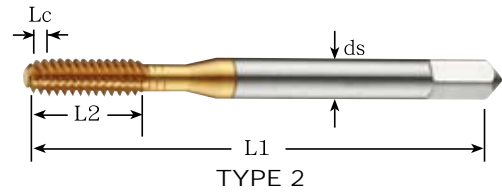
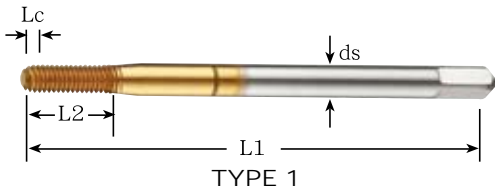
規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds				
NO. 4 - 40 UNC	5	P	2	44	12	3				
NO. 4 - 40 UNC	5	B								
NO. 4 - 40 UNC	6	P								
NO. 4 - 40 UNC	6	B								
NO. 6 - 32 UNC	5	P	2	48	18	4				
NO. 6 - 32 UNC	5	B								
NO. 6 - 32 UNC	6	P								
NO. 6 - 32 UNC	6	B								
NO. 6 - 32 UNC	7	P	2	52	20	5				
NO. 6 - 32 UNC	7	B								
NO. 8 - 32 UNC	5	P								
NO. 8 - 32 UNC	5	B								
NO. 8 - 32 UNC	6	P	2	60	22	5.5				
NO. 8 - 32 UNC	6	B								
NO. 10 - 24 UNC	7	P								
NO. 10 - 24 UNC	7	B								
NO. 10 - 32 UNF	7	P	2	60	22	5.5				
NO. 10 - 32 UNF	7	B								
1/4 - 20 UNC	6	P					2	62	24	6
1/4 - 20 UNC	6	B								
1/4 - 20 UNC	7	P								
1/4 - 20 UNC	7	B								
1/4 - 28 UNF	5	P	2	62	24	6				
1/4 - 28 UNF	5	B								
1/4 - 28 UNF	7	P								
1/4 - 28 UNF	7	B								

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山
 P: For through holes Chamfer: 4 thread
 B: For blind holes Chamfer: 2 thread

TiN 擠壓絲攻

TiN COATED FORMING TAPS

FT-82511



公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds								
M 1.7 × 0.35	3	P	1	36	8	3								
M 1.7 × 0.35	3	B												
M 1.7 × 0.35	4	P												
M 1.7 × 0.35	4	B												
M 2 × 0.4	3	P	1	40	8	3								
M 2 × 0.4	3	B												
M 2 × 0.4	4	P												
M 2 × 0.4	4	B												
M 2 × 0.4	5	P	1	42	8	3								
M 2 × 0.4	5	B												
M 2.3 × 0.4	5	P					1	44	10	3				
M 2.3 × 0.4	5	B												
M 2.5 × 0.45	4	P	1	44	10	3								
M 2.5 × 0.45	4	B												
M 2.5 × 0.45	6	P					1	44	10	3				
M 2.5 × 0.45	6	B												
M 2.6 × 0.45	4	P	1	44	10	3								
M 2.6 × 0.45	4	B												
M 2.6 × 0.45	6	P					1	44	10	3				
M 2.6 × 0.45	6	B												
M 3 × 0.5	4	P	2	46	10	4								
M 3 × 0.5	4	B												
M 3 × 0.5	5	P					2	46	10	4				
M 3 × 0.5	5	B												
M 3 × 0.5	6	P	2	46	10	4								
M 3 × 0.5	6	B												
M 3 × 0.5	7	B					2	48	10	4				
M 3.5 × 0.6	6	P									2	48	10	4
M 3.5 × 0.6	6	B	2	52	10	5								
M 4 × 0.7	5	P												
M 4 × 0.7	5	B					2	52	10	5				
M 4 × 0.7	6	P									2	52	10	5
M 4 × 0.7	6	B	2	52	10	5								
M 4 × 0.7	7	P												
M 4 × 0.7	7	B					2	60	11	5.5				
M 5 × 0.8	5	P									2	60	11	5.5
M 5 × 0.8	5	B	2	60	11	5.5								
M 5 × 0.8	6	P												
M 5 × 0.8	6	B												

公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds				
M 5 × 0.8	7	P	2	60	11	5.5				
M 5 × 0.8	7	B								
M 6 × 1	6	P	2	62	12	6				
M 6 × 1	6	B								
M 6 × 1	7	P								
M 6 × 1	7	B								
M 6 × 1	8	P	2	62	12	6				
M 6 × 1	8	B								
M 8 × 1.25	6	P					3	70	18	6.2
M 8 × 1.25	6	B								
M 8 × 1.25	7	P								
M 8 × 1.25	7	B								
M 8 × 1.25	8	P	3	70	18	6.2				
M 8 × 1.25	8	B								
M 8 × 1.0	6	P					3	70	18	6.2
M 8 × 1.0	6	B								
M 8 × 1.0	7	P								
M 8 × 1.0	7	B								
M 8 × 1.0	8	P	3	70	18	6.2				
M 8 × 1.0	8	B								
M 10 × 1.5	6	P					3	75	19	7
M 10 × 1.5	6	B								
M 10 × 1.5	7	P								
M 10 × 1.5	7	B								
M 10 × 1.5	8	P	3	75	19	7				
M 10 × 1.5	8	B								
M 10 × 1.25	6	P					3	75	19	7
M 10 × 1.25	6	B								
M 10 × 1.25	7	P								
M 10 × 1.25	7	B								
M 10 × 1.25	8	P	3	75	19	7				
M 10 × 1.25	8	B								

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山

P: For through holes Chamfer: 4 thread

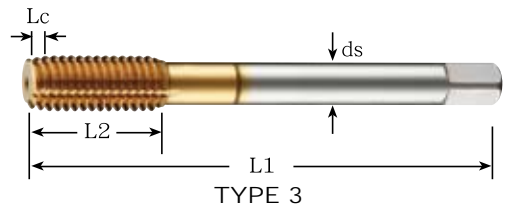
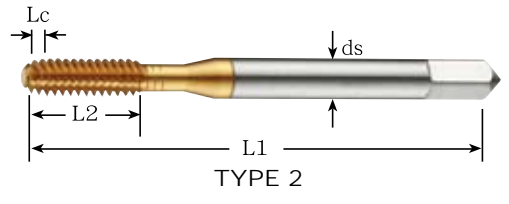
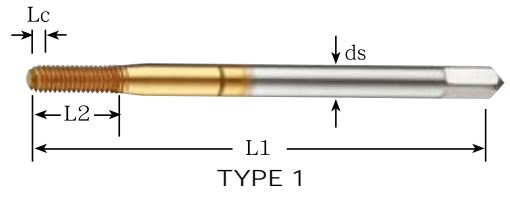
B: For blind holes Chamfer: 2 thread

TiN 擠壓絲攻

TiN COATED FORMING TAPS

絲攻系列 TAPS Series

FT-82511



公制牙 Metric Thread

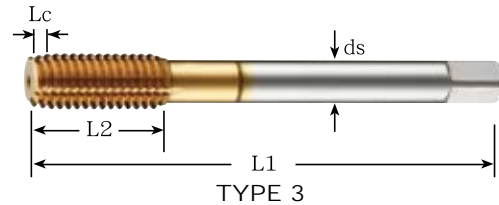
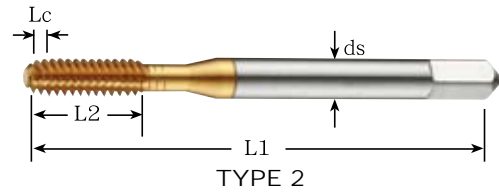
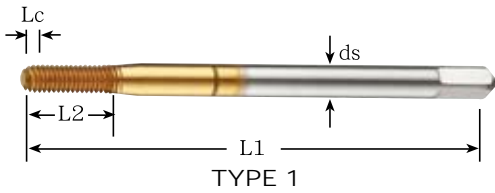
規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 12 × 1.75	7	P	3	82	23	8.5
M 12 × 1.75	7	B				
M 12 × 1.75	8	P				
M 12 × 1.75	8	B				
M 12 × 1.75	9	P				
M 12 × 1.75	9	B				
M 12 × 1.5	6	P	3	82	23	8.5
M 12 × 1.5	6	B				
M 12 × 1.5	7	P				
M 12 × 1.5	7	B				
M 12 × 1.5	8	P				
M 12 × 1.5	8	B				
M 12 × 1.25	6	P	3	82	23	8.5
M 12 × 1.25	6	B				
M 12 × 1.25	7	P				
M 12 × 1.25	7	B				
M 12 × 1.25	8	P				
M 12 × 1.25	8	B				
M 14 × 2	10	P	3	88	25	10.5
M 14 × 2	10	B				
M 14 × 1.5	9	P	3	88	25	10.5
M 14 × 1.5	9	B				
M 16 × 2	10	P	3	95	27	12.5
M 16 × 2	10	B				
M 16 × 1.5	9	P	3	95	27	12.5
M 16 × 1.5	9	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山
 P: For through holes Chamfer: 4 thread
 B: For blind holes Chamfer: 2 thread

TiN擠壓絲攻

TiN COATED FORMING TAPS

FT-82511



美制牙

U.S. Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
NO. 2 - 56 UNC	4	P	1	42	8	3
NO. 2 - 56 UNC	4	B				
NO. 4 - 40 UNC	4	P	2	44	9	3
NO. 4 - 40 UNC	4	B				
NO. 6 - 32 UNC	5	P	2	48	10	4
NO. 6 - 32 UNC	5	B				
NO. 6 - 32 UNC	6	P				
NO. 6 - 32 UNC	6	B				
NO. 8 - 32 UNC	5	P	2	52	10	5
NO. 8 - 32 UNC	5	B				
NO. 8 - 32 UNC	6	P				
NO. 8 - 32 UNC	6	B				
NO. 10 - 24 UNC	5	P	2	60	11	5.5
NO. 10 - 24 UNC	5	B				
NO. 10 - 24 UNC	6	P				
NO. 10 - 24 UNC	6	B				
NO. 10 - 24 UNC	7	P				
NO. 10 - 24 UNC	7	B				
NO. 10 - 32 UNF	5	P	2	60	11	5.5
NO. 10 - 32 UNF	5	B				
NO. 10 - 32 UNF	6	P				
NO. 10 - 32 UNF	6	B				
NO. 10 - 32 UNF	7	P				
NO. 10 - 32 UNF	7	B				
NO. 12 - 24 UNC	5	P	2	60	11	5.5
NO. 12 - 24 UNC	5	B				
NO. 12 - 24 UNC	6	P				
NO. 12 - 24 UNC	6	B				
NO. 12 - 24 UNC	7	P				
NO. 12 - 24 UNC	7	B				

美制牙

U.S. Thread

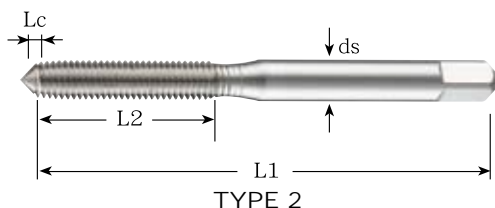
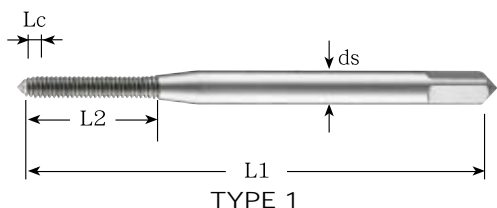
規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
1/4 - 20 UNC	6	P	2	62	14	6
1/4 - 20 UNC	6	B				
1/4 - 20 UNC	7	P				
1/4 - 20 UNC	7	B				
1/4 - 20 UNC	8	P				
1/4 - 20 UNC	8	B				
1/4 - 28 UNF	5	P	2	62	14	6
1/4 - 28 UNF	5	B				
1/4 - 28 UNF	6	P				
1/4 - 28 UNF	6	B				
1/4 - 28 UNF	7	P				
1/4 - 28 UNF	7	B				
5/16 - 18 UNC	7	P	3	70	18	6.1
5/16 - 18 UNC	7	B				
5/16 - 18 UNC	8	P				
5/16 - 18 UNC	8	B				
5/16 - 18 UNC	9	P				
5/16 - 18 UNC	9	B				
3/8 - 16 UNC	7	P	3	75	21	7
3/8 - 16 UNC	7	B				
3/8 - 16 UNC	8	P				
3/8 - 16 UNC	8	B				
3/8 - 16 UNC	9	P				
3/8 - 16 UNC	9	B				
1/2 - 20 UNF	8	P	3	85	25	9
1/2 - 20 UNF	8	B				
1/2 - 20 UNF	9	P				
1/2 - 20 UNF	9	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山
 P: For through holes Chamfer: 4 thread
 B: For blind holes Chamfer: 2 thread

非鐵合金用擠壓絲攻一長牙

FORMING TAPS FOR NON-FERROUS METALS - LONG THREAD

FTL-82031



公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 1 × 0.25	3	P	1	31	5.5	3
M 1 × 0.25	3	B				
M 1 × 0.25	4	P				
M 1 × 0.25	4	B				
M 1 × 0.25	5	P				
M 1 × 0.25	5	B				
M 1.2 × 0.25	3	P	1	31	6	3
M 1.2 × 0.25	3	B				
M 1.2 × 0.25	4	P				
M 1.2 × 0.25	4	B				
M 1.2 × 0.25	5	P				
M 1.2 × 0.25	5	B				
M 1.4 × 0.3	3	P	1	34	6.5	3
M 1.4 × 0.3	3	B				
M 1.4 × 0.3	4	P				
M 1.4 × 0.3	4	B				
M 1.4 × 0.3	5	P				
M 1.4 × 0.3	5	B				
M 1.6 × 0.35	3	P	1	36	7	3
M 1.6 × 0.35	3	B				
M 1.6 × 0.35	4	P				
M 1.6 × 0.35	4	B				
M 1.6 × 0.35	5	P				
M 1.6 × 0.35	5	B				
M 1.7 × 0.35	3	P	1	36	10	3
M 1.7 × 0.35	3	B				
M 1.7 × 0.35	4	P				
M 1.7 × 0.35	4	B				
M 1.7 × 0.35	5	P				
M 1.7 × 0.35	5	B				
M 2 × 0.4	3	P	1	40	11	3
M 2 × 0.4	3	B				
M 2 × 0.4	5	P				
M 2 × 0.4	5	B				
M 2.3 × 0.4	5	P	1	42	11	3
M 2.3 × 0.4	5	B				
M 2.5 × 0.45	6	P	1	44	15	3
M 2.5 × 0.45	6	B				
M 2.6 × 0.45	6	P	1	44	15	3
M 2.6 × 0.45	6	B				

公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 3 × 0.5	4	P	2	46	18	4
M 3 × 0.5	4	B				
M 3 × 0.5	6	P				
M 3 × 0.5	6	B	2	48	18	4
M 3.5 × 0.6	6	P				
M 3.5 × 0.6	6	B				
M 4 × 0.7	5	P	2	52	20	5
M 4 × 0.7	5	B				
M 4 × 0.7	7	P				
M 4 × 0.7	7	B	2	60	22	5.5
M 5 × 0.8	5	P				
M 5 × 0.8	5	B				
M 5 × 0.8	8	P	2	62	24	6
M 5 × 0.8	8	B				
M 6 × 1	5	P				
M 6 × 1	5	B	2	62	24	6
M 6 × 1	8	P				
M 6 × 1	8	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山

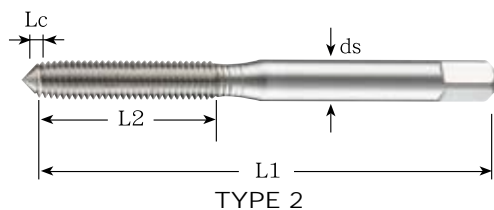
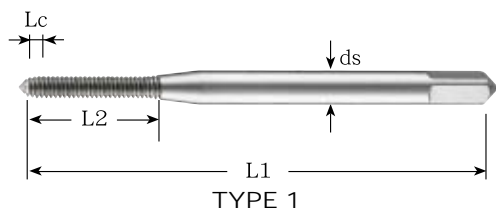
P: For through holes Chamfer: 4 thread

B: For blind holes Chamfer: 2 thread

非鐵合金用擠壓絲攻一長牙

FORMING TAPS FOR NON-FERROUS METALS - LONG THREAD

FTL-82031



美制牙

U.S. Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds				
NO. 0 - 80 UNF	3	P	1	36	10	3				
NO. 0 - 80 UNF	3	B								
NO. 0 - 80 UNF	4	P								
NO. 0 - 80 UNF	4	B								
NO. 0 - 80 UNF	5	P	1	36	11	3				
NO. 0 - 80 UNF	5	B								
NO. 1 - 64 UNC	3	P								
NO. 1 - 64 UNC	3	B								
NO. 1 - 64 UNC	4	P	1	36	11	3				
NO. 1 - 64 UNC	4	B								
NO. 1 - 64 UNC	5	P								
NO. 1 - 64 UNC	5	B								
NO. 1 - 72 UNF	3	P	1	36	11	3				
NO. 1 - 72 UNF	3	B								
NO. 1 - 72 UNF	4	P								
NO. 1 - 72 UNF	4	B								
NO. 1 - 72 UNF	5	P	1	36	11	3				
NO. 1 - 72 UNF	5	B								
NO. 2 - 56 UNC	5	P					1	42	11	3
NO. 2 - 56 UNC	5	B								
NO. 4 - 40 UNC	4	P	2	44	12	3				
NO. 4 - 40 UNC	4	B								
NO. 4 - 40 UNC	5	P								
NO. 4 - 40 UNC	5	B								
NO. 6 - 32 UNC	4	P	2	48	18	4				
NO. 6 - 32 UNC	4	B								
NO. 6 - 32 UNC	6	P								
NO. 6 - 32 UNC	6	B								
NO. 8 - 32 UNC	4	P	2	52	20	5				
NO. 8 - 32 UNC	4	B								
NO. 8 - 32 UNC	6	P								
NO. 8 - 32 UNC	6	B								
NO. 10 - 24 UNC	5	P	2	60	22	5.5				
NO. 10 - 24 UNC	5	B								
NO. 10 - 24 UNC	7	P								
NO. 10 - 24 UNC	7	B								
NO. 10 - 32 UNF	4	P	2	60	22	5.5				
NO. 10 - 32 UNF	4	B								
NO. 10 - 32 UNF	7	P								
NO. 10 - 32 UNF	7	B								

美制牙

U.S. Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
1/4 - 20 UNC	5	P	2	62	24	6
1/4 - 20 UNC	5	B				
1/4 - 20 UNC	8	P				
1/4 - 20 UNC	8	B				
1/4 - 28 UNF	5	P	2	62	24	6
1/4 - 28 UNF	5	B				
1/4 - 28 UNF	8	P				
1/4 - 28 UNF	8	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山

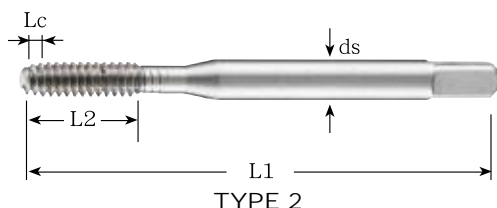
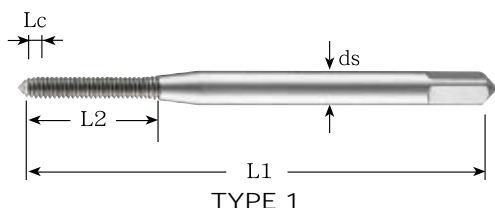
P: For through holes Chamfer: 4 thread

B: For blind holes Chamfer: 2 thread

非鐵合金用擠壓絲攻

FORMING TAPS FOR NON-FERROUS METALS

FT-82011



絲攻系列 TAPS Series

公制牙

Metric Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
M 1.7 × 0.35	5	P	1	36	8	3
M 1.7 × 0.35	5	B				
M 2 × 0.4	5	P	1	40	8	3
M 2 × 0.4	5	B				
M 2.3 × 0.4	5	P	1	42	8	3
M 2.3 × 0.4	5	B				
M 2.5 × 0.45	5	P	1	44	10	3
M 2.5 × 0.45	5	B				
M 2.6 × 0.45	6	P	1	44	10	3
M 2.6 × 0.45	6	B				
M 3 × 0.5	6	P	2	46	10	4
M 3 × 0.5	6	B				
M 3.5 × 0.6	6	P	2	48	10	4
M 3.5 × 0.6	6	B				
M 4 × 0.7	7	P	2	52	10	5
M 4 × 0.7	7	B				
M 5 × 0.8	8	P	2	60	11	5.5
M 5 × 0.8	8	B				
M 6 × 1	8	P	2	62	12	6
M 6 × 1	8	B				

美制牙

U.S. Thread

規格 Size	精度 SR	倒牙 LC	形狀 Type	全長 L1	牙長 L2	柄徑 ds
NO. 2 - 56 UNC	5	P	1	42	8	3
NO. 2 - 56 UNC	5	B				
NO. 4 - 40 UNC	5	P	2	44	9	3
NO. 4 - 40 UNC	5	B				
NO. 6 - 32 UNC	6	P	2	48	10	4
NO. 6 - 32 UNC	6	B				
NO. 8 - 32 UNC	6	P	2	52	10	5
NO. 8 - 32 UNC	6	B				
NO. 10 - 24 UNC	7	P	2	60	11	5.5
NO. 10 - 24 UNC	7	B				
NO. 10 - 32 UNF	7	P	2	60	11	5.5
NO. 10 - 32 UNF	7	B				
1/4 - 20 UNC	8	P	2	62	14	6
1/4 - 20 UNC	8	B				
1/4 - 28 UNF	7	P	2	62	14	6
1/4 - 28 UNF	7	B				

P: 通孔用 倒牙: 4山 B: 盲孔用 倒牙: 2山

P: For through holes Chamfer: 4 thread

B: For blind holes Chamfer: 2 thread

螺旋絲攻系列 TAP SERIES

SFT螺旋絲攻

POT先端絲攻

SFT Spiral Flute Taps

POT Spiral Point Taps



TAP-501

公制牙 M Metric Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
※ 2 x 0.4	40	15	3	3	2
※ 2.3 x 0.4	42	15	3	3	2
※ 2.5 x 0.45	44	16	3	3	2
※ 2.6 x 0.45	44	16	3	3	2
※M 3 x 0.6	46	18	4	3	3
※ 3 x 0.5	46	18	4	3	3
3 x 0.35	46	10	4	3	3
※ 3.5 x 0.6	48	18	4	3	3
3.5 x 0.35	48	10	4	3	3
※M 4 x 0.75	52	20	5	3	3
※ 4 x 0.7	52	20	5	3	3
4 x 0.5	52	15	5	3	3
※ 4.5 x 0.75	55	20	5	3	3
※M 5 x 0.9	60	22	5.5	3	3
※ 5 x 0.8	60	22	5.5	3	3
5 x 0.5	52	15	5.5	3	3
※ 5.5 x 0.9	60	22	5.5	3	3
5.5 x 0.5	52	15	5.5	3	3
※M 6 x 1	62	24	6	3	3
6 x 0.75	62	20	6	3	3
6 x 0.5	55	15	6	3	3
※ 7 x 1	65	26	6.2	3	3
7 x 0.75	62	20	6.2	3	3
8 x 1.25	70	30	6.2	3	3
8 x 1	70	30	6.2	3	3
8 x 0.75	62	20	6.2	3	3
9 x 1.25	72	30	7	3	3
9 x 1	70	30	7	3	3
9 x 0.75	62	20	7	3	3
10 x 1.5	75	32	7	3	3
10 x 1.25	75	32	7	3	3
10 x 1	70	30	7	3	3
10 x 0.75	62	20	7	3	3
※M 11 x 1.5	80	38	8	3	3
11 x 1	70	30	8	3	3
※ 12 x 1.75	82	38	8.5	3	3
12 x 1.5	82	38	8.5	3	3

TAP-511

公制牙 M Metric Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
M 12 x 1.25	80	38	8.5	3	3
12 x 1	70	30	8.5	3	3
※ 14 x 2	88	42	10.5	3	3
14 x 1.5	88	42	10.5	3	3
14 x 1.25	88	42	10.5	3	3
M 14 x 1	70	30	10.5	3	4
15 x 1.5	90	42	10.5	3	3
15 x 1	70	30	10.5	3	4
※ 16 x 2	95	45	12.5	3	3
16 x 1.5	95	45	12.5	3	3
M 16 x 1	75	30	12.5	3	4
17 x 1.5	95	45	13	3	3
17 x 1	80	30	13	3	4
※ 18 x 2.5	100	48	14	3	3
18 x 2	95	45	14	3	3
M 18 x 1.5	95	45	14	3	3
18 x 1	80	30	14	3	4
※ 20 x 2.5	105	50	15	4	3
20 x 2	95	45	15	4	3
20 x 1.5	95	45	15	4	3
M 20 x 1	80	30	15	4	4
※ 22 x 2.5	115	55	17	4	3
22 x 2	95	45	17	4	4
22 x 1.5	95	45	17	4	4
22 x 1	85	30	17	4	4
M 24 x 3	120	58	19	4	3
24 x 2	95	45	19	4	4
24 x 1.5	95	45	19	4	4
24 x 1	90	30	19	4	4
25 x 2	95	45	19	4	4
M 25 x 1.5	95	45	19	4	4
26 x 1.5	95	45	20	4	4
※ 27 x 3	130	62	20	4	4
27 x 2	95	45	20	4	4
27 x 1.5	95	45	20	4	4
M 28 x 2	105	45	21	4	4
28 x 1.5	105	45	21	4	4
※ 30 x 3.5	135	65	23	4	4
30 x 3	135	65	23	4	4
30 x 2	105	45	23	4	4
M 30 x 1.5	105	45	23	4	4
※ 33 x 3.5	145	70	25	4	4
※ 36 x 4	155	75	28	4	4
36 x 1.5	110	45	28	⊙	4
※M 42 x 4.5	175	85	32	4	4
※ 45 x 4.5	180	85	35	4	4
※ 48 x 5	185	95	38	4	4

註：打※號則表示為粗牙規格

Note: Items marked with※are coarse threads.

螺旋絲攻系列 TAP Series

SFT螺旋絲攻

POT先端絲攻

SFT Spiral Flute Taps



TAP-501

美制粗牙 UNC U.S. Coarse Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
No. 2 - 56 UNC	42	15	3	3	2
No. 3 - 48	44	16	3	3	2
No. 4 - 40	44	16	3	3	2
No. 5 - 40	46	18	4	3	3
No. 6 - 32	48	18	4	3	3
No. 8 - 32 UNC	52	20	5	3	3
No. 10 - 24	60	22	5.5	3	3
No. 12 - 24	60	22	5.5	3	3
1/4 - 20	62	24	6	3	3
5/16 - 18	70	30	6.1	3	3
3/8 - 16 UNC	75	35	7	3	3
7/16 - 14	80	38	8	3	3
1/2 - 13	85	42	9	3	3
9/16 - 12	90	42	10.5	3	3
5/8 - 11	95	45	12	3	3
3/4 - 10 UNC	105	50	14	3	3
7/8 - 9	115	55	17	4	4
1 - 8	125	60	20	4	4

英制牙 W Imperial Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
W 1/8 - 40	46	18	4	3	3
5/32 - 32	52	20	5	3	3
3/16 - 24	60	22	5.5	3	3
1/4 - 20	62	24	6	3	3
5/16 - 18	70	30	6.1	3	3
W 3/8 - 16	75	35	7	3	3
7/16 - 14	80	38	8	3	3
1/2 - 12	85	42	9	3	3
9/16 - 12	90	42	10.5	3	3

SPIRAL FLUTE TAPS螺旋絲攻

1. SFT具有約39°之螺旋角在攻牙加工時，能把切屑順暢排出孔外。
2. 適用於深孔及盲孔，切削屑能連續性排出，如碳素鋼及合金鋼等的攻牙作業。
3. 形狀寸法，螺紋部份的精度根據手絞絲攻為基準，導牙部的長度為2.5牙。

SPIRAL FLUTE TAPS

1. The SFT series is designed with about 39° helical angle, which permits smooth chips exhaust during tapping.
2. Suitable for tapping deep holes and blind holes with continuous chips exhaust. Applicable materials include carbon steel and alloy steel.
3. Accuracy of shapes, sizes and threads are based on hand tap. Lead thread length is 2.5 threads.

POT Spiral Point Taps



TAP-511

美制細牙 UNF U.S. Fine Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
No. 2 - 64 UNF	42	15	3	⊙	2
No. 3 - 56	44	16	3	⊙	2
No. 4 - 48	44	16	3	3	2
No. 5 - 44	46	18	4	3	3
No. 6 - 40	48	18	4	3	3
No. 8 - 36 UNF	52	20	5	3	3
No. 10 - 32	60	22	5.5	3	3
No. 12 - 28	60	22	5.5	3	3
1/4 - 28	62	24	6	3	3
5/16 - 24	70	30	6.1	3	3
3/8 - 24 UNF	75	32	7	3	3
7/16 - 20	80	38	8	3	3
1/2 - 20	85	42	9	3	3
9/16 - 18	90	42	10.5	3	3
5/8 - 18	95	45	12	3	3
3/4 - 16 UNF	95	45	14	3	3
7/8 - 14	95	45	17	4	4
1 - 12	95	45	20	4	4

英制牙 W Imperial Thread	全長 L mm	螺紋長ℓ mm	柄徑d mm	溝數Flutes	
				SFT	POT
W 5/8 - 11	95	45	12	3	3
3/4 - 10	105	50	14	3	3
7/8 - 9	115	55	17	4	4
1 - 8	125	60	20	4	4
1-1/8 - 7	135	65	22	4	4
W 1-1/4 - 7	145	70	24	4	4
1-1/2 - 6	160	78	30	4	4
2 - 4-1/2	195	90	40	4	⊙

SPIRAL POINT TAPS先端絲攻

1. POT經設計在切削部的溝槽中，具有一左旋切面使切屑順暢向前排出，沒有堵塞的困擾。
2. 切削銳利的關係，能加工出穩定的母螺紋；在深孔的通孔中，能發揮很大的效果。
3. 倒牙部的長度為4牙。

SPIRAL POINT TAPS

1. The POT series is designed with left helical cutting face in the cutting flute, which allows chips exhaust forward without jamming problem.
2. The sharp cutting performance produces consistent female threads and is excellent for deep hole tapping.
3. Chamfer length is 4 threads.

螺旋絲攻系列

S系列螺旋絲攻SSP

TAP Series

S Series Spiral Flute Taps SSP

SUS



TAP-502

公制牙 M Metric Thread	全長 L mm	螺紋長 ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
*M 2 x 0.4	40	8	3	3	GT3
* 2.3 x 0.4	42	9.5	3	3	GT3
* 2.5 x 0.45	44	9.5	3	3	GT3
* 2.6 x 0.45	44	9.5	3	3	GT3
* 3 x 0.5	46	5	4	3	GT6
* 3.5 x 0.6	48	6	4	3	GT6
* 4 x 0.75	52	7	5	3	GT6
* 4 x 0.7	52	7	5	3	GT6
M 4 x 0.5	52	7	5	3	GT6
* 4.5 x 0.75	52	7	5	3	GT6
* 5 x 0.9	60	8	5.5	3	GT6
* 5 x 0.8	60	8	5.5	3	GT6
5 x 0.5	60	8	5.5	3	GT6
* 6 x 1	62	10	6	3	GT6
6 x 0.75	62	10	6	3	GT6
6 x 0.5	62	10	6	3	GT6
*M 7 x 1	65	10	6.2	3	GT6
7 x 0.75	65	10	6.2	3	GT6
* 8 x 1.25	70	12	6.2	3	GT7
8 x 1	70	12	6.2	3	GT7
8 x 0.75	70	12	6.2	3	GT7
M 8 x 0.5	70	12	6.2	3	GT6
* 9 x 1.25	72	12	7	3	GT7
9 x 1	72	12	7	3	GT7
* 10 x 1.5	75	15	7	3	GT7
M 10 x 1.25	75	15	7	3	GT7
10 x 1	75	15	7	3	GT7
10 x 0.75	75	15	7	3	GT7
10 x 0.5	75	15	7	3	GT6
* 12 x 1.75	82	17	8.5	3	GT8
12 x 1.5	82	17	8.5	3	GT8
12 x 1.25	82	17	8.5	3	GT8
M 12 x 1	82	17	8.5	3	GT8
* 14 x 2	88	20	10.5	3	GT8
14 x 1.5	88	20	10.5	3	GT8

公制牙 M Metric Thread	全長 L mm	螺紋長 ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
M 14 x 1.25	88	20	10.5	3	GT8
14 x 1	88	20	10.5	3	GT8
15 x 1.5	90	15	10.5	3	GT8
*M 16 x 2	95	20	12.5	3	GT8
16 x 1.5	95	20	12.5	3	GT8
16 x 1	95	20	12.5	3	GT8
17 x 1.5	95	15	13	3	GT8
17 x 1	95	15	13	3	GT8
*M 18 x 2.5	100	25	14	3	GT9
18 x 2	100	25	14	3	GT9
18 x 1.5	100	25	14	3	GT8
18 x 1	100	25	14	3	GT8
* 20 x 2.5	105	25	15	4	GT9
M 20 x 2	105	25	15	4	GT9
20 x 1.5	105	25	15	4	GT8
20 x 1	105	25	15	4	GT8
22 x 2.5	115	25	17	4	GT9
22 x 2	115	25	17	4	GT9
M 22 x 1.5	115	25	17	4	GT8
22 x 1	115	25	17	4	GT8
* 24 x 3	120	30	19	4	GT9
24 x 2	120	30	19	4	GT9
24 x 1.5	120	30	19	4	GT8
M 24 x 1	120	30	19	4	GT8
25 x 2	125	20	19	4	GT9
25 x 1.5	125	20	19	4	GT8
26 x 1.5	125	20	20	4	GT8
*M 27 x 3	130	30	20	4	GT9
27 x 2	130	30	20	4	GT9
27 x 1.5	130	30	20	4	GT8
28 x 2	130	20	21	4	GT9
28 x 1.5	130	20	21	4	GT8
*M 30 x 3.5	135	35	23	4	GT9
30 x 1.5	135	35	23	4	GT8

註：打*號則表示為粗牙規格

Note: Items marked with * are coarse threads.

S 系列螺旋、先端絲攻

導牙部、溝形、螺紋牙長，均經過特殊設計，專業考量完成的新產品。
提高您加工的效率，降低刀具的消耗。

S SERIES SPIRAL FLUTE TAPS

The chamfer, flute shape and thread length are specially designed.
These newly developed products will help increase machining efficiency
while reducing tool consumption.

螺旋絲攻系列

S系列螺旋絲攻SSP

TAP SERIES

S Series Spiral Flute Taps SSP



TAP-502

美制粗牙 UNC U.S. Coarse Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
No. 4 - 40 UNC	44	11	3	3	GT5
No. 5 - 40	46	7	4	3	GT5
No. 6 - 32	48	8	4	3	GT5
No. 8 - 32	52	8	5	3	GT5
No. 10 - 24	60	11	5.5	3	GT6
No. 12 - 24 UNC	60	11	5.5	3	GT6
1/4 - 20	62	13	6	3	GT7
5/16 - 18	70	14	6.1	3	GT7
3/8 - 16	75	16	7	3	GT8
7/16 - 14	80	18	8	3	GT8
1/2 - 13 UNC	85	20	9	3	GT8
9/16 - 12	90	21	10.5	3	GT8
5/8 - 11	95	23	12	3	GT9
3/4 - 10	105	25	14	3	GT9
7/8 - 9	115	28	17	4	GT9
1 - 8	125	32	20	4	GT9

美制細牙 UNF U.S. Fine Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
No. 4 - 48 UNF	44	11	3	3	GT5
No. 5 - 44	46	7	4	3	GT5
No. 6 - 40	48	8	4	3	GT5
No. 8 - 36	52	8	5	3	GT5
No. 10 - 32	60	11	5.5	3	GT5
1/4 - 28 UNF	62	13	6	3	GT6
5/16 - 24	70	14	6.1	3	GT7
3/8 - 24	75	16	7	3	GT7
7/16 - 20	80	18	8	3	GT8
1/2 - 20	85	20	9	3	GT8
9/16 - 18 UNF	90	21	10.5	3	GT8
5/8 - 18	95	23	12	3	GT8
3/4 - 16	105	25	14	3	GT8
7/8 - 14	115	28	17	4	GT9
1 - 12	125	32	20	4	GT9

英制牙 W Imperial Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
W 1/8 - 20	46	7	4	3	GT5
5/32 - 32	52	8	5	3	GT5
3/16 - 24	60	11	5.5	3	GT5
1/4 - 20	62	13	6	3	GT7
5/16 - 18	70	14	6.1	3	GT7
W 3/8 - 16	75	16	7	3	GT8
7/16 - 14	80	18	8	3	GT8
1/2 - 12	85	21	9	3	GT8
9/16 - 12	90	21	10.5	3	GT8
5/8 - 11	95	23	12	3	GT9

英制牙 W Imperial Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
W 3/4 - 10	105	25	14	3	GT9
7/8 - 9	115	28	17	4	GT9
1 - 8	125	32	20	4	GT9
1-1/8 - 7	135	36	22	4	GT9
1-1/4 - 7	145	36	24	4	GT9

螺旋絲攻系列

S系列先端絲攻SGN

TAP SERIES

S Series Spiral Point Taps SGN

SUS



TAP-512

公制牙 M Metric Thread	全長 L mm	螺紋長 ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
※M 2 x 0.4	40	8	3	2	GT3
※ 2.3 x 0.4	42	9.5	3	2	GT3
※ 2.5 x 0.45	44	9.5	3	2	GT3
※ 2.6 x 0.45	44	9.5	3	2	GT3
※ 3 x 0.6	46	11	4	3	GT5
※M 3 x 0.5	46	11	4	3	GT5
※ 4 x 0.75	52	13	5	3	GT5
※ 4 x 0.7	52	13	5	3	GT5
4 x 0.5	52	13	5	3	GT5
※ 5 x 0.9	60	16	5.5	3	GT6
※M 5 x 0.8	60	16	5.5	3	GT6
5 x 0.5	60	16	5.5	3	GT5
※ 6 x 1	62	19	6	3	GT6
6 x 0.75	62	19	6	3	GT5
※ 7 x 1	65	19	6.2	3	GT6
※M 8 x 1.25	70	22	6.2	3	GT6
8 x 1	70	22	6.2	3	GT6
※ 9 x 1.25	72	22	7	3	GT6
※M 10 x 1.5	75	24	7	3	GT7
10 x 1.25	75	24	7	3	GT6
10 x 1	75	24	7	3	GT6
11 x 1.5	80	25	8	3	GT8
11 x 1.25	80	25	8	3	GT6
11 x 1	80	25	8	3	GT6

公制牙 M Metric Thread	全長 L mm	螺紋長 ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
※M 12 x 1.75	82	29	8.5	3	GT8
12 x 1.5	82	29	8.5	3	GT7
12 x 1.25	82	29	8.5	3	GT8
12 x 1	82	29	8.5	3	GT7
※ 14 x 2	88	30	10.5	3	GT8
M 14 x 1.5	88	30	10.5	3	GT7
14 x 1.25	88	30	10.5	3	GT7
14 x 1	88	30	10.5	4	GT7
※ 16 x 2	95	32	12.5	3	GT8
16 x 1.5	95	32	12.5	3	GT7
M 16 x 1	95	32	12.5	4	GT7
※ 18 x 2.5	100	37	14	3	GT9
18 x 2	100	37	14	3	GT8
18 x 1.5	100	37	14	3	GT8
18 x 1	100	37	14	4	GT7
※M 20 x 2.5	105	37	15	3	GT9
20 x 2	105	37	15	3	GT8
20 x 1.5	105	37	15	3	GT8
20 x 1	105	37	15	4	GT7
※ 22 x 2.5	115	38	17	3	GT9
M 22 x 2	115	38	17	4	GT8
22 x 1.5	115	38	17	4	GT8
※ 24 x 3	120	45	19	3	GT9
24 x 1.5	120	45	19	4	GT8

註：打※號則表示為粗牙規格

Note: Items marked with※are coarse threads.

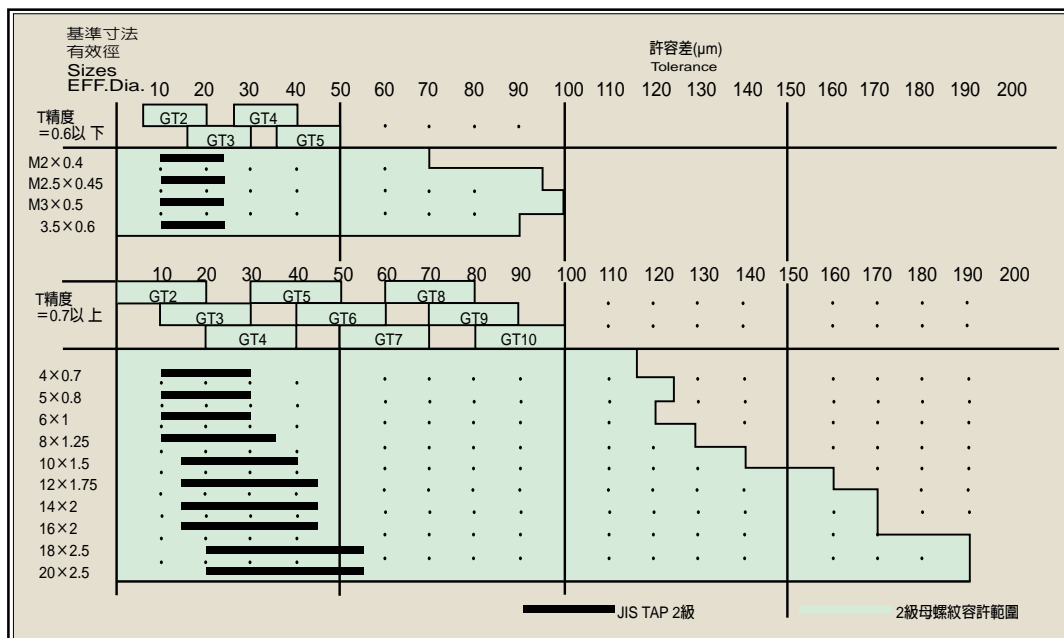
關於GT精度

GT精度與ANSI的GH精度一樣，採取階段式的設定，依據TAP的各種用途所選擇最適合的精度

(GT精度和母螺紋有效徑公差及 JIS TAP 2級公差的關係)

GT ACCURACY

The GT accuracy is set by various ranges, which is similar to ANSI and GH standards in accuracy setting. Taps accuracy is set by their applications. (Relationship among GT accuracy, female thread tolerance and JIS class 2 tolerance of taps)





TAP-512



美制粗牙 UNC U.S. Coarse Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
No. 2 - 56 UNC	42	9	3	2	GT3
No. 3 - 48	44	9	3	2	GT3
No. 4 - 40	44	11	3	2	GT5
No. 5 - 40	46	11	4	3	GT5
No. 6 - 32 UNC	48	13	4	3	GT5
No. 8 - 32	52	13	5	3	GT5
No. 10 - 24	60	16	5.5	3	GT6
No. 12 - 24	60	17	5.5	3	GT6
1/4 - 20	62	19	6	3	GT7
5/16 - 18	70	22	6.1	3	GT7
3/8 - 16 UNC	75	24	7	3	GT8
7/16 - 14	80	25	8	3	GT8
1/2 - 13	85	29	9	3	GT8
9/16 - 12	90	30	10.5	3	GT8
5/8 - 11	95	32	12	3	GT9
3/4 - 10 UNC	105	37	14	3	GT9
7/8 - 9	115	38	17	3	GT9
1 - 8	125	45	20	3	GT9

美制細牙 UNF U.S. Fine Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
No. 2 - 64 UNF	42	9	3	2	GT3
No. 3 - 56	44	9	3	2	GT3
No. 4 - 48	44	11	3	2	GT5
No. 5 - 44	46	11	4	3	GT5
No. 6 - 40	48	13	4	3	GT5
No. 8 - 36 UNF	52	13	5	3	GT5
No. 10 - 32	60	16	5.5	3	GT5
No. 12 - 28	60	17	5.5	3	GT6
1/4 - 28	62	19	6	3	GT6
5/16 - 24	70	22	6.1	3	GT7
3/8 - 24 UNF	75	24	7	3	GT7
7/16 - 20	80	25	8	3	GT8
1/2 - 20	85	29	9	3	GT8
9/16 - 18	90	30	10.5	3	GT8
5/8 - 18	95	32	12	3	GT8
3/4 - 16 UNF	105	37	14	3	GT8
7/8 - 14	115	38	17	4	GT9
1 - 12	125	45	20	4	GT9

英制牙 W Imperial Thread	全長 L mm	螺紋長ℓ mm	柄徑 d mm	溝數 Flutes	精度 番號 Limit
W 1/8 - 40	46	11	4	3	GT5
5/32 - 32	52	13	5	3	GT5
3/16 - 24	60	16	5.5	3	GT6
1/4 - 20	62	19	6	3	GT7
5/16 - 18	70	22	6.1	3	GT7
W 3/8 - 16	75	24	7	3	GT8
7/16 - 14	80	25	8	3	GT8
1/2 - 12	85	29	9	3	GT8
9/16 - 12	90	30	10.5	3	GT8
5/8 - 11	95	32	12	3	GT9
3/4 - 10	105	37	14	3	GT9
7/8 - 9	115	38	17	4	GT9
1 - 8	125	45	20	4	GT9

S 系列先端、螺旋絲攻

為您解決攻牙中，所有高精度、高效率需求的問題。
減輕成本，創造豐富的利潤。

S SERIES SPIRAL POINT TAPS

This series of taps is designed to meet your requirement for high accuracy and high efficiency. It reduces your production cost and creates more profits.

1. 卓越的切削性能和順暢切屑的處理

採用最理想的溝形，使切削屑變的細小而捲曲，最適切的螺旋角，使切削屑能暢順的排出，因此當螺紋加工完成的同時，切屑也同時順利地從TAP離開。

2. 防止母螺紋的擴大和穩定的精度

S系列的絲攻為切削加工與轉造加工二者兼具的獨特絲攻。因為從最初完全牙的切刃，皆附有無溝絲攻的螺紋離隙(TAFLET RELIEF)，因此能調整絲攻推進的力量，縱使被切削材是軟鋼，也不會產生母螺紋的擴大。(不通過螺紋栓牙規IP11，1牙以下即不能通過)。

3. 能加工出漂亮的螺紋面

因母螺紋切削後，再經過無溝絲攻的螺紋離隙加工的關係，比只有切削的作用，更能順利而漂亮地完成加工。

4. 絲攻的材質採用含有耐久性能的高級高速鋼材

針對被切削材，採取最適度的熱處理和表面處理。

1. OUTSTANDING CUTTING PERFORMANCE SMOOTH CHIPS EXHAUST

The excellent flute design produces fine and curled chips. The correct helical angle provides smooth chips exhaust. When thread tapping is finished, chips smoothly exhaust out from TAP.

2. AVOIDS FEMALE THREAD ENLARGE AND CONSTANT ACCURACY

The S series is special taps that combine tapping and transfer cutting functions in one. The cutting edges for initial full thread cutting edge feature TAFLET RELIEF with non-flute tap; therefore, the TAP feed force is adjustable. This fully eliminate female thread enlarge problem even tapping soft steel. (It does not go through IP11 thread gauge even for one more thread.)

3. CREATES BEAUTIFUL THREAD FLANKS

Once the female threads are cut, then TAFLET RELIEF machining is applied by non-flute tap. This provides more smooth and beautiful thread flanks than that of only cutting motion.

4. TAPS MANUFACTURED FROM DURABLE HIGH SPEED STEEL

Taps are properly heat treated and surface treated according to workpiece material.

S螺旋攻系列

TAP = 切削 + 塑性加工的母螺紋造型法

S TAP Series

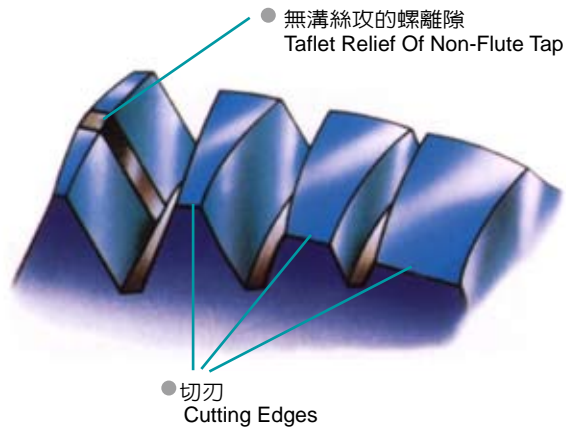
Tap=Cutting+Female Thread Produced By Soft Machining

防止母螺紋的擴大(二刀流的技術)

S系列的TAP是切削刀和滑行移動刀二者兼具的TAP，因為從最初完全牙的切刀，皆設計有無溝絲攻的螺紋離隙(TAFLET RELIEF)，因此TAP推進的力量可以調整，被切削材是軟鋼的話，母螺旋的擴大也可避免，(不通過螺紋栓牙規IP II，1牙以上即不能通過)。

AVOIDS FEMALE THREAD ENLARGE (DOUBLE CUTTING TECHNOLOGY)

The S series is special TAPS that combine cutting edge and moving edge. The initial full thread cutting edge features TAFLET RELIEF with non-flute TAP. Therefore, the TAP feed force is adjustable. This fully eliminates femal thread enlarging problem even tapping soft steel. (It does not go through IP II thread gauge even for one more thread)



卓越的切削屑排出性能

採用最理想的溝形，使切削屑能變得細小而捲曲，而最適切的螺旋角，使切削屑能安定的排出，因此當螺紋加工完成的同時，切削屑同時也順利的從TAP離開。

OUTSTANDING CHIPS EXHAUST

The excellent flute design produces fine and curled chips. The correct helical angle provides smooth chips exhaust. When thread tapping is finished, chips smoothly exhaust out from TAP.

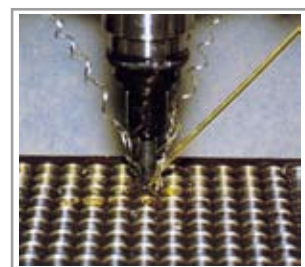


螺紋長度縮短解決切削屑堵塞的困擾

TAP 的螺紋長度設計比以往的還短，因此，螺紋崩裂和切削屑卡住的原因減少，所以切削屑更能迅速的排出。

REDUCED THREAD LENGTH ELIMINATES CHIPS JAMMING PROBLEM

The thread lengths are shorter than they of original design. This greatly reduces the possibility of thread breakage or chips jamming, while providing fast exhaust of chips.



細小的捲曲的

切削屑，如牽牛花般漂亮的排出。

The fine and curled chips are smoothly exhausted like morning glory.



能加工出漂亮的螺紋面(FLANK)

因為母螺紋是切削後再經過無溝絲攻的螺離隙(TAFLET RELIEF)滑行移動(轉造)加工，所以比只有單單切削式的加工，能更順利的，漂亮的完成螺面。

CREATES BEAUTIFUL THREAD FLANKS

Once the female threads are cut, then TAFLET RELIEF machining is applied by non-flute tap. This provides more smooth and beautiful thread flanks than that of only cutting motion.



No melting and complete oxidation treated.

以往的

切削屑附捲在TAP，容易引起切削屑的堵塞。

With previous design, chips may attach on the TAP, which may cause chip jamming problem.

S系列的

細小的、捲曲的切削屑，如牽牛花般漂亮的排出。

The chips generated on s series are fine and curled shapes. They exhaust out from tap like morning glory.

擠壓絲攻螺紋下孔徑表

RECOMMENDED DRILL HOLE SIZES FOR FORMING TAPS

公制螺紋

Metric Thread

規格 Size	1 級螺紋用下孔徑 JIS class 1 drill hole dia		2 級螺紋用下孔徑 JIS class 2 drill hole dia	
	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)
M 1.0 × 0.25	2	0.87 ~ 0.89 (100~85)	4	0.90 ~ 0.92 (100~80)
M 1.1 × 0.25	2	0.97 ~ 0.99 (100~85)	4	1.00 ~ 1.02 (100~80)
M 1.2 × 0.25	2	1.07 ~ 1.09 (100~85)	4	1.10 ~ 1.12 (100~80)
M 1.4 × 0.3	2	1.244 ~ 1.263 (100~85)	4	1.270 ~ 1.294 (100~80)
M 1.7 × 0.35	2	1.51 ~ 1.54 (100~80)	4	1.54 ~ 1.58 (100~75)
M 2.0 × 0.4	2	1.78 ~ 1.82 (100~80)	4	1.81 ~ 1.85 (100~75)
M 2.3 × 0.4	2	2.08 ~ 2.12 (100~80)	4	2.11 ~ 2.15 (100~75)
M 2.5 × 0.45	2	2.25 ~ 2.29 (100~80)	4	2.28 ~ 2.33 (100~75)
M 2.6 × 0.45	2	2.35 ~ 2.39 (100~80)	4	2.38 ~ 2.43 (100~75)
M 3.0 × 0.5	3	2.74 ~ 2.78 (100~80)	5	2.76 ~ 2.81 (100~75)
M 3.5 × 0.6	3	3.18 ~ 3.21 (100~85)	5	3.20 ~ 3.26 (100~75)
M 4.0 × 0.7	4	3.63 ~ 3.67 (100~85)	6	3.65 ~ 3.70 (100~85)
M 5.0 × 0.8	4	4.57 ~ 4.62 (100~85)	6	4.59 ~ 4.66 (100~80)
M 6.0 × 1.0	4	5.45 ~ 5.51 (100~85)	7	5.48 ~ 5.57 (100~80)
M 7.0 × 1.0	4	6.45 ~ 6.51 (100~85)	7	6.48 ~ 6.57 (100~80)
M 8.0 × 1.25	5	7.31 ~ 7.38 (100~85)	7	7.34 ~ 7.41 (100~85)
M 8.0 × 1.0	4	7.45 ~ 7.51 (100~85)	7	7.48 ~ 7.57 (100~80)
M 10.0 × 1.5	5	9.16 ~ 9.22 (100~90)	7	9.18 ~ 9.28 (100~85)
M 10.0 × 1.25	5	9.31 ~ 9.38 (100~85)	7	9.34 ~ 9.41 (100~85)
M 10.0 × 1.0	5	9.46 ~ 9.52 (100~85)	7	9.48 ~ 9.57 (100~80)
M 12.0 × 1.75	5	11.01 ~ 11.08 (100~90)	8	11.05 ~ 11.15 (100~85)
M 12.0 × 1.5	5	11.16 ~ 11.22 (100~90)	7	11.18 ~ 11.28 (100~85)
M 12.0 × 1.25	5	11.31 ~ 11.38 (100~85)	7	11.34 ~ 11.41 (100~85)
M 12.0 × 1.0	5	11.46 ~ 11.52 (100~85)	7	11.48 ~ 11.57 (100~80)
M 14.0 × 2.0	6	12.83 ~ 12.95 (100~90)	10	12.92 ~ 13.04 (100~85)
M 14.0 × 1.5	5	13.16 ~ 13.22 (100~90)	9	13.21 ~ 13.30 (100~85)
M 16.0 × 2.0	6	14.87 ~ 14.95 (100~90)	10	14.92 ~ 15.04 (100~85)
M 16.0 × 1.5	5	15.16 ~ 15.22 (100~90)	9	15.21 ~ 15.30 (100~80)
M 18.0 × 2.5	6	16.57 ~ 16.67 (100~90)	11	16.63 ~ 16.78 (100~85)
M 18.0 × 1.5	6	17.17 ~ 17.23 (100~90)	10	17.22 ~ 17.31 (100~85)
M 20.0 × 2.5	6	18.57 ~ 18.67 (100~90)	11	18.63 ~ 18.78 (100~85)
M 20.0 × 1.5	6	19.17 ~ 19.23 (100~90)	10	19.22 ~ 19.31 (100~85)

擠壓絲攻螺紋下孔徑表

RECOMMENDED DRILL HOLE SIZES FOR FORMING TAPS

美制粗牙螺紋

U.S. Coarse Thread

規格 Size	2B 級螺紋用下孔徑 JIS 2B class drill hole dia		3B 級螺紋用下孔徑 JIS 3B class drill hole dia	
	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)
NO. 2 - 56 UNC	4	1.96 ~ 2.02 (100~65)	3	1.95 ~ 2.01 (100~65)
NO. 3 - 48 UNC	4	2.25 ~ 2.32 (100~65)	3	2.23 ~ 2.31 (100~65)
NO. 4 - 40 UNC	5	2.52 ~ 2.60 (100~70)	3	2.50 ~ 2.58 (100~70)
NO. 5 - 40 UNC	5	2.86 ~ 2.93 (100~70)	3	2.83 ~ 2.91 (100~70)
NO. 6 - 32 UNC	5	3.09 ~ 3.17 (100~75)	3	3.06 ~ 3.14 (100~75)
NO. 8 - 32 UNC	6	3.75 ~ 3.83 (100~75)	4	3.74 ~ 3.82 (100~75)
NO. 10 - 24 UNC	6	4.26 ~ 4.35 (100~80)	4	4.24 ~ 4.32 (100~80)
NO. 12 - 24 UNC	6	4.92 ~ 5.01 (100~80)	4	4.90 ~ 4.96 (100~85)
1/4 - 20 UNC	6	5.66 ~ 5.76 (100~80)	4	5.64 ~ 5.74 (100~80)
5/16 - 18 UNC	7	7.18 ~ 7.29 (100~80)	5	7.15 ~ 7.24 (100~85)
3/8 - 16 UNC	7	8.66 ~ 8.78 (100~80)	5	8.63 ~ 8.73 (100~85)
7/16 - 14 UNC	7	10.11 ~ 10.25 (100~80)	5	10.08 ~ 10.19 (100~85)
1/2 - 13 UNC	8	10.62 ~ 11.78 (100~80)	6	11.60 ~ 11.68 (100~90)
9/16 - 12 UNC	10	13.14 ~ 13.27 (100~85)	8	13.11 ~ 13.24 (100~85)
5/8 - 11 UNC	11	14.62 ~ 14.76 (100~85)	8	14.58 ~ 14.67 (100~90)
3/4 - 10 UNC	12	17.67 ~ 17.88 (100~80)	9	17.63 ~ 17.74 (100~90)
7/8 - 9 UNC	12	20.68 ~ 20.85 (100~85)	9	20.64 ~ 20.75 (100~90)
1 - 8 UNC	13	23.65 ~ 23.84 (100~85)	10	23.61 ~ 23.74 (100~90)

美制細牙螺紋

U.S. Fine Thread

規格 Size	2B 級螺紋用下孔徑 JIS 2B class drill hole dia		3B 級螺紋用下孔徑 JIS 3B class drill hole dia	
	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)	SR精度 SR limits	最小 ~ 最大 (咬合率%) Min~max (thread overlap%)
NO. 2 - 64 UNF	3	1.98~2.04 (100~65)	2	1.97~2.03 (100~65)
NO. 3 - 56 UNF	4	2.29~2.35 (100~65)	3	2.28~2.34 (100~65)
NO. 4 - 48 UNF	4	2.57~2.64 (100~70)	3	2.56~2.63 (100~70)
NO. 5 - 44 UNF	4	2.88~2.95 (100~70)	3	2.87~2.94 (100~70)
NO. 6 - 40 UNF	5	3.19~3.26 (100~70)	3	3.16~3.22 (100~75)
NO. 8 - 36 UNF	5	3.80~3.88 (100~75)	4	3.79~3.86 (100~75)
NO. 10 - 32 UNF	5	4.41~4.48 (100~80)	4	4.40~4.46 (100~80)
NO. 12 - 28 UNF	5	5.00~5.08 (100~80)	4	4.99~5.06 (100~80)
1/4 - 28 UNF	5	5.86~5.93 (100~80)	4	5.85~5.92 (100~80)
5/16 - 24 UNF	6	7.38~7.46 (100~80)	5	7.36~7.43 (100~85)
3/8 - 24 UNF	6	8.96~9.05 (100~80)	5	8.95~9.02 (100~85)
7/16 - 20 UNF	7	10.44~10.54 (100~80)	5	10.41~10.49 (100~85)
1/2 - 20 UNF	7	12.02~12.12 (100~80)	5	12.00~12.05 (100~90)
9/16 - 18 UNF	9	13.55~13.66 (100~80)	7	13.53~13.58 (100~90)
5/8 - 18 UNF	9	15.14~15.25 (100~80)	7	15.11~15.17 (100~90)
3/4 - 16 UNF	10	18.22~18.32 (100~85)	7	18.18~18.25 (100~90)
7/8 - 14 UNF	11	21.27~21.38 (100~85)	8	21.23~21.27 (100~95)
1 - 12 UNF	12	24.28~24.41 (100~85)	9	24.24~24.32 (100~90)

螺絲攻下孔徑寸法表

Tap Drill Hole Sizes

公制牙細牙

Metric Fine Threads

規 格 Nominal Size	最小寸法 Min. Sizes		最大寸法 Max. Sizes	
	2級、3級 Class 2、Class 3		2 級 Class 2	3 級 Class 3
	M 26 x 2	23.63	24.08	24.08
M 26 x 1.5	24.38	24.68	24.75	
M 26 x 1	24.81	24.03	25.03	
M 26 x 0.5	25.40	25.52	--	
M 27 x 2	24.84	25.21	25.31	
M 27 x 1.5	25.38	25.68	27.75	
M 27 x 1	25.92	26.15	26.22	
M 28 x 2	25.84	26.21	26.31	
M 28 x 1.5	26.38	26.68	26.75	
M 28 x 1	26.92	27.15	27.22	
M 28 x 0.5	27.40	27.52	--	
M 30 x 3	26.75	27.25	27.38	
M 30 x 2	27.84	28.21	28.31	
M 30 x 1.5	28.38	28.68	28.75	
M 30 x 1	28.92	29.15	29.22	
M 30 x 0.5	29.40	29.52	--	
M 32 x 2	29.84	30.21	30.31	
M 32 x 1.5	30.38	30.68	30.75	
M 32 x 1	30.81	31.03	31.03	
M 32 x 0.5	31.40	31.52	--	
M 33 x 3	29.75	30.25	30.38	
M 33 x 2	30.84	31.21	31.31	
M 33 x 1.5	31.38	31.68	31.75	
M 34 x 2	31.62	32.08	32.08	
M 34 x 1.5	32.21	32.60	32.60	
M 34 x 1	32.81	33.03	33.03	
M 34 x 0.5	33.40	33.52	--	
M 35 x 1.5	33.38	33.68	33.75	
M 36 x 3	32.75	33.25	33.38	
M 36 x 2	33.84	34.21	34.31	
M 36 x 1.5	34.38	34.68	34.75	
M 36 x 1	34.81	35.03	35.03	
M 36 x 0.5	35.40	35.52	--	
M 38 x 2	35.62	36.08	36.08	
M 38 x 1.5	36.38	36.68	36.75	
M 38 x 1	36.81	37.03	37.03	
M 38 x 0.5	37.40	37.52	--	
M 39 x 3	35.75	36.25	36.38	
M 39 x 2	36.84	37.21	37.31	
M 39 x 1.5	37.38	37.68	37.75	
M 40 x 3	36.75	37.25	37.38	
M 40 x 2	37.84	38.21	38.31	
M 40 x 1.5	38.38	38.68	38.75	
M 40 x 1	38.81	39.03	39.03	
M 42 x 4	37.67	38.27	38.42	
M 42 x 3	38.75	39.25	39.38	
M 42 x 2	39.84	40.21	40.31	
M 42 x 1.5	40.38	40.68	40.75	
M 42 x 1	40.81	41.03	41.03	
M 45 x 4	40.67	41.27	41.42	
M 45 x 3	41.75	42.25	42.38	
M 45 x 2	42.84	43.21	43.31	
M 45 x 1.5	73.38	43.68	43.75	
M 45 x 1	43.81	44.03	44.03	
M 48 x 4	43.67	44.27	44.42	
M 48 x 3	44.75	45.25	45.38	
M 48 x 2	45.84	46.21	46.31	
M 48 x 1.5	46.38	46.68	46.75	
M 48 x 1	46.81	47.03	47.03	
M 50 x 3	46.75	47.25	47.38	
M 50 x 2	47.84	48.21	48.31	
M 50 x 1.5	48.38	48.68	48.75	
M 50 x 1	48.81	49.03	49.03	

美制牙

U.S. Threads

規 格 Nominal Size	最小寸法 Min. Sizes		最大寸法 Max. Sizes	
	2B	1B	2B	1B
	NO. 1 - 64 UNC	1.43		1.58
NO. 2 - 56 UNC	1.69		1.87	
NO. 3 - 48 UNC	1.94		2.15	
NO. 4 - 40 UNC	2.16		2.39	
NO. 5 - 40 UNC	2.49		2.70	
NO. 6 - 32 UNC	2.64		2.90	
NO. 8 - 32 UNC	3.30		3.53	
NO. 10 - 24 UNC	3.68		3.96	
NO. 12 - 24 UNC	4.34		4.60	
1/4 - 20 UNC	4.98		5.26	
5/16 - 18 UNC	6.40		6.73	
3/8 - 16 UNC	7.80		8.15	
7/16 - 14 UNC	9.14		9.55	
1/2 - 13 UNC	10.59		11.02	
9/16 - 12 UNC	11.99		12.45	
5/8 - 11 UNC	13.39		13.87	
3/4 - 10 UNC	16.31		16.84	
7/8 - 9 UNC	19.18		19.76	
1 - 8 UNC	21.97		22.61	
1-1/8 - 7 UNC	24.64		25.35	
1-1/4 - 7 UNC	27.81		28.52	
1-3/8 - 6 UNC	30.35		31.12	
1-1/2 - 6 UNC	33.53		34.29	
1-3/4 - 5 UNC	38.96		39.83	
2 - 4-1/2 UNC	44.68		45.59	
NO. 0 - 80 UNF	1.18		1.31	
NO. 1 - 72 UNF	1.47		1.61	
NO. 2 - 64 UNF	1.76		1.91	
NO. 3 - 56 UNF	2.02		2.20	
NO. 4 - 48 UNF	2.27		2.46	
NO. 5 - 44 UNF	2.55		2.74	
NO. 6 - 40 UNF	2.82		3.02	
NO. 8 - 36 UNF	3.40		3.61	
NO. 10 - 32 UNF	3.96		4.17	
NO. 12 - 28 UNF	4.50		4.72	
1/4 - 28 UNF	5.36		5.59	
5/16 - 24 UNF	6.78		7.04	
3/8 - 24 UNF	8.38		8.64	
7/16 - 20 UNF	9.73		10.03	
1/2 - 20 UNF	11.33		11.61	
9/16 - 18 UNF	12.75		13.08	
5/8 - 18 UNF	14.35		14.68	
3/4 - 16 UNF	17.32		17.68	
7/8 - 14 UNF	20.27		20.67	
1 - 12 UNF	23.11		23.57	
1-1/8 - 12 UNF	26.29		26.75	
1-1/4 - 12 UNF	29.46		29.92	
1-3/8 - 12 UNF	32.64		33.10	
1-1/2 - 12 UNF	35.81		36.27	
規 格 Nominal Size	最小寸法 Min. Sizes		最大寸法 Max. Sizes	
	A 列 A Series		B 列 B Series	
W 1/4 - 20	5.1		5.0	
W 5/16 - 18	6.6		6.5	
W 3/8 - 16	8.0		7.9	
W 7/16 - 14	9.4		9.3	
W 1/2 - 12	10.7		10.5	
W 9/16 - 12	12.3		12.0	
W 5/8 - 11	13.7		13.5	
W 3/4 - 10	16.7		16.5	
W 7/8 - 9	19.5		19.3	
W 1 - 8	22.4		22.0	
W 1-1/8 - 7	25.0		24.8	
W 1-1/4 - 7	28.3		28.0	
W 1-3/8 - 6	30.5		30.3	
W 1-1/2 - 6	33.8		33.5	
W 1-5/8 - 5	36.0		35.7	
W 1-3/4 - 5	39.2		39.0	
W 1-7/8 - 4-1/2	41.8		41.5	
W 2 - 4-1/2	45.0		44.7	

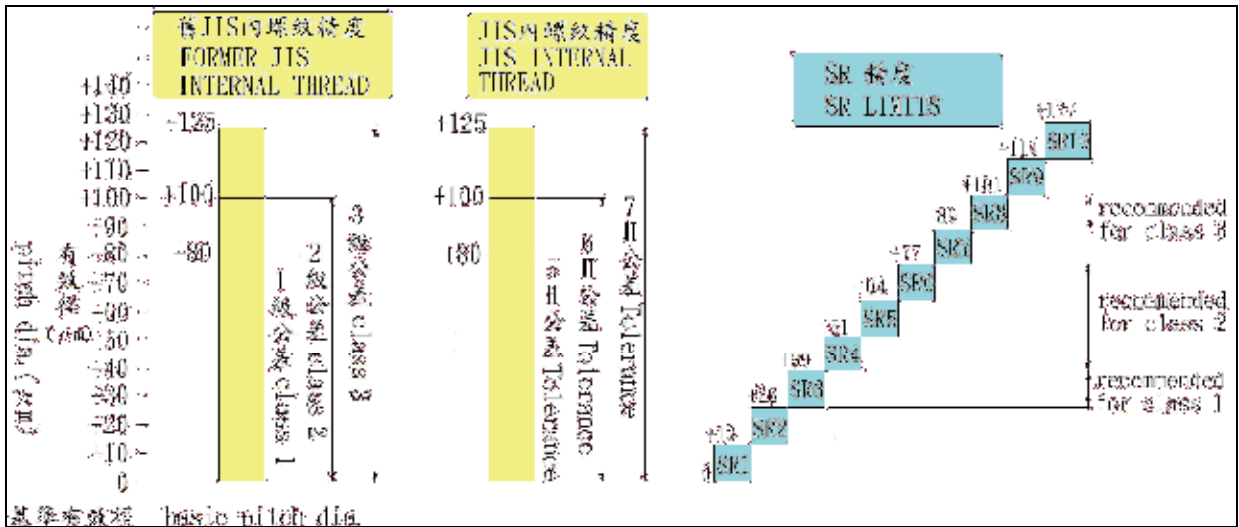
SR精度表

SR LIMITS

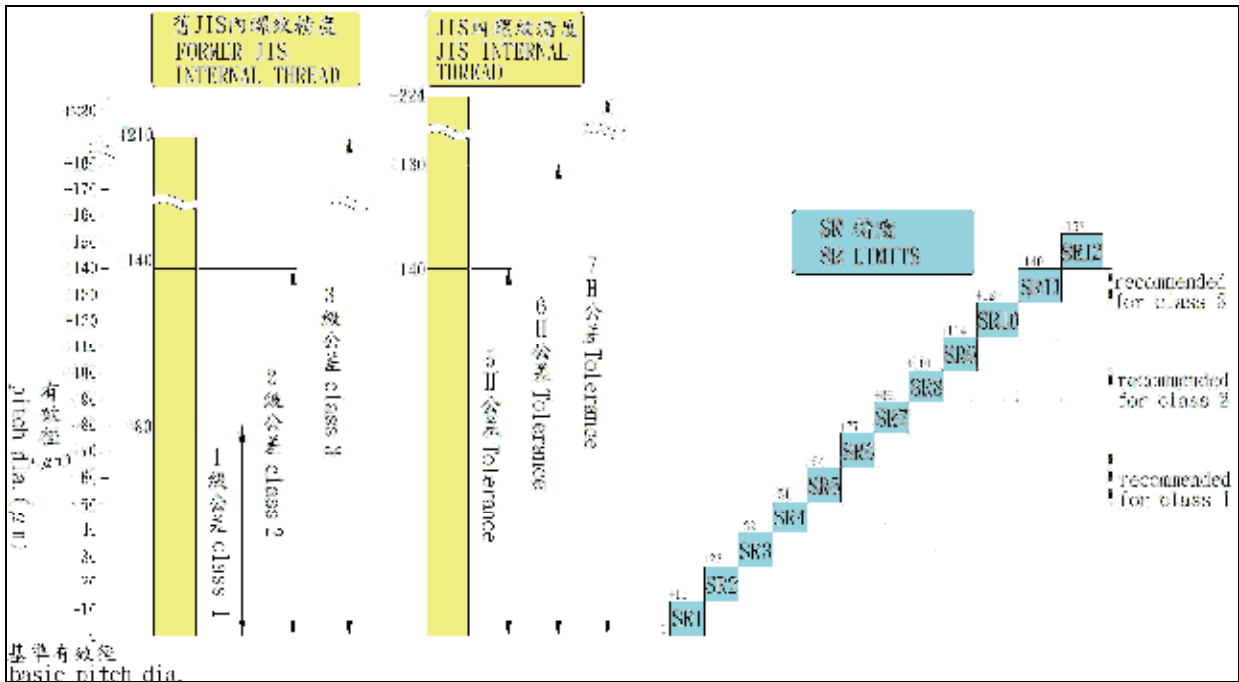
絲攻系列 TAPS Series

上限值 : $0.0127 \times n$ Upper limit : $0.0127 \times n$
 下限值 : 上限值 - 0.0127 Lower limit : upper limit - 0.0127
 單位 : mm (n=SR 番號) Unit : mm (n=SR number)

$P \leq 0.6$ 例 : M3X0.5 Example : M3X0.5



$P \geq 0.7$ 例 : M10X1.5 Example : M10X1.5



切削速度與切削液

RECOMMENDED TAPPING SPEEDS & LUBRICANTS

1. 攻牙速度主要之考量點為螺絲攻材料、種類、吃入部長度、下孔之形狀，被攻牙材料及切削油等使用之條件，而適當選擇下表之速度。
 2. 大致上被加工材之切削性良好，攻牙長度較短及切削油充分使用之場合，其攻牙速度可以設在較高之速度，反之被削性不好或不明瞭等條件時，則攻牙速度可設在下限處，然後再視情況增加較安全。
1. Following usage chart the recommended tapping speeds and cutting fluids, tap material type of tap chamfer length dimension of drill hole work material and cutting fluids are important factors for determining suitable tapping speed.
 2. When work material has excellent workability, when there is a little depth of tapping, or when tapping fluid can be sufficient, select rather high tapping speed. When workability of work material is unknown, it is safe to try nearly the lowest tapping speed at first, and then increase the speed gradually.

加工材料 Work Material		切削速度 (M / MIN) Cutting Speed				切削液 Lubricants			
		螺旋絲攻 Spiral Flute Tap	先端絲攻 Spiral Point Tap	鎢鋼絲攻 Solid Carbide Tap	擠壓絲攻 Forming Tap	油性 (乳化液) Emulsion	水溶性 Water Soluble	半乾式 Semi-dry	乾式 Dry
低碳素鋼 Low Carbon Steels	C 0.25%以下	8 ~ 13	15 ~ 25	—	8 ~ 13	◎	○	△	△
中碳素鋼 Mild Carbon Steels	C 0.25~0.45%	7 ~ 12	10 ~ 15	—	7 ~ 10	◎	○	△	△
高碳素鋼 High Carbon Steels	C 0.45%以上	6 ~ 9	8 ~ 13	—	5 ~ 8	◎	○	△	△
合金鋼 Alloy Steels	SCM	7 ~ 12	10 ~ 15	—	5 ~ 8	◎	△	△	△
調質鋼 Prehardened Steels	25~45HRC	3 ~ 5 (4 ~ 8)	4 ~ 6 (6 ~ 10)	—	—	◎	△	—	—
不銹鋼 Stainless Steels	SUS	5 ~ 8	8 ~ 13	—	5 ~ 10	◎	○	—	—
不銹鋼 Stainless Steels	SUS630.SUS63	3 ~ 5	4 ~ 6	—	—	◎	—	—	—
工具鋼 Tools Steels	SKD	6 ~ 9	7 ~ 10	—	—	◎	—	—	—
鑄鋼 Cast Steels	SC	6 ~ 11	10 ~ 15	—	—	◎	○	—	—
鑄鐵 Cast Iron	FC	—	—	10 ~ 20	—	◎	○	○	○
球鑄鐵 Ductile Cast Iron	FCD	7 ~ 12	10 ~ 20	10 ~ 20	—	◎	○	○	—
銅 Copper	Cu	6 ~ 11	7 ~ 12	10 ~ 20	7 ~ 12	○	○	—	—
黃銅・黃銅鑄件 Brass・Brass Cast	Bs・BsC	10 ~ 20	15 ~ 25	15 ~ 25	7 ~ 12	○	○	○	○
青銅・青銅鑄件 Phosphoric Bronze・ Phosphoric Bronze Cast	PB・PBC	6 ~ 11	10 ~ 20	10 ~ 20	7 ~ 12	○	○	—	—
變形 鋁合金 Deformed Aluminum	AL	10 ~ 20	10 ~ 25	—	10 ~ 20	◎	○	△	—
鋁合金 鑄件 Aluminum Alloy Cast	AC・ADC	10 ~ 15	15 ~ 20	10 ~ 20	10 ~ 15	◎	○	△	—
鎂合金 Magnesium Alloy	MC	7 ~ 12	10 ~ 15	10 ~ 20	—	◎	○	○	—
鋅鑄件 Zinc Cast	ZDC	7 ~ 12	10 ~ 15	10 ~ 20	7 ~ 12	◎	○	△	—
熱硬塑料	THERMO SETTING PLASTIC	—	—	15 ~ 25	—	—	○	○	○
熱可塑性塑料	THERMO PLASTIC	10 ~ 15	10 ~ 20	10 ~ 20	—	—	○	○	○

◎最適用 ○適用 △可使用 —不可使用

◎Most suitable ○Suitable △Usable —Non-usable

※ 切削條件計算公式

※ Drilling Calculation Formula

迴轉速 (N) Rotation Speed

$$N = \frac{1,000V}{\pi d} \text{ (min}^{-1}\text{)}$$

切削速度 (V) Cutting Speed

$$V = \frac{\pi d N}{1,000} \text{ (M/min)}$$

進刀速度 (F) Feed Speed

$$F = \frac{f \cdot Z \cdot N(D \pm d)}{D} \text{ (mm/min)}$$

註：母螺紋之場合(-)
公螺紋之場合(+)

D：加工徑(mm)

d：徑(mm)

Z：刃數

f：回轉的進刀量(mm)

V：切削速度(M/min)

N：迴轉速(min⁻¹)

π：圓周率(3.1415)

Female Thread (-)

Male Thread (+)

D：Maching Diameter(mm)

d：Diameter(mm)

Z：Cutting edge flutes

f：Feed amount of rotation(mm)

V：Cutting Speed(M/min)

N：Rotation Speed (min⁻¹)

π：Ratio of the circumference of a circle to the diameter (3.1415)

情 況 Problem	原 因 probable Causes	對 策 Correction
有效徑擴大 Effect Diameter enlarged	絲攻選擇不適當 Improper tap selection	(1) 使用適當精度之螺絲攻。 (2) 要配合加工材質，來選擇螺絲攻。 (1) Use proper limits of taps (2) Select tap to meet work piece material
	作業條件不適當 Improper working condition	(1) 防止螺絲攻與下孔中心之偏斜。 (2) 防止軸心晃動。 (3) 將絲攻或加工物改為浮動夾持。 (4) 使用正確之進給速度，防止螺紋變瘦。 (1) Prevent non-alignment between tap and hole center (2) Prevent spindle vibration (3) Use floating clamping for tap or work piece (4) Use correct feed speed to prevent slightness of thread
	熔 著 Melted	(1) 將絲攻施以氧化處理。 (2) 使用反熔著性高之切削油。 (3) 將下孔徑加大，母螺紋內徑不要碰觸到絲攻之牙底。 (4) 降低攻牙速度。 (1) Perform oxidation treatment on tap (2) Use anti-weld cutting oil (3) Increase tap drill hole diameter to prevent female thread from touching thread bottom of tap (4) Reduce tapping speed
內徑擴大 Inside diameter enlarged	下孔徑不正確 Incorrect hole size	(1) 將下孔徑減少至正確值。 (2) 防止有斜度之下孔徑。 (1) Reduce hole size to a correct value (2) Avoid tapered hole
	熔著 Melted	(1) 發生熔著時會擦刮母螺紋內徑，防止熔著。 (1) Melt may scratch inside diameter of female thread
有效徑縮小 Effect diameter reduced	絲攻選擇不適當 Improper tap selection	(1) 使用超大尺寸之螺絲攻（被削材為薄肉之情形）。 (1) Use big-size tap(For thin-wall work piece)
	母螺紋受損傷 Female thread damaged	(1) 逆轉時，螺絲攻退後之速度要正確，且不傷到螺孔口端。 (1) Tap returning speed must be correct and not to damage female thread
內徑縮小 Inside diameter reduced	下孔徑不正確 Incorrect hole size	(1) 下孔徑要加大至正確之值。 (2) 防止有斜度之下孔徑。 (1) Reduce hole size to correct value (2) Avoid tapered hole
加工面有撕裂紋 Tearing on machined surface	熔 著 Melted	(1) 將絲攻施以氧化處理。 (2) 改變切削油之種類及注油方法。 (3) 降低攻牙速度。 (4) 防止下孔徑過小。 (5) 防止下孔傾斜。 (1) Perform oxidation treatment on tap (2) Use different kinds of cutting oils and change lubrication methods (3) Reduce tapping speed (4) Avoid too small hole diameter (5) Avoid hole tilting

擠壓絲攻攻牙作業發生異常原因及對策

Trouble Shooting For Forming Taps Machining

情況 Problem	原因 probable Causes	對策 Correction
折斷 Breakage	攻牙扭矩過大 Excessive tapping torque	(1) 將下孔徑加大至正確之值。 (2) 使用潤滑性佳之切削油。 (3) 防止熔著。 (1) Increase hole diameter to a correct value (2) Use better lubrication performance of cutting oil (3) Avoid melting
	使用條件不適當 Improper working condition	(1) 降低攻牙速度。 (2) 防止絲攻軸心與下孔中心之偏離，防止下孔傾斜。 (3) 將絲攻改為浮動夾持。 (4) 調整扭矩限值。 (5) 防止絲攻碰撞下孔之底部。 (1) Reduce tapping speed (2) Prevent non-alignment between tap and hole center. Prevent hole tilting (3) Use floating clamping for tap (4) Adjust torque limit value (5) Prevent tap from touching hole bottom
刃口崩裂 Cutting edge breakage	絲攻選擇不適當 Improper tap selection	(1) 使用倒牙部為P型之螺絲攻。 (1) Use P type thread of tap
	使用條件不適當 Improper working condition	(1) 降低攻牙速度。 (2) 防止中心偏離，吃入時不要發生衝擊。 (3) 防止熔著。 (4) 儘可能加大下孔徑。 (1) Reduce tapping speed (2) Avoid center error and impact when tap is entering (3) Avoid melting (4) Increase hole diameter
磨耗 Wear out	絲攻選擇不適當 Improper tap selection	(1) 將絲攻施以氮化處理。 (2) 使用倒牙部為P型之螺絲攻。 (1) Perform oxidation treatment on tap (2) Use P type thread of tap
	使用條件不適當 Improper working condition	(1) 降低攻牙速度。 (2) 改變切削油之種類及注油方法。 (3) 防止下孔內壁之加工硬化。 (4) 儘可能加大下孔徑。 (1) Reduce tapping speed (2) Use different kinds of cutting oils and change lubrication methods (3) Prevent hole surface from hardening during machining (4) Increase hole diameter

情 況 Problem	原 因 probable Causes	對 策 Correction
折斷 Breakage	絲攻選擇不適當 Improper tap selection	(1)防止鐵屑堵塞。 (1) Avoid chips jamming
	切削扭力過大 Excessive cutting torque	(1) 下孔徑儘量擴大。 (2) 縮短攻牙長度。 (3) 改用細牙螺紋。 (4) 增加螺絲攻之銳利度加大切削角。 (5) 減少摩擦、扭力、螺紋部間隙角稍微加大、刃部厚度減小。 (6) 使用螺旋絲攻。 (1) Increase hole diameter (2) Reduce tap thread length (3) Use fine thread (4) Increase tap sharpness and cutting angle (5) Reduce friction and torque Slightly increase clearance angle on threaded part. Reduce cutting edge thickness (6) Use spiral flute taps
	使用條件不適當 Improper working condition	(1) 降低切削速度。 (2) 防止螺紋攻與下孔偏心或傾斜。 (3) 螺絲攻之夾持採用浮動式。 (4) 攻牙夾持器改用可調整式。 (5) 盲孔之下孔徑、防止螺絲攻碰到孔底。 (1) Reduce cutting speed (2) Prevent non-alignment or tilting between tap and hole center (3) Use floating clamping for tap (4) Use adjustable tap chuck (5) Prevent tap from touching hole bottom for the drill hole of blind hole
	再研磨不適當 Improper resharpening	(1) 不得研磨溝底。 (2) 避免刃厚過小。 (3) 耗損部應磨掉。 (4) 提早再研磨時間。 (1) Do not sharpen flute bottom (2) Avoid too small edge thickness (3) Grind off worn part (4) Perform resharpening earlier
崩刃 Cutting edge breakage	絲攻選擇不適當 Improper tap selection	(1) 減少切削角度。 (2) 更換螺絲攻材質。 (3) 降低硬度。 (4) 增加倒牙部的長度。 (5) 防止切屑堵塞。 (1) Reduce cutting angle (2) Use different material of tap (3) Reduce hardness (4) Increase chamfer length (5) Avoid chips jamming

切削絲攻攻牙作業發生異常原因及對策

Trouble Shooting For Cutting Taps Machining

情況 Problem	原因 probable Causes	對策 Correction
	使用條件不適當 Improper working condition	(1) 降低切削速度。 (2) 防止中心偏差，避免導入時衝擊。 (3) 盲孔時，不得急速回轉。 (4) 防止熔著。 (1) Reduce cutting speed (2) Avoid center error and impact when tap is entering (3) Do not fast return when tapping blind hole (4) Avoid melting
耗損 Wear out	絲攻選擇不適當 Improper tap selection	(1) 如加工物是硬質，應使用特殊設計的絲攻。 (2) 更換材質（含有鈮的材質）。 (3) 表面處理（氮化處理）。 (4) 增加倒牙部長度。 (1) Use specially designed taps as tapping hard work piece (2) Change material (material including Vanadium) (3) Surface treatment (Nitriding) (4) Increase length of thread
	使用條件不適當 Improper working condition	(1) 降低切削速度。 (2) 改換切削油種類及注油方式。 (3) 防止下孔加工硬化。 (1) Reduce cutting speed (2) Use different kinds of cutting oils and change lubrication methods (3) Prevent hole surface from hardening during machining
	再研磨不適當 Improper tap resharpener	(1) 切削角度勿過大。 (2) 防止再研磨過熱。 (1) Avoid too big cutting angle (2) Avoid over heat during resharpener
擴大 Hole enlarged	絲攻選擇不適當 Improper tap selection	(1) 使用精度級數適合的螺絲攻。 (2) 增加倒牙部的長度。 (1) Select correct limit grade of tap (2) Increase length of thread
	切屑堵塞 Chip jamming	(1) 擴大溝的容積。 (2) 使用細牙螺紋。 (3) 徑儘量加大。 (4) 盲孔的攻牙，下孔儘量加深。 (5) 縮短攻牙長度。 (6) 改用他種切削油及注油方式。 (1) Increase flute volume (2) Use fine thread of tap (3) Increase hole diameter (4) Increase depth of blind hole (5) Reduce tap thread (6) Use different kinds of cutting oils and change lubrication methods

情 況 Problem	原 因 probable Causes	對 策 Correction
	使用條件不適當 Improper working condition	(1) 調整切削速度。 (2) 防止螺絲攻與下孔偏心或傾斜。 (3) 螺絲攻或工作物之固定改用浮動式。 (4) 進刀速度應適當而防止牙山變形。 (5) 同步式進刀方式（螺距進刀方式）。 (6) 適當選用攻牙機的加工能力。 (7) 防止主軸振動。 (1) Adjust cutting speed (2) Prevent non-alignment or tilting between tap and hole center (3) Use floating clamping for tap or work piece (4) Use proper feed to avoid damage on threads (5) Synchronized (pitch feed) (6) Use correct capacity of tapping machine (7) Avoid spindle vibration
	熔著 Melted	(1) 使用經表面處理之螺絲攻。 (2) 改用反熔著性較高的切削油。 (3) 降低切削速度。 (4) 改變切削角使適合被削材質。 (1) Use surface treated tap (2) Use higher melting-resistance cutting oil (3) Reduce cutting speed (4) Change cutting angle to meet work piece material
	螺絲攻再研磨不適當 Improper tap resharpening	(1) 溝的分度應均一。 (2) 切削角及倒牙部間隙角勿過大。 (3) 刀刃背部勿過小。 (4) 去除研磨毛邊。 (1) Flutes spacing should be uniform (2) Cutting angle and thread clearance angle should not be too big (3) Cutting edge back should not be too small (4) Remove burrs
縮小 Reduced	絲攻選擇不適當 Improper tap selection	(1) 使用加大（OVER SIZE）螺絲攻。 a. 對被削材如屬銅合金、鋁合金、鑄鐵等攻牙時擴大率較少的。 b. 被削材如為管狀或薄板等容易反縮時。 (2) 倒牙間隙角要適當。 (3) 加大切削角。 (1) Use over size tap a. Applicable for less-enlargement materials. Such as copper alloy, aluminum alloy and cast iron b. Work piece such as tubular shape or thin plate is easy to shrink-back (2) Note for proper chamfer clearance angle (3) Increase cutting angle

切削絲攻攻牙作業發生異常原因及對策

Trouble Shooting For Cutting Taps Machining

情 況 Problem	原 因 probable Causes	對 策 Correction
	內螺紋損傷 Internal thread damaged	(1) 回轉退出時，尤其是絲攻將離開內螺紋紋口處，速度應適當以免有損傷發生。 (1) When retracting tap, use proper retracting speed to avoid damage, especially when tap just leaves form internal thread portion
	內螺紋中有切屑殘留 Chip existed in internal thread	(1) 磨利螺絲攻，減少其鬚狀切屑之留存。 (2) 完全清除切屑後，才以量規檢查。 (1) Properly sharpen tap to prevent burr chip existing (2) Remove chips completely then use a gauge to inspect
崩裂或咬痕 Breakage or cutting mark	倒牙長度不夠 Insufficient chamfer length	(1) 增加先端倒牙部長度。 (1) Increase chamfer length
	切削角不適當 Improper cutting angle	(1) 切削角須配合工作物材質。 (1) Cutting angle must meet work piece
	熔著 Melted	(1) 使用螺紋部有間隙角加工之螺絲攻。 (2) 減少刃部厚度。 (3) 使用經表面處理的螺絲攻。 (4) 改變切削油種類及注油方式。 (5) 降低切削速度。 (1) Use a proper tap with clearance angle on thread (2) Reduce cutting edge thickness (3) Use surface treated tap (4) Use different kinds of cutting oils and change lubrication methods (5) Reduce cutting speed
	切屑堵塞 Chip jamming	(1) 加大下孔徑。 (1) Increase hole diameter
振波 Vibrating wave	過分銳利 Too sharp	(1) 減少切削角度。 (1) Reduce cutting angle
	再研磨不適當 Improper tap resharping	(1) 避免刃部厚度過小。 (2) 不得研磨溝底。 (1) Avoid too small edge thickness (2) Do not grind flute bottom

硬度換算表

Hardness Conversion Table

絲攻系列 TAPS Series

抗張 強度 Tensile Strength	Vickers		Rockwell					Rockwell Superficial			Brinell
	HV	HRA	HRB	HRC	HRD	15N	30N	45N	HB		
N/ mm ²	50kgf	Diamond 60kgf	1/16Ball 100kgf	Diamond 150kgf	Diamond 100kgf	Diamond 15kgf	Diamond 30kgf	Diamond 45kgf	10mm/Ball 300kgf		
	940	85.6	—	68	76.9	93.2	84.4	75.4	—		
	920	85.3	—	67.5	76.5	93.0	84.0	74.3	—		
	900	85.0	—	67.0	76.1	92.9	83.6	74.0	—		
	880	84.7	—	66.4	75.7	92.7	83.1	73.6	—		
	860	84.4	—	65.9	75.3	92.5	82.7	73.1	—		
	840	84.1	—	65.3	74.8	92.3	82.2	72.2	—		
	820	83.8	—	64.7	74.3	92.1	81.7	71.8	—		
	800	83.4	—	64.0	73.8	91.8	81.1	71.0	—		
	780	83.0	—	63.3	73.3	91.5	80.4	70.2	—		
	760	82.6	—	62.5	72.6	91.2	79.7	69.4	—		
	740	82.2	—	61.8	72.1	91.0	79.1	68.6	—		
	720	81.8	—	61.0	71.5	90.7	78.4	67.7	—		
	700	81.3	—	60.1	70.8	90.3	77.6	66.7	—		
	690	81.1	—	59.7	70.5	90.1	77.2	66.2	—		
	680	80.8	—	59.2	70.1	89.8	76.8	65.7	—		
	670	80.6	—	58.8	69.8	89.7	76.4	65.3	—		
	660	80.3	—	58.3	69.4	89.5	75.9	64.7	—		
2180	650	80.0	—	57.8	69.0	89.2	75.5	64.1	—		
2145	640	79.8	—	57.3	68.7	89.0	75.1	63.5	—		
2105	630	79.5	—	56.8	68.3	88.2	74.6	63.0	—		
2070	620	79.2	—	56.3	67.9	88.5	74.2	62.4	—		
2030	610	78.9	—	55.7	67.5	88.2	73.6	61.7	—		
1995	600	78.6	—	55.2	67.0	88.0	73.2	61.2	—		
1955	590	78.4	—	54.7	66.7	87.8	72.7	60.5	—		
1920	580	78.0	—	54.1	66.2	87.5	72.1	59.9	—		
1800	570	77.8	—	53.6	65.8	87.2	71.7	59.3	—		
1845	560	77.4	—	53.0	65.4	86.9	71.2	58.6	—		
1810	550	77.0	—	52.3	64.8	86.6	70.5	57.8	505		
1775	540	76.7	—	51.7	64.4	86.3	70.0	57.0	496		
1740	530	76.4	—	51.1	63.9	86.0	69.5	56.2	488		
1700	520	76.1	—	50.5	63.5	85.7	69.0	55.6	480		
1665	510	75.7	—	49.8	62.9	85.4	68.3	54.7	473		
1630	500	75.3	—	49.1	62.2	85.0	67.7	53.9	465		
1595	490	74.9	—	48.4	61.6	84.7	67.1	53.1	456		
1555	480	74.5	—	47.7	61.3	84.3	66.4	52.2	448		
1520	470	74.1	—	46.9	60.7	83.9	65.7	51.3	441		
1485	460	73.6	—	46.1	60.1	83.6	64.9	50.4	433		
1455	450	73.3	—	45.3	59.4	83.2	64.3	49.4	425		
1420	440	72.8	—	44.5	58.8	82.8	63.5	48.4	415		
1385	430	72.3	—	43.6	58.2	82.3	62.7	47.4	405		
1350	420	71.8	—	42.7	57.5	81.8	61.9	46.4	397		
1320	410	71.4	—	41.8	56.8	81.4	61.1	45.3	388		

- 本表適用於鋼鐵材料。
- 選用 V 槽測試盤時應注意鑽石針與 V 槽的中心位置。
- 圓形表面測試結果較平面測試為低，應加補正值。
- 補正值為該硬度機之試驗值。

抗張 強度 Tensile Strength	Vickers		Rockwell					Rockwell Superficial			Brinell
	HV	HRA	HRB	HRC	HRD	15N	30N	45N	HB		
N/ mm ²	50kgf	Diamond 60kgf	1/16Ball 100kgf	Diamond 150kgf	Diamond 100kgf	Diamond 15kgf	Diamond 30kgf	Diamond 45kgf	10mm/Ball 300kgf		
1290	400	70.8	—	40.8	56.0	81.0	60.2	44.1	379		
1255	390	70.3	—	39.8	55.2	80.3	59.3	42.9	369		
1220	380	69.8	110.0	38.8	54.4	79.8	58.4	41.7	360		
1190	370	69.2	—	37.7	53.6	79.2	57.4	40.4	350		
1155	360	68.7	109.0	36.6	52.8	78.6	56.4	39.1	341		
1125	350	68.1	—	35.5	51.9	78.0	55.4	37.8	331		
1095	340	67.6	108.0	34.4	51.1	77.4	54.4	36.5	322		
1060	330	67.0	—	33.3	50.2	76.8	53.6	35.2	313		
1030	320	66.4	107.0	32.2	49.4	76.2	52.3	33.9	303		
995	310	65.8	—	31.0	48.4	75.6	51.3	32.5	294		
965	300	65.2	105.0	29.8	47.5	74.9	50.2	31.1	284		
—	295	64.8	—	29.2	47.1	74.6	49.7	30.4	280		
930	290	64.5	104.5	28.5	46.5	74.2	49.0	29.5	275		
—	285	64.2	—	27.8	46.0	73.8	48.4	28.7	270		
900	280	63.8	103.5	27.1	45.3	73.4	47.8	27.9	265		
—	275	63.5	—	26.4	44.9	73.0	47.2	27.1	261		
865	270	63.1	102.0	25.6	44.3	72.6	46.4	26.2	256		
—	265	62.7	—	24.8	43.7	72.1	45.7	25.2	252		
835	260	62.4	101.0	24.0	43.1	71.6	45.0	24.3	247		
—	255	62.0	—	23.1	42.2	71.1	44.2	23.2	243		
800	250	61.6	99.5	22.2	41.7	70.6	43.4	22.2	238		
—	245	61.2	—	21.3	41.1	70.1	42.5	21.1	233		
770	240	60.7	98.1	20.3	40.3	69.6	41.7	19.9	228		
740	230	—	96.7	18.0	—	—	—	—	219		
705	220	—	95.0	15.7	—	—	—	—	209		
675	210	—	93.4	13.4	—	—	—	—	200		
640	200	—	91.5	11.0	—	—	—	—	190		
610	190	—	89.5	8.5	—	—	—	—	181		
575	180	—	87.1	6.0	—	—	—	—	171		
545	170	—	85.0	3.0	—	—	—	—	162		
510	160	—	81.7	0.0	—	—	—	—	152		
480	150	—	78.7	—	—	—	—	—	143		
450	140	—	75.0	—	—	—	—	—	133		
415	130	—	71.2	—	—	—	—	—	124		
—	120	—	66.7	—	—	—	—	—	114		
—	110	—	62.3	—	—	—	—	—	105		
—	100	—	56.2	—	—	—	—	—	95		

- This table is suitable for steel materials.
- When using v-slot tester, pay attention to diamond indent and V-slot center position.
- The test value for circular surface is lower than that of flat surface; therefore, a compensation value should be added.
- The compensation value is the test value of the hardness tester.

英制、公制對照表

Inch / Metric Conversion Table

吋 Inch		俚語 Slang	厘米 mm		
分數 mm	小數 Fraction			1"	2"
1/64	0.0156		0.3969	25.7969	51.1965
1/32	0.0312	2厘半	0.7937	26.1937	51.5937
3/64	0.0469		1.0906	26.5906	51.9906
1/16	0.0625	5厘	1.5875	26.9875	52.3875
5/64	0.0781		1.9844	27.3844	52.7844
3/32	0.0937	7厘半	2.3812	27.7812	53.1812
7/64	0.1094		2.7781	28.1781	53.5781
1/8	0.1250	1分	3.1750	28.5750	53.9750
9/64	0.1406		3.5719	28.9719	54.3719
5/32	0.1562	1分2厘半	3.9687	29.3687	54.7687
11/64	0.1719		4.3656	29.7656	55.1656
3/16	0.1875	1分半	4.7625	30.1625	55.5625
13/64	0.2031		5.1594	30.5594	55.9594
7/32	0.2187	1分7厘半	5.5562	30.9562	56.3562
15/64	0.2344		5.9531	31.3531	56.7531
1/4	0.2500	2分	6.3500	31.7500	57.1500
17/64	0.2656		6.7465	32.1469	57.5469
9/32	0.2812	2分2厘半	7.1437	32.5437	57.9437
19/64	0.2969		7.5406	32.9406	58.3406
5/16	0.3125	2分半	7.9375	33.3375	58.7375
21/64	0.3281		8.3344	33.7333	59.1344
11/32	0.3437	2分7厘半	8.7312	34.1312	59.5312
23/64	0.3594		9.1281	34.5281	59.9281
3/8	0.3750	3分	9.5250	34.9250	60.3250
25/64	0.3906		9.9219	35.3219	60.7219
13/32	0.4062	3分2厘半	10.3187	35.7187	61.1187
27/64	0.4219		10.7156	36.1156	61.5156
7/16	0.4375	3分半	11.1125	36.5125	61.9125
29/64	0.4531		11.5094	36.9094	62.3094
15/32	0.4687	3分7厘半	11.9062	37.3062	62.7062
31/64	0.4844		12.3031	37.7031	63.1031
1/2	0.5000	4分	12.7000	38.1000	63.5000

吋 Inch		俚語 Slang	厘米 mm		
分數 mm	小數 Fraction			1"	2"
33/64	0.5156		13.0969	38.4969	63.8969
17/32	0.5312	4分2厘半	13.4937	38.8937	64.2937
35/64	0.5469		13.8906	39.2906	64.6906
9/16	0.5625	4分半	14.2875	39.6875	65.0875
37/64	0.5781		14.6844	40.0844	65.4844
19/32	0.5937	4分7厘半	15.0812	40.4812	65.8812
39/64	0.6094		15.4781	40.8781	66.2781
5/8	0.6250	5分	15.8750	41.2750	66.6750
41/64	0.6406		16.2719	41.6719	67.0719
21/32	0.6562	5分2厘半	16.6687	42.0687	67.4687
43/64	0.6719		17.0656	42.4656	67.8656
11/16	0.6875	5分半	17.4625	42.8625	68.2625
45/64	0.7031		17.8594	43.2594	68.6594
23/32	0.7187	5分7厘半	18.2562	43.6562	69.0562
47/64	0.7344		18.6531	44.0531	69.4531
3/4	0.7500	6分	19.0500	44.4500	69.8500
49/64	0.7656		19.4469	44.8469	70.2469
25/32	0.7812	6分2厘半	19.8437	45.2437	70.6437
51/64	0.7969		20.2406	45.6406	71.0406
13/16	0.8125	6分半	20.6375	46.0375	71.4375
53/64	0.8281		21.0344	46.4344	71.8344
27/32	0.8437	6分7厘半	21.4312	46.8312	72.2312
55/64	0.8594		21.8281	47.2281	72.6281
7/8	0.8750	7分	22.2250	47.6250	73.0250
57/64	0.8906		22.6219	48.0219	73.4219
29/32	0.9062	7分2厘半	23.0187	48.4187	73.8187
59/64	0.9219		23.4156	48.8156	74.2156
15/16	0.9375	7分半	23.8125	49.2125	74.6125
61/64	0.9531		24.2094	49.6094	75.0094
31/32	0.9687	7分7厘半	24.6062	50.0062	75.4062
63/64	0.9844		25.0031	50.4031	75.8031
1	1.0000	8分	25.4000	50.8000	76.2000

IN	1	2	3	4	5	6	7	8	9
MM	25.4	50.8	76.2	101.6	127	152.4	177.8	203.2	228.6

攜帶式 鑽頭尖研機

Drill Re-Sharpener Machine



SUS-1
($\phi 2.0-\phi 13.0\text{mm}$)



SUS-2
($\phi 8.0-\phi 25.5\text{mm}$)



輕巧、快速、精準

Compact! Fast! Accurate!

No Skill Is Required Fast Sharpening High Angle Accuracy

Automatic power off when guard is opened



Power indication lamp.

- Designed for sharpening point angle.
- Extending drill service life and drill accuracy.
- Saving considerable tool cost. Upgrading machining efficiency.



Concealed collet holder set with comprehensive sizes



CBN diamond grinding wheel assures extra fine sharpening effect.

鑽頭直徑 Drill Diameter	$\phi 2 \sim \phi 13$	
先端角 Point Angle	118°~135°	
電源 Power Supply	單相 AC110V 50/60Hz	AC220V
回轉數 R.P.M of Motor	5300 R.P.M	
CBN鑽石砂輪 Grinding Wheel	CBN#230 普通鑽頭用 (另備有鑄鋼鑽頭專用的鑽石砂輪)	
重量 Net Weight	7Kg	
研磨形狀 Type of Thinning	X形	X Thinning
標準附件 Standard Accessories	筒夾組(POM)X12個	Collect(POM)X12
	夾頭組	Collect Holder set
	調角度六角扳手 4mm	Hexagon Wrench 4mm

Outstanding Performance; Long Service Life; High Accuracy. User-friendly Design; Easy to operate; Proven Quality.

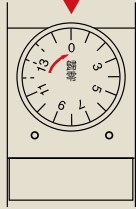
- Employs high quality CBN diamond grinding wheel for superior sharpening effect.
- Concealed collet holder set.
- Mini construction. A portable sharpener designed for easy mobility.
- Automatic power off feature ensures operational safety.

鑽頭尖研機操作說明

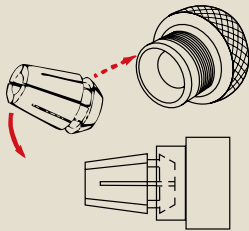
OPERATION

1

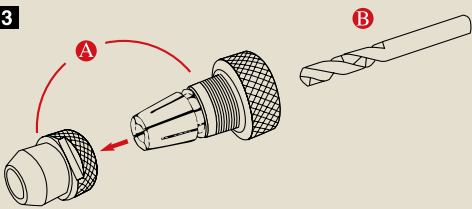
Web Diameter



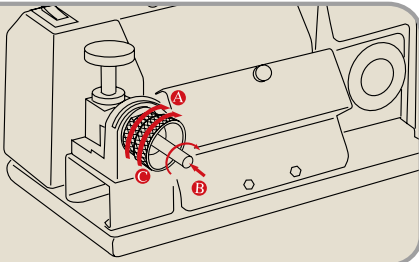
2



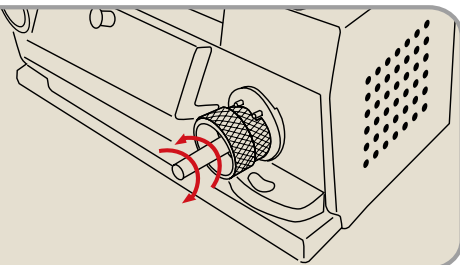
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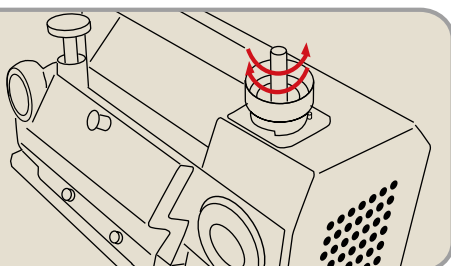
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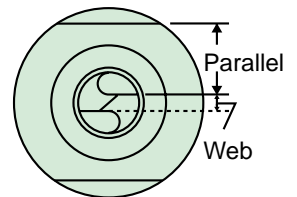
5



6



- The scales of web diameter must meet with the diameter of drill.
 - Choose one right collet. Put collect into collet chuck.
※Put collet into collet chuck with 45° angle.
 - The order of setting operation is: A. Drill B. Collet and collet chuck C. Fix clamping nut.
 - Put the chuck set into the adjustment shelf.
 - Put the chuck set into the adjustment shelf. Then connect it tightly. Turn it right to the end.
 - Plug the drill to the end and turn it right to the end.
 - Turn the chuck set right to the end and tighten it. Turn the chuck set to the left and taking it out gently.
- ※ After having taken out the chuck set, make sure that the point angle of drill is parallel with the slot of fix clamping nut.
If not parallel, adjust again.
Attention! While the drill is grinded, don't hold the stem of drill.



- While the light is on and the motor rotation is stable, put the chuck set into shelf grinding. The slot of fix clamping nut is fitted with the two pins of shelf grinding. Put the drill gently into shelf grinding until reach the grinding slip. Grind the drill by moving left and right until the noise stops. And then turn to the other side. Grind the drill with the same way.
 - ※ The smallest grinding size of drill is 2.0 mm.
 - ※ The point angle of drill is from 118° to 135° .
- For grinding the center of drill and the web of drill, put the chuck set into web thinning. Put the drill gently into shelf grinding until reach the grinding slip. Grind the drill by moving left and right until the noise stops. And then turn to the other side. Grind the drill with the same way.
 - ※ If necessary, use 0.1mm or 0.3mm pads beneath the center of the grinding shelf.
- For extending drill service life, please clean the ash on grinding shelf with air gun after finishing the grinding job.

MEMO