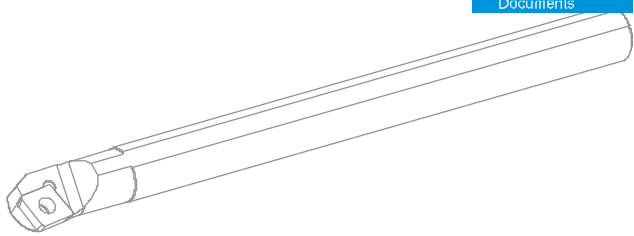


車削加工 Turning Process

V=m/min，F=/刃 Flute　下限值－推薦值－上限值 Min.－Optimum－Max.

切削速度 Cutting speed　m / min　$Vc = \frac{\pi \times Dm \times n}{1000}$

主軸轉速 Spindle speed　r / min　$n = \frac{Vc \times 1000}{\pi \times Dm}$

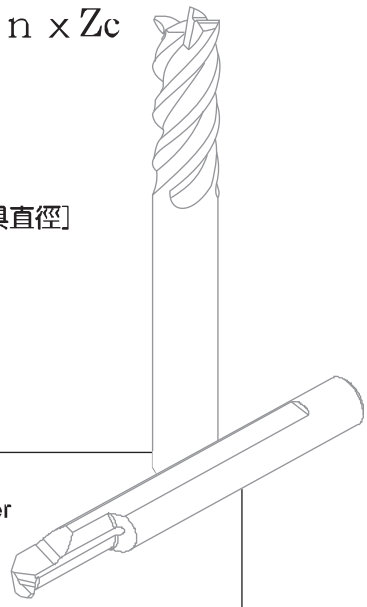
銑削加工 Milling Process

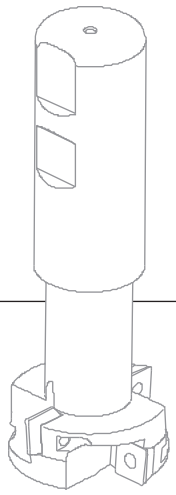
切削速度 Cutting speed　m / min　$Vc = \frac{\pi \times Dc \times n}{1000}$

主軸轉速 Spindle speed　r / min　$n = \frac{Vc \times 1000}{\pi \times Dc}$

工作台進給 The feed of cutting tool　mm / min　$F = fz \times n \times Zc$

每刃進給 vt　mm / t　$fz = \frac{Vf}{Z \times N}$





※ 工具回轉速度＝[1000 × 切削速度]÷[3. 14 × 工具直徑]

N＝[1000 × V]÷[3. 14 × D]

※ 總進給＝[每刃進給 × 工具刃數 × 工具回轉速度]

F＝[fz × Z × N]

π ： 圓週率　Ratio Of Circumference To Diameter

Vc ： 切削速度 (mm)　Cutting Speed

Dc ： 刀具旋轉直徑 (mm)　Diameter Of Work Parts

Dm ： 加工件的直徑 (mm)　Diameter Of Work Parts

n ： 工件或刀具回轉速度 (rpm)　Revolution(s) Per Minute

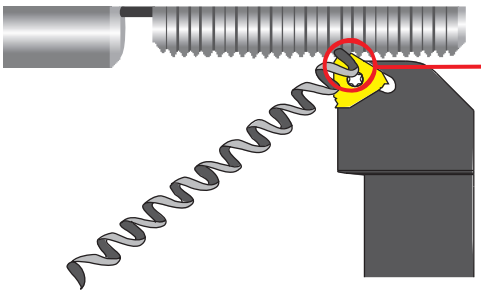
F ： 一分鐘進給速率 (mm / min)　fz

Zc ： 有效切削刃數　Number of flutes

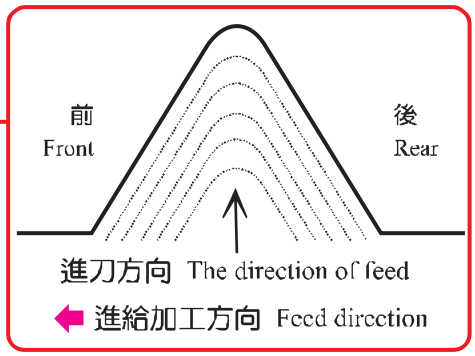
fz ： 每刃進給 (mm / t)　vt

螺紋加工切入方式建議 The Suggestion Of Threading Processing

徑向弧度進給 Radian of feeding



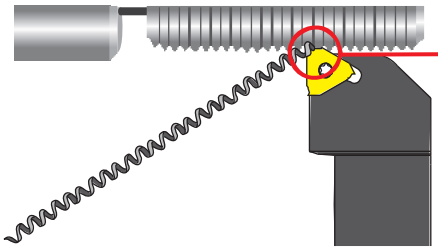
卷屑直徑大
排屑處理不良
Lage curl diameter, not ideal chip remove.



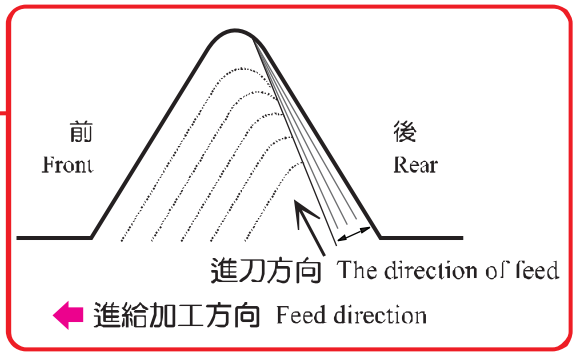
1. 螺距較小時的一般加工方式。
2. 切削條件可易調調整變化。
3. 切削接觸面積大，容易產生震動。
4. 卷屑直徑大，排屑處理不良。
5. 切削刃口端磨損大。

- The processing way during the fine pitch.
- Condition of cutting easily change.
- Huge contacting area of cutting cause vibration easily.
- Large diameter of chip causes poor chip disposal.
- Cutting edges with abrasive wear.

改良側向單刃進給 Modified single flute of side feeding

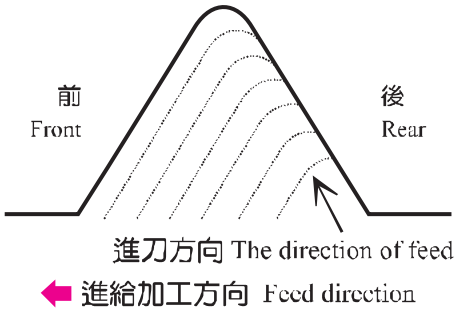


卷屑直徑小
排屑處理優良
Small curl diameter ideal chip remove.



1. 螺距較大時、或加工件韌性較佳時，有效加工方式。
2. 進給方向單一，排屑處理良好。
3. 有效抑制刃口側端的后刀面磨耗。

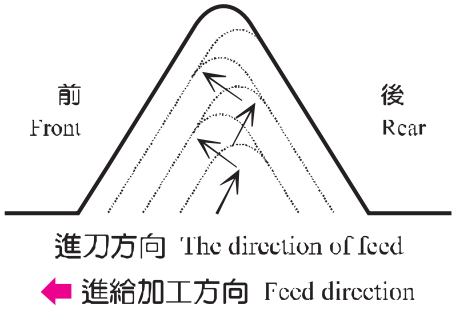
- Single direction of feeding cause better chip disposal.
- Single direction of feeding cause better chip disposal.
- Effectively control the flank wear on the side of cutting edges.



側向單刃進給 Single flute of side feeding

1. 螺距較大時、或加工件韌性較佳時，有效加工方式。
2. 進給方向單一，排屑處理良好
3. 刃口側端磨耗大。

- Processing effectively during coarse pitch or working piece with better stiffness.
- Single direction of feeding cause better chip disposal.
- The side of cutting edges with abrasive wear.



刃口交互進給 Interacting flute of feeding

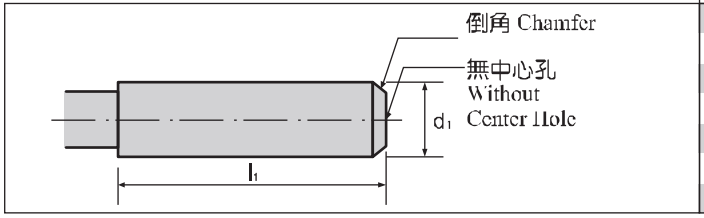
1. 螺距較大時、或加工件韌性較佳時，有效加工方式。
2. 兩端刃口磨耗平均。
3. 因左右刃口交互使用，排屑良率較不佳。

- Processing effectively during coarse pitch or working piece with better stiffness.
- Both side of flute with balanced wear.
- Poor chip disposal due to the use of interacting flutes.

鎢鋼鑽頭DIN6535規範 Carbide Straight Shanks For Twist Drills And End Mills

From HA, plain

尺寸（毫米）Dimensions in mm

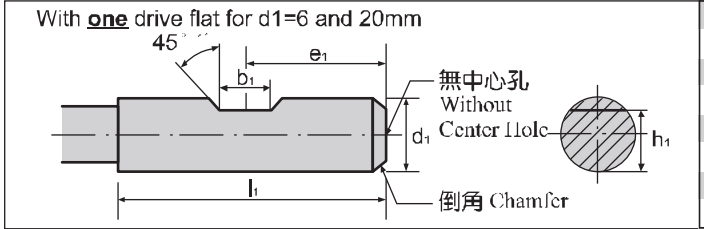


d_1 h6	l_1 +2 0	d_1 h6	l_1 +2 0
2	28	12	45
3	28	14	45
4	28	16	48
5	28	18	48
6	36	20	50
8	36	25	56
10	40	32	60

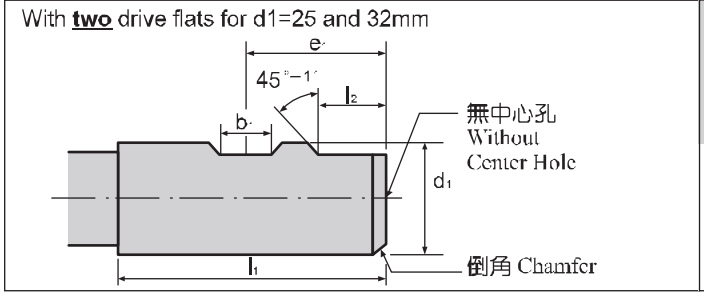
From HB, with drive flat

尺寸（毫米）Dimensions in mm

With **one** drive flat for d1=6 and 20mm



With **two** drive flats for d1=25 and 32mm



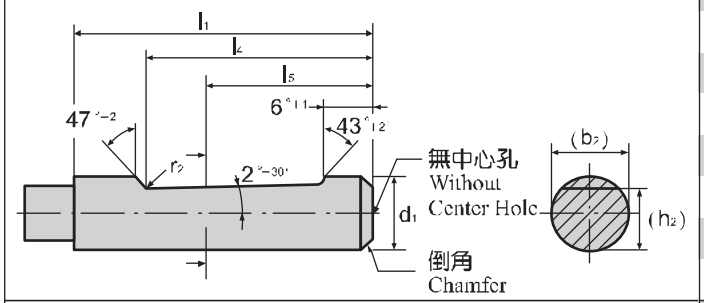
d_1 h_6	b_1 +0.05 0	e_1 0 -1	h_1 h_{11}	l_1 +2 0	l_2 +1 0
6	4.2	18	5.1	36	—
8	5.5	18	6.9	36	—
10	7	20	8.5	40	—
12	8	22.5	10.4	45	—
14	8	22.5	12.7	45	—
16	10	24	14.2	48	—
18	10	24	16.2	48	—
20	11	25	18.2	50	—
25	12	32	23	56	17
32	14	36	30	60	19

From HE, with whistle notch flat without coolant ducts*

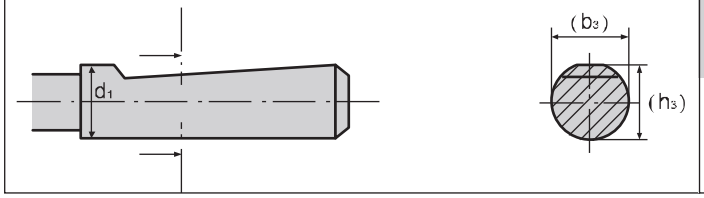
尺寸（毫米）Dimensions in mm

*Design：Straight shanks to DIN 6335 are available with or sithout oil feed holes. Applications for various tools, dimensions and position of oil feed holes are fully described within the standard range sections.

for d1=6 to 20mm



for d1=25 and 32mm

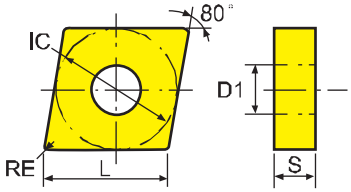


d_1 h6	(b_2) ≃	(d_3)	h_2 h11	(h_3)	l_1 +2 0	l_4 +0 -1	l_5 Dim nom.	r_2 min.
6	4,3	—	5,1	—	36	25	18	1,2
8	5,5	—	6,9	—	36	25	18	1,2
10	7,1	—	8,5	—	40	28	20	1,2
12	8,2	—	10,4	—	45	33	22,5	1,2
14	8,1	—	12,7	—	45	33	22,5	1,2
16	10,1	—	14,2	—	48	36	24	1,6
18	10,8	—	16,2	—	48	36	24	1,6
20	11,4	—	18,2	—	50	38	25	1,6
25	13,6	9,3	23,0	24,1	56	44	32	1,6
32	15,5	9,9	30,0	31,2	60	48	35	1,6

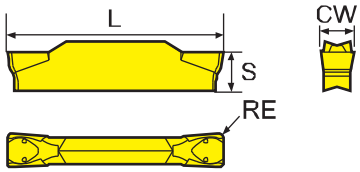
符合ISO13399標準尺寸記號 Comply With ISO13399 Standard Size Notation

(一) 刀片 INSERT (車削、銑削 Turning、Milling)

車削刀片範例：
Insert For Turning



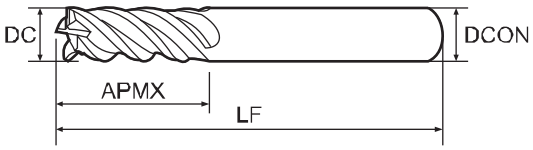
切斷刀片範例：
Cutting Off Insert



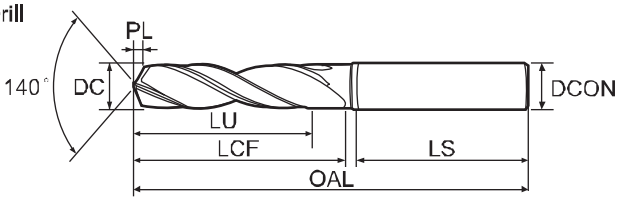
記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
CW	切削寬度 Cutting Width	L	切削刃長度 Cutting Edge Length
D1	螺釘孔徑 Screw Hole	S	刀片厚度 Blade Thickness
IC	內接圓 Inscribed Circle	RE	刀尖半徑 Tip Radius

(二) 鎢鋼端銑刀、鎢鋼鑽頭 CARBIDE END MILL、CARBIDE DILL

鎢鋼端銑刀範例：
Carbide End Mill



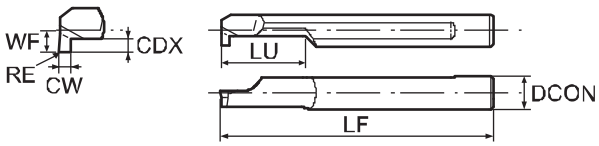
鑽頭範例：
Carbide Drill



記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
APMX	切刃長度 Flute Length	LS	刀柄長度 Length Of Shank
DC	切削直徑 Diameter of Cutting	LU	可使用長度 Effective Length
DCON	柄部直徑 Shank	PL	頂端與肩部尺寸差 Difference Between Top And Shoulder Size
LCF	排屑槽長度 Length of Cutting Flute	RE	刃角R R Edge Angle
LF	標準全長 Full Length	OAL	全長 Total Length

(三) 微小徑內徑鎢鋼車刀 TINY CARBIDE BORING BAR

微小徑內徑鎢鋼車刀範例：
Tiny Carbide Boring Bar

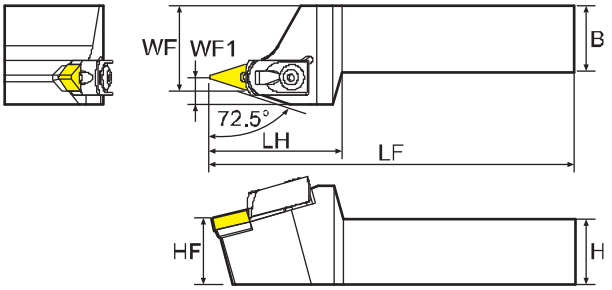


記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
CDX	最大加工溝槽深度 Max Processing Groove Depth	LF	標準全長 Full Length
CW	切削寬度 Cutting Width	LU	可使用長度 Effective Length
DCON	柄部直徑 Shank	RE	刃角R R Edge Angle
DMIN	最小加工徑 Mini Processing Diameter	WF	工作寬度 Width Of Work

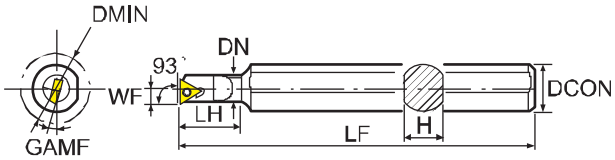
(表內包含研議中的代號，有可能會更變或追加)

(四) 內、外徑車刀架 BORING BAR、TOOL HOLDER

外徑車刀範例：
Turning Tool Holder



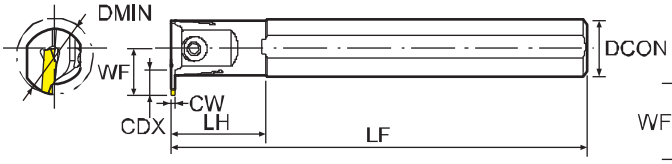
內徑車刀架範例：
Boring Bar



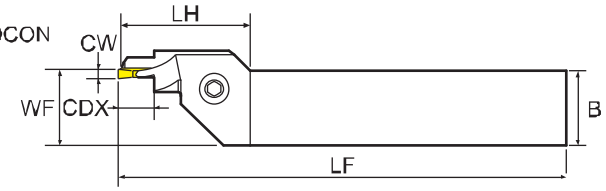
記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
B	刀柄寬度 Shank Width	H	刀桿高度 Holder Shank
DN	頸徑 Neck Shank	HF	刀尖高度 Height Of Tip
DCON	柄部直徑 Shank	LF	標準全長 Full Length
DMIN	最小加工徑 Mini Processing Diameter	LH	刀頭長度 Length Of Tool Head
GAMF	徑向前角 Radial Rake Angle	WF	工作寬度 Width Of Work
		WF1	刀寬 Width Of Insert

(五) 切斷刀架、端面刀架 GROOVING

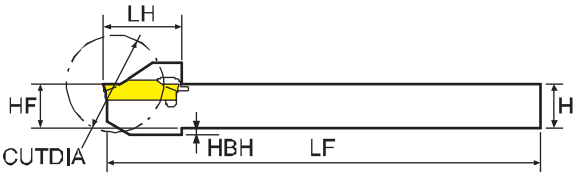
切槽刀範例：
Grooving

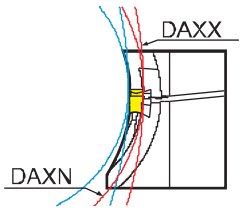


端面刀範例：
Face Grooving



切斷刀範例：
External Grooving



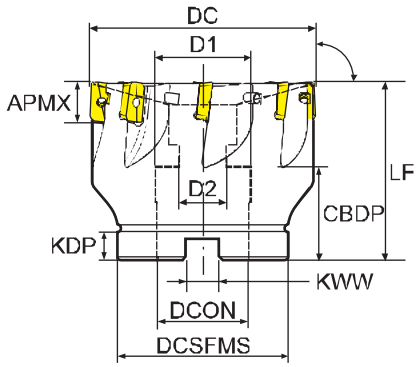


記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
B	刀柄寬度 Shank Width	H	刀桿高度 Height Of Holder
CW	切削寬度 Cutting Width	HF	刀尖高度 Height Of Tip
CDX	最大加工溝槽深度 Max Depth of Page N04	HBH	切削頭底部高度 Height Of Bottom Head
CUTDIA	最大切斷外徑 Max Cutting O.D	LF	標準全長 Full Length
DAXX	端面槽最大加工 Max Face Groove	LH	刀頭長度 Length Of Tool Head
DAXN	端面槽最小加工 Mini Face Groove	LH2	刀頭長度 Length Of Tool Head
DMIN	最小加工徑 Mini Processing Diameter	WF	工作寬度 Width Of Work

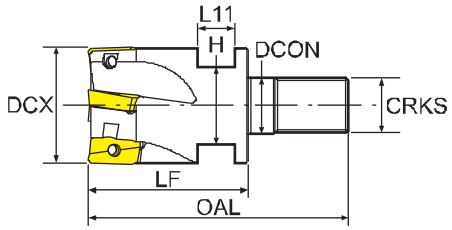
(表內包含研議中的代號，有可能會更變或追加)

(六)銑刀 END EMILL & CUTTER

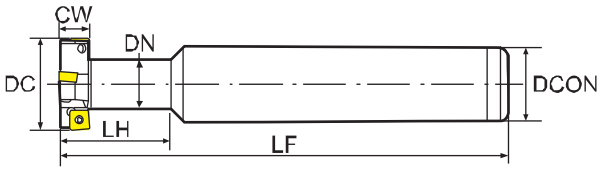
平面銑刀範例：
High speed shoulder face milling cutter



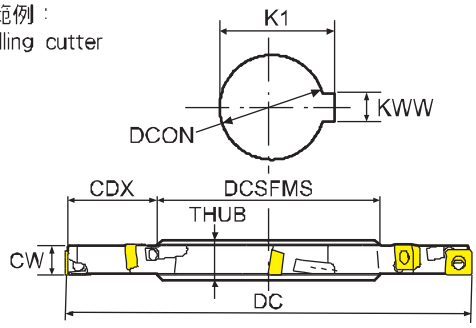
鎖牙式銑刀範例：
Exchangeable head end mill



端銑刀範例：
End mill



側銑刀範例：
Side milling cutter

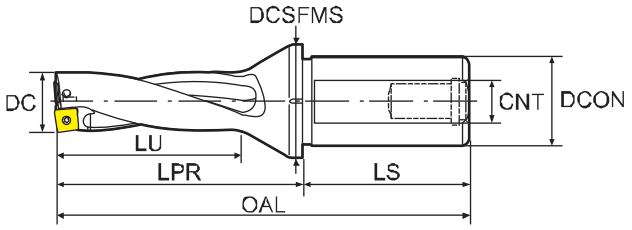


記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
APMX	切刃長度 Flute Length	**DCON**	柄部直徑 Shank
CBDP	安裝孔深度 Installaction Hole Depth	**DCSFMS**	接觸面直徑、法蘭直徑 Diameter Of Contact Face
CICT	刃數 Flute	**H**	側固平面部高度 Side Height
CRKS	ISO螺釘規格 ISO Screw Specifications	**L11**	側固平面部寬度 Side Width
CW	切削寬度 Cutting Width	**LF**	標準全長 Full Length
D1	安裝螺釘尺寸 Mounting Screw Size	**LH**	刀頭長度 Length Of Tool Head
D2	安裝螺釘尺寸 Mounting Screw Size	**K1**	鍵槽高度與柄部直徑 Shank
DC	切削直徑 Diameter of Cutting	**KDP**	鍵槽深度 Keyway Depth
DCX	最大切削直徑 Max Cutting Diameter	**KWW**	鍵槽寬度 Keyway Depth
DN	頸徑 Neck Shank	**THUB**	圓盤型工具厚度 Disk Type Tool Thickness

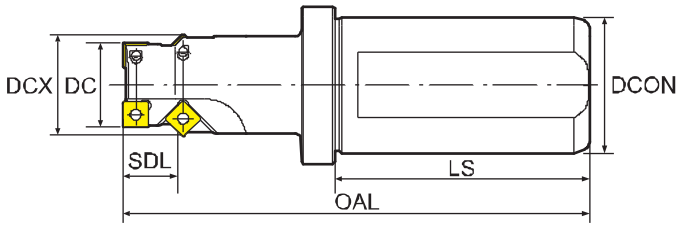
(表內包含研議中的代號，有可能會更變或追加)

(七) 快速鑽頭 RAPID DRILL

快速鑽頭範例：
Rapid Drill



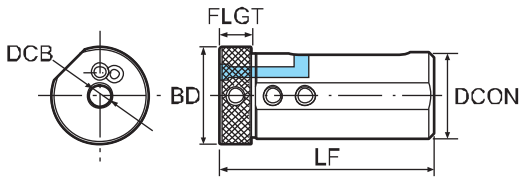
沉頭鑽範例：
Countersunk Drill



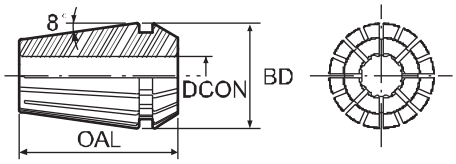
記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
CNT	冷卻液入口螺紋尺寸 Coolant Inlet Thread Size	H	螺絲頭高度 Screw Head Height
CX	倒角 Countersink	LPR	工作懸伸長度 Working Overhang Length
D	螺絲頭直徑 Screw Head Diameter	LS	刀柄長度 Length Of Shank
DC	切削直徑 Diameter of Cutting	LF	標準全長 Full Length
DCX	最大切削直徑 Max Cutting Diameter	LH	刀頭長度 Length Of Tool Head
DCON	柄部直徑 Shank	LU	可使用長度 Effective Length
DCSFMS	接觸面直徑、法蘭直徑 Diameter Of Contact Face	SDL	階梯直徑長度 Step Diameter
d	螺紋 Thread	OAL	全長 Total Length

(八) 機床配件 MACHINE ACCESSORIES (套筒、刀座 Sleeve、Collet)

套筒範例：
Sleeve



筒夾範例：
Collet

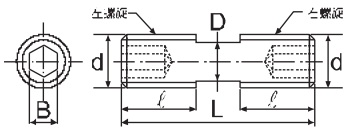
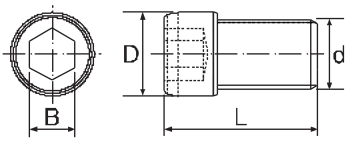
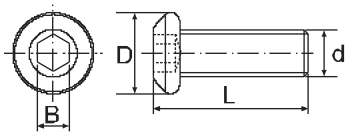
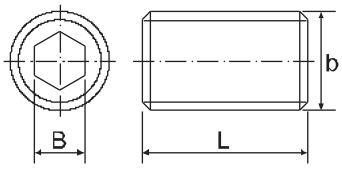
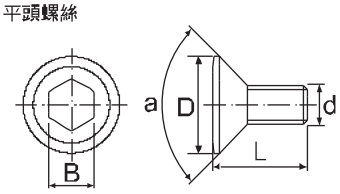


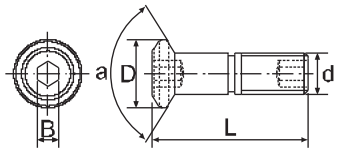
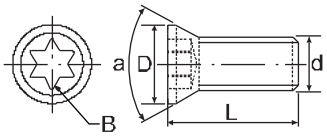
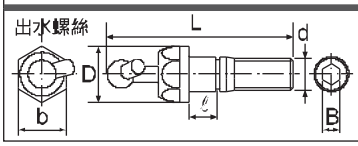
記號 Symbol	中文名稱 Notation Example	記號 Symbol	中文名稱 Notation Example
BD	刀體直徑 Diameter Of Tool Body	H	刀柄高度 Height Of Shank
CRKS	ISO螺釘規格 ISO Screw Specifications	LF	標準全長 Full Length
DCB	刃柄徑、孔徑 Aperture	OAL	全長 Total Length
DCON	柄部直徑 Shank	TD	螺紋直徑 Screw Thread Diameter
FLGT	法蘭厚度 Flange Thickness		

(表內包含研議中的代號，有可能會更變或追加)

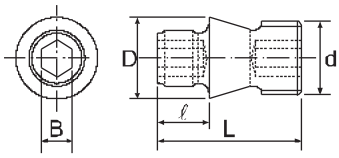
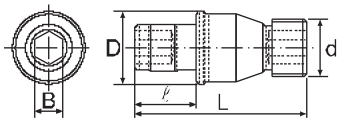
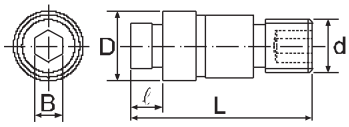
零件 Parts

(一) 螺絲 Screw

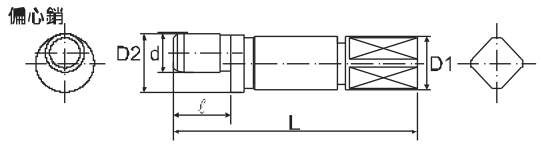
	型號 Model No	在庫 Stock	d	螺距 Pitch	L	D	B	a	b	ℓ
雙頭螺絲 	CS70-20	●	M5	0.8	18	3.6	2.5	–	–	7
	CS70-21	●	M6	1	24	4.5	3	–	–	8.5
	CS70-22	●	M6	1	30	4.5	3	–	–	8.5
	SC8	●	M8	1	18	6	4	–	–	6.8
內六角螺絲 	CS5-0406	●	M4	0.7	8.8	4.8	2.5	–	–	–
	CS6-0306	●	M3	0.5	9	5.4	2.5	–	–	–
	CS6-0406	●	M4	0.7	12	6.9	3	–	–	–
	CS6-0412	●	M4	0.7	16	6.9	3	–	–	–
	CS6-50	●	M5	0.8	21	8.4	4	–	–	–
	CS6-60	●	M6	1	26	10.1	5	–	–	–
	CS6-6015	●	M6	1	21	10.1	5	–	–	–
扁圓頭螺絲 	TP-W1/4	●	W1/4	0.91	16.6	13.5	4	–	–	–
	TP-W5/16	●	W5/16	1.06	21	16.8	5	–	–	–
	CS80	●	M8	1	28.5	12.6	4	–	–	–
	CD6-60	●	M6	1	19.5	10.2	4	–	–	–
	CD6-60-20	●	M6	1	23.5	10.2	4	–	–	–
螺　絲 	ES-306	●	M3	0.5	6	–	1.5	–	–	–
	ES-404	●	M4	0.7	4	–	2	–	–	–
	ES-406	●	M4	0.7	6	–	2	–	–	–
	ES-410	●	M4	0.7	10	–	2	–	–	–
	ES-504	●	M5	0.8	4	–	2.5	–	–	–
	ES-505	●	M5	0.8	5	–	2.5	–	–	–
	ES-506	●	M5	0.8	6	–	2.5	–	–	–
	ES-510	●	M5	0.8	10	–	2.5	–	–	–
	ES-606	●	M6	1	6	–	3	–	–	–
	ES-610	●	M6	1	10	–	3	–	–	–
	ES-806	●	M8	1.25	6	–	4	–	–	–
	ES-808	●	M8	1.25	8	–	4	–	–	–
	ES-810	●	M8	1.25	10	–	4	–	–	–
	ES-1225	●	M12	1.75	25	–	6	–	–	–
	JP06	●	M10	0.9	7.5	–	5	–	–	–
平頭螺絲 	TS408	●	M4	0.7	8	7.9	2.5	91	–	–

螺 絲	型號 Model No	在庫 Stock	d	螺距 Pitch	L	D	B	a	b	ℓ
	CS60E	●	M6	1	21.6	9.5	30	114	—	—
平頭螺絲 	CS18	●	M1.8	0.35	4	2.5	T6	50	—	—
	CS20	●	M2	0.4	5	2.85	T6	60	—	—
	CS22	●	M2.2	0.45	5	3	T7	60	—	—
	CS25	●	M2.5	0.45	6.5	3.65	T8	60	—	—
	CS25048	●	M2.5	0.45	4.74	3.6	T8	60	—	—
	CS30	●	M3	0.5	7	4.3	T10	60	—	—
	CS30A	●	M3	0.5	5.53	4	T8	43	—	—
	CS35	●	M3.5	0.6	8	5.5	T15	60	—	—
	CS35W	●	M3.5	0.6	6.8	4.6	T10	61	—	—
	CS35115	●	M3.5	0.6	11	5.5	T15	60	—	—
	CS40	●	M4	0.7	10	5.8	T15	60	—	—
	CH40	●	M4	0.7	8	5.05	T15	40	—	—
	CS45	●	M4.5	0.75	11	6.8	T15	55	—	—
	CS45115	●	M4.5	0.75	15	6.9	T15	62	—	—
	CS50	●	M5	0.8	12	7.3	T20	58	—	—
	CS60	●	M6	1	17	8	T20	45	—	—
出水螺絲 	CS80AJET	●	M8	1	42.5	12.5	4	—	11	9.3
	CS80BJET	●	M8	1	37.5	12.5	4	—	11	9.1
	CS80CJET	●	M8	1	36.75	12.5	4	—	11	—

(二) 中心銷 Screw Of Shim

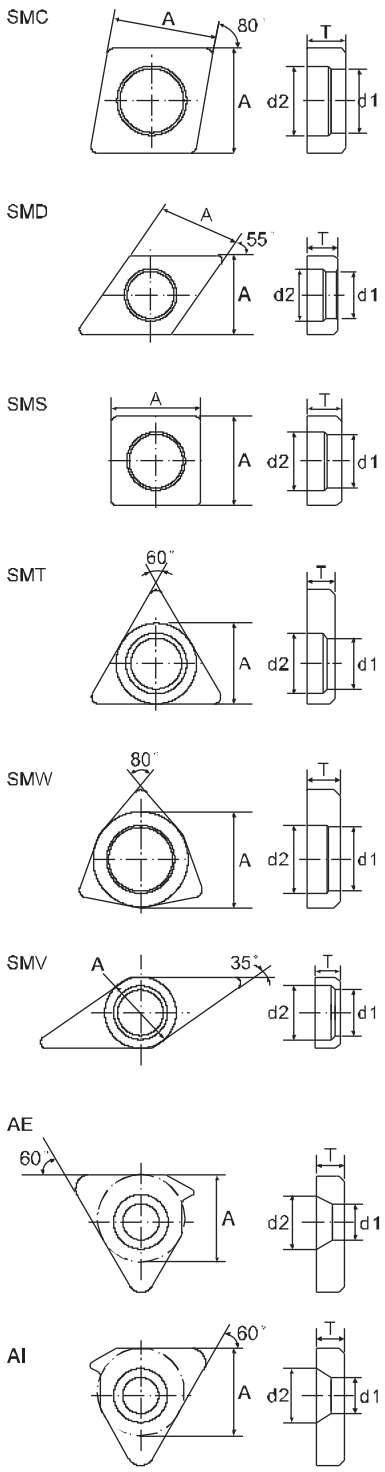
	型號 Model No	在庫 Stock	d	螺距 Pitch	L	ℓ	D	B
 ＊僅右螺旋側有扳手孔	LCS-509	●	M5	0.8	9.5	3.4	5.4	2
	LCS-510	●	M5	0.8	11	4.9	5.4	2
	LCS-511	●	M5	0.8	11	5	5.7	2.5
	＊ LT-1	●	M5	0.8	10.25	4.2	5.55	2.5
	＊ LT-2	●	M5	0.8	11	5	5.5	2.5
	＊ LW-3	●	M5	0.8	11	5	5.7	2.5
	LCS-513	●	M5	0.8	13	4.65	6.2	2
	LCS-617	●	M6.3	1	17.2	5.3	7.8	3
	LCS-619	●	M6.3	1	18.5	6.7	7.8	3
	LD-1	●	M6	1	21.3	3.5	7.8	3
	LT-3	●	M5	0.8	18.5	4.1	6.2	2.5
	LT-4	●	M5	0.8	19	4.3	6.2	2.5
	LW-4	●	M6	1	19	3.65	7.8	3
	LW-4B	●	M6	1	14.6	3.2	7.8	3
	LW-5	●	M8	1	23.6	5.5	10.5	4

(三) 偏心銷 Screw Of Shim



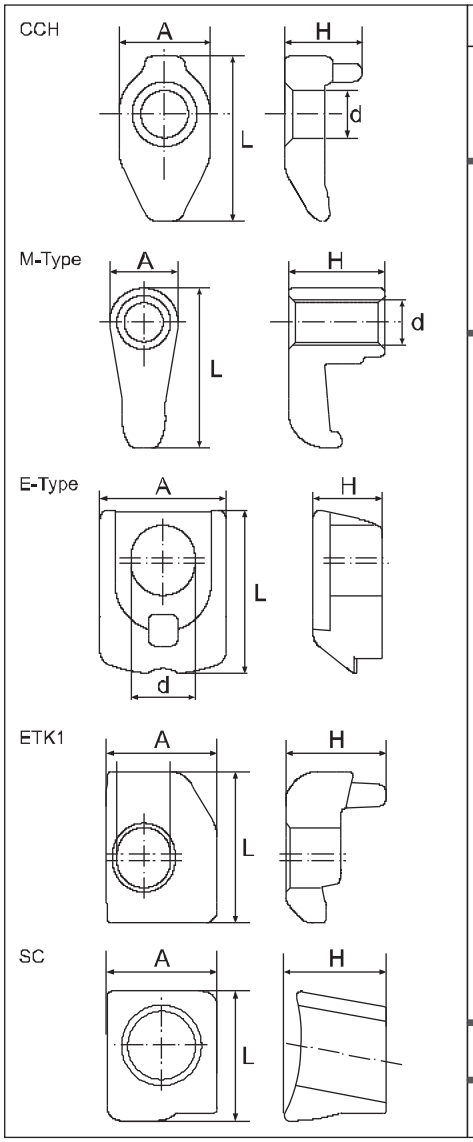
型號 Model No	在庫 Stock	d	D1	D2	L	ℓ
LT-5	●	3.65	5	5.46	21	4.9

(四) 墊片 Shim



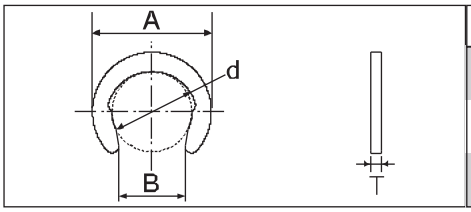
型號 Model No	在庫 Stock	A	T	d1	d2
SMC-416	●	15.5	6.35	9.7	10.9
SMC-432	●	12.58	4.8	7.7	8.35
SMD-363	●	9.24	3.19	5.91	6.7
SMD-463	●	12.2	6.44	7.37	8.18
SMD-466	●	12.26	4.85	7.44	8.36
SMS-432	●	12.4	4.8	7.5	8.1
SMT-322	●	9.13	3.22	5.84	6.74
SMW-406	●	9.23	3.25	6	6.6
SMW-422	●	12.15	4.8	7.45	8.26
SMV-322	●	9.17	3.2	5.9	6.93
AE16	●	9.53	3.2	4.34	6.26
AE22	●	12.57	4	5.1	7.28
AI16	●	9.53	3.20	4.34	6.26
AI22	●	12.57	4	5.1	7.28

(五) 壓板 Clamp



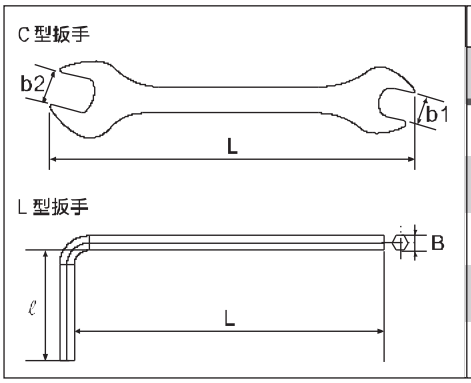
壓板形式 Clamp Type	型號 Model No	在庫 Stock	d	螺距 Pitch	L	A	H
CCH	CCH3.5	●	3.8	–	13.3	7.4	6.3
	CCH4.5	●	4.8	–	14.3	7.8	8.5
M-Type	CP50-21	●	M5	0.8	14.8	7.8	10.8
	CP50-22	●	M6	1	17.3	9.3	13.4
	CP50-24	●	M6	1	21.6	9.3	13.2
E-Type	CN12-2	●	8.5	–	22.9	17.1	9.3
	CN12-4	●	8.6	–	21.6	16.9	9.3
	TN16-2	●	6.5	–	15.4	15.0	7.8
	TN16-3	●	8.2	–	21	15.0	9.4
	WN06-2	●	6.4	–	16.4	10.9	8
	WN08-3	●	6.5	–	16.2	15.0	8
	WN08-4	●	8.4	–	21.4	16.9	9.1
	SN12	●	9.3	–	22	17.0	9.3
	DN11	●	6.6	–	21.7	13.0	9
	DN15	●	9.4	–	27	17.0	9
	VN12	●	6.6	–	23	13.0	9
	VN16	●	6.6	–	25.9	13.0	9
ETK1	ETK1R/L	●	6.2	–	17.5	12.8	11.7
SC	SCR/L	●	M8	1	13	11.1	10.2

(六) C字環 Clasp

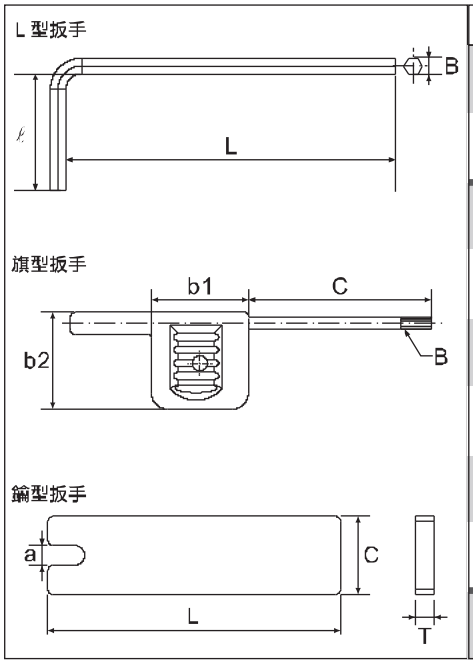


型號 Model No	在庫 Stock	A	B	T	d
C-3	●	5.3	3	0.5	4.2
C-5	●	7	3.9	0.6	4.7
C-6	●	9.7	5.8	0.7	7.8

(七) 扳手 Wrench

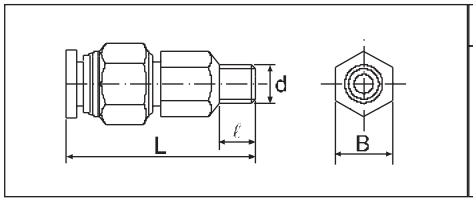


型號 Model No	在庫 Stock	B	b1	b2	L	ℓ	T
CW11	●	–	11	13	139	–	4
LW015	●	1.5	–	–	45.8	13.5	–
LW020	●	2	–	–	50	16	–
LW025	●	2.5	–	–	54.5	17.5	–
LW030	●	3	–	–	96	20	–
LW040	●	4	–	–	103	24	–



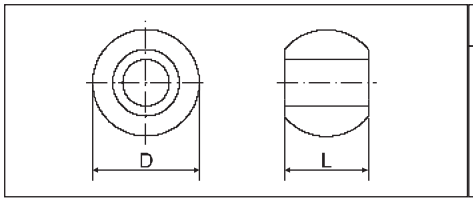
型號 Model No	在庫 Stock	B	C	a	b1	b2	L	ℓ	T
LW050	●	5	–	–	–	–	116	27	–
LW060	●	6	–	–	–	–	115	26	–
T-6	●	T6	36	–	19	19	–	–	–
T-7	●	T7	36	–	19	19	–	–	–
T-8	●	T8	36	–	19	19	–	–	–
T-10	●	T10	45	–	21	28	–	–	–
T-15	●	T15	45	–	21	28	–	–	–
T-20	●	T20	45	–	21	28	–	–	–
GT-40	●	–	16	4.1	–	–	60	–	4

(八) 入水接頭 Gate Connector Plug



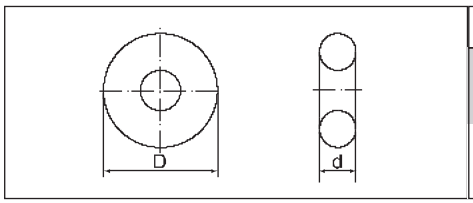
型號 Model No	在庫 Stock	d	螺距 Pitch	L	ℓ	B
PC8-01	●	M8	1	39.5	8	12

(九) 可調出水孔



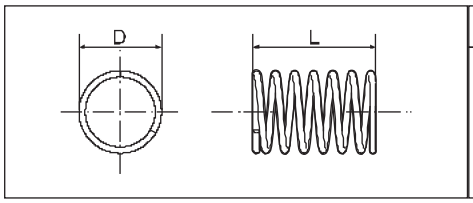
型號 Model No	在庫 Stock	L	D
EHR-O	●	6.3	8

(十) 油封 Clamp



型號 Model No	在庫 Stock	D	d
A5-106	●	8.2	2.7
JP-10	●	12	2

(十一) 彈簧 Spring



型號 Model No	在庫 Stock	L	D
S6	●	11	7.8