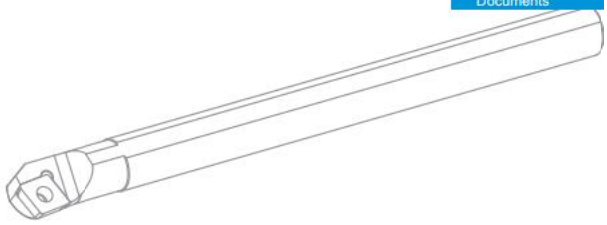
車削加工 Turning Process



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　$n = \frac{Vc \times 1000}{\pi \times Dm}$

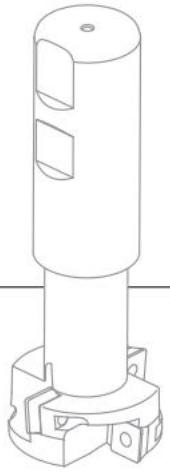
銑削加工 Milling Process

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　$F = f_z \times n \times Zc$

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



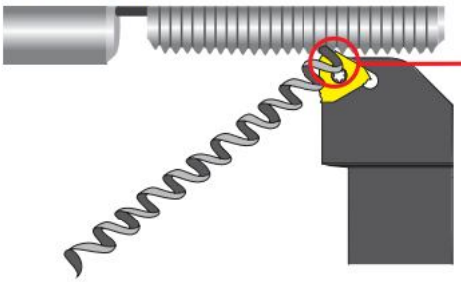
※ 工具回轉速度＝[1000×切削速度]÷[3.14×工具直徑]
N＝[1000×V]÷[3.14×D]

※ 總進給＝[每刃進給×工具刃數×工具回轉速度]
F＝[ft×Z×N]

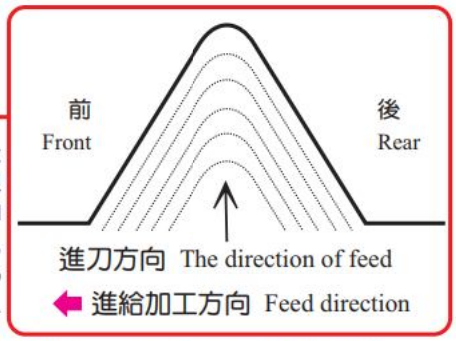
π ：圓週率　Ratio Of Circumference To Diameter
Vc：切削速度 (mm)　Cutting Speed
Dc：刀具旋轉直徑 (mm)　Diameter Of Work Parts
Dm：加工件的直徑 (mm)　Diameter Of Work Parts
n：工件或刀具回轉速度 (rpm)　Revolution(s) Per Minute
F：一分鐘進給速率 (mm / min)　fz
Zc：有效切削刃數　Number of flutes
f_z：每刃進給 (mm / t)　vt

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

徑向弧度進給 Radian of feeding



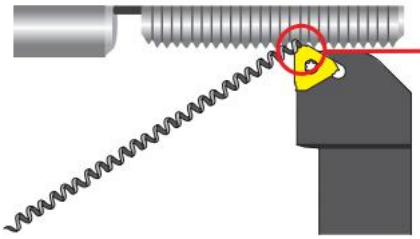
卷屑直徑大
排屑處理不良
Lage curl diameter, not ideal chip remove.



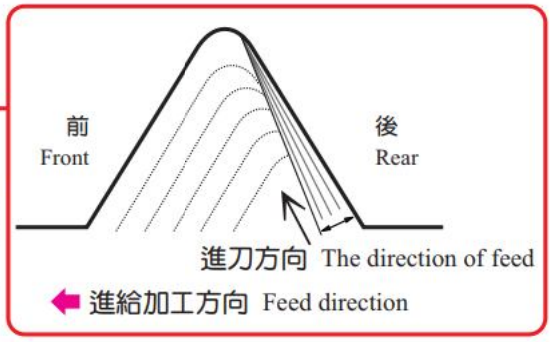
1. 螺距較小時的一般加工方式。
2. 切削條件可易調調整變化。
3. 切削接觸面積大，容易產生震動。
4. 卷屑直徑大，排屑處理不良。
5. 切削刃口端磨損大。

- 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

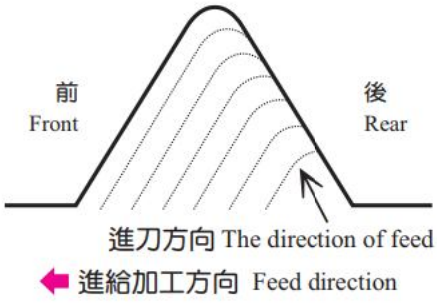


卷屑直徑小
排屑處理優良
Small curl diameter ideal chip remove.



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。

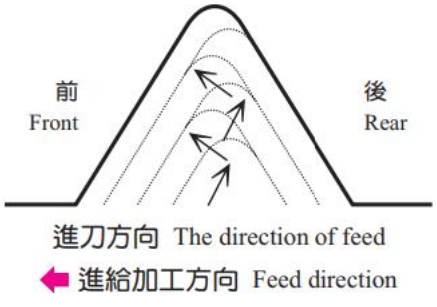
- Single direction of feeding cause better chip disposal.
- Single direction of feeding cause better chip disposal.
- Effectively control the flank wear on the side of cutting edges.



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

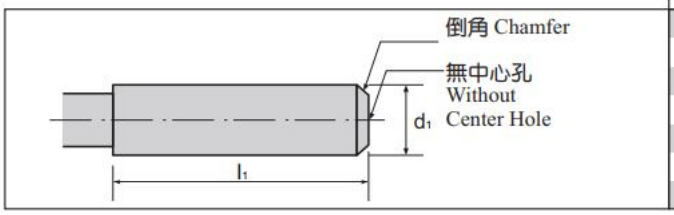
1. 螺距較大時、或加工件韌性較佳時，有效加工方式。
2. 兩端刃口磨耗平均。
3. 因左右刃口交互使用，排屑良率較不佳。

- 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

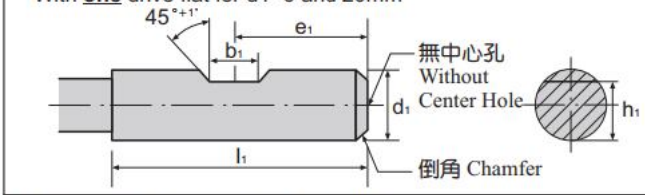


d_1 h6	l_1 +2 0	d_1 h6	l_1 +2 0
2	28	12	45
3	28	14	45
4	28	16	48
5	28	18	48
6	36	20	50
8	36	25	56
10	40	32	60

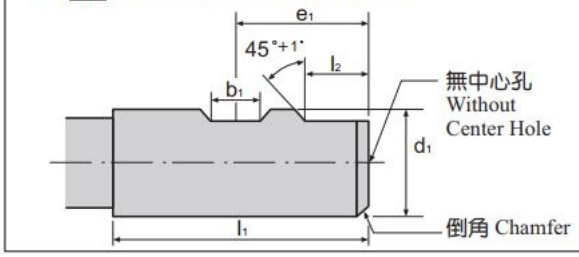
From HB, with drive flat

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



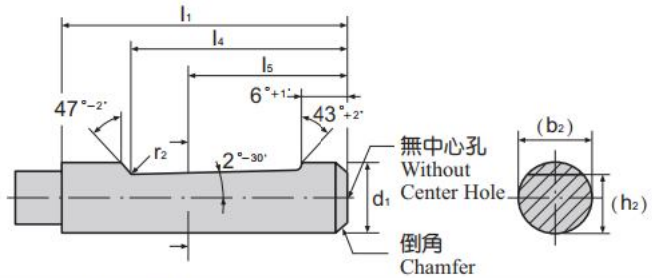
d_1 h_6	b_1 +0.05 0	e_1 0 -1	h_1 h_{11}	l_1 +2 0	l_1 +1 0
6	4.2	18	5.1	36	—
8	5.5	18	6.9	36	—
10	7	20	8.5	40	—
12	8	22.5	10.4	45	—
14	8	22.5	12.7	45	—
16	10	24	14.2	48	—
18	10	24	16.2	48	—
20	11	25	18.2	50	—
25	12	32	23	56	17
32	14	36	30	60	19

From HE, with whistle notch flat without coolant ducts*

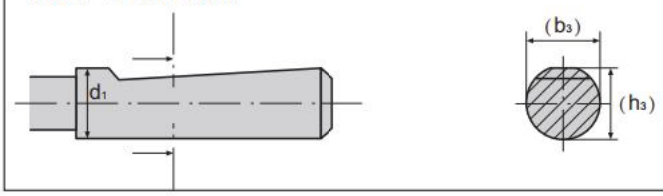
尺寸（毫米）Dimensions in mm

*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



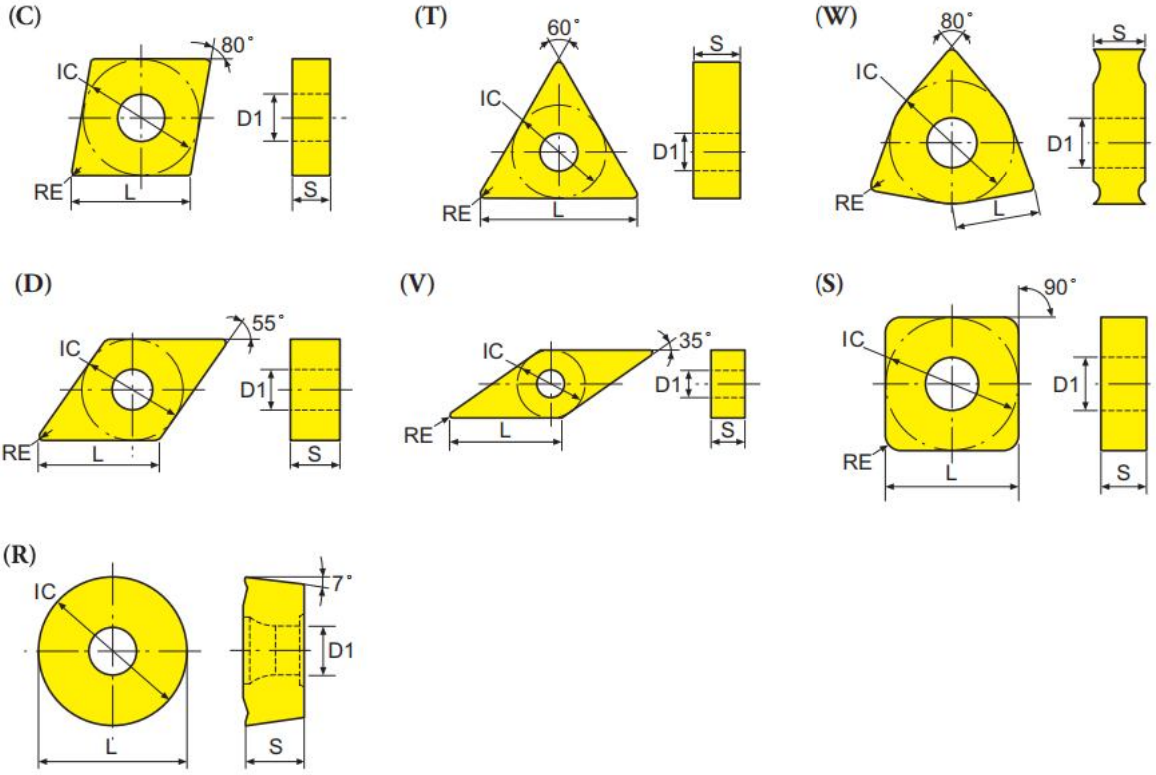
d_1 h6	(b_2) ≃	(d_3)	h_2 h11	(h_3)	l_1 +2 0	l_4 +0 -1	l_5 Dim nom.	r_2 min.
6	4,3	—	5,1	—	36	25	18	1,2
8	5,5	—	6,9	—	36	25	18	1,2
10	7,1	—	8,5	—	40	28	20	1,2
12	8,2	—	10,4	—	45	33	22,5	1,2
14	8,1	—	12,7	—	45	33	22,5	1,2
16	10,1	—	14,2	—	48	36	24	1,6
18	10,8	—	16,2	—	48	36	24	1,6
20	11,4	—	18,2	—	50	38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

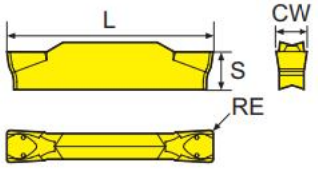
Comply With ISO13399 Standard Size Notation

(一) 刀片 INSERT (車削、銑削 Turning、Milling)

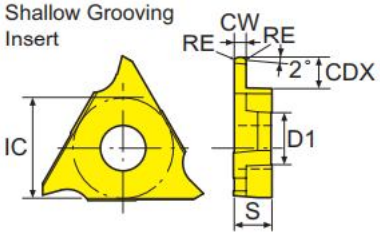
車削刀片範例：
Insert For Turning



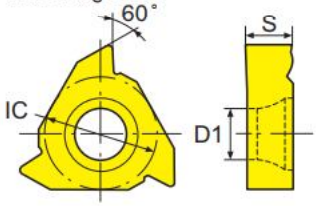
切斷刀片範例：
Cutting Off Insert



槽刀刀片範例：
Shallow Grooving Insert



牙刀刀片範例：
Threading Insert

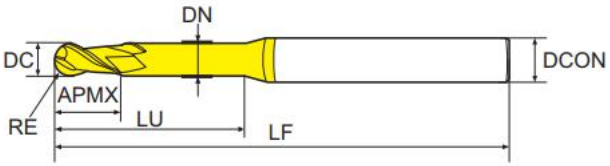


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
CW	切削寬度	Cutting Width
CDX	最大加工溝槽深度	Max Processing Groove Depth
D1	螺釘孔徑	Screw Hole
IC	內接圓	Inscribed Circle
L	切削刃長度	Cutting Edge Length
S	刀片厚度	Blade Thickness
RE	刀尖半徑	Tip Radius

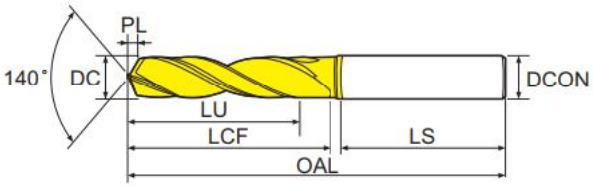
(表內包含研議中的代號，有可能會更變或追加)

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

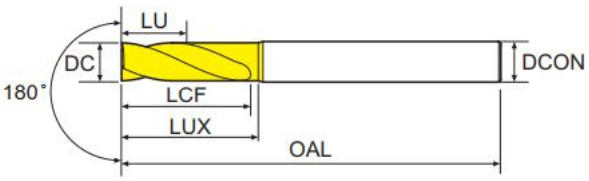
鎢鋼端銑刀範例：
Carbide End Mill



鑽頭範例：
Carbide Drill



平鑽範例：
Carbide Drill

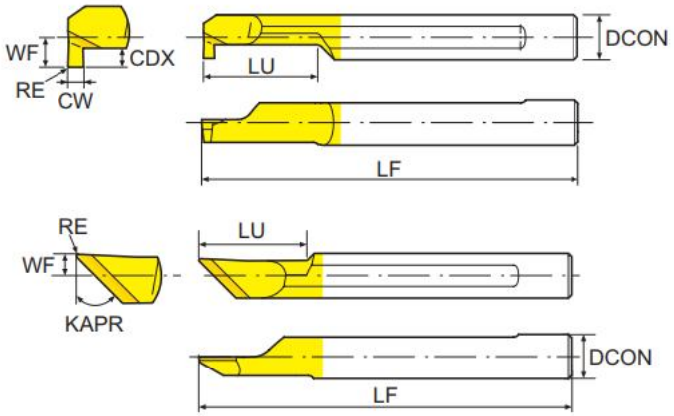


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
APMX	切刃長度	Flute Length
DC	切削直徑	Diameter Of Cutting
DN	頸徑	Neck Shank
DCON	柄部直徑	Shank
LCF	排屑槽長度	Length Of Cutting Flute
LF	標準全長	Full Length
LS	刀柄長度	Length Of Shank
LU	可使用長度	Effective Length
LUX	刀頸長度	Maximum Depth Of Cut
PL	頂端與肩部尺寸差	Difference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

(表內包含研議中的代號，有可能會更變或追加)

(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

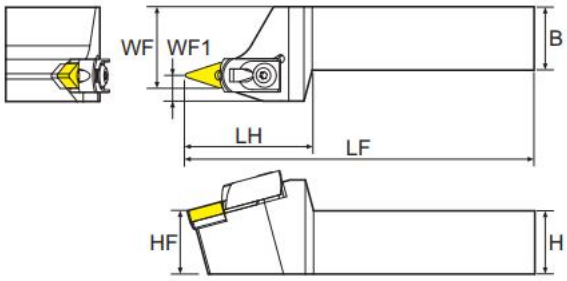


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
CDX	最大加工溝槽深度	Max Processing Groove Depth
CW	切削寬度	Cutting Width
DAXN	端面槽最小加工	Mini Face Groove
DCON	柄部直徑	Shank
DMIN	最小加工徑	Mini Processing Diameter
KAPR	主偏角	Chamfer Angle
LF	標準全長	Full Length
LU	可使用長度	Effective Length
RE	刃角R	R Edge Angle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

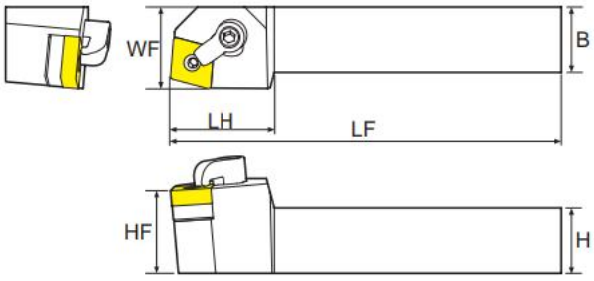
(四) 內、外徑車刀架 BORING BAR、TOOL HOLDER

外徑車刀範例：
Turning Tool Holder

(E-Type)

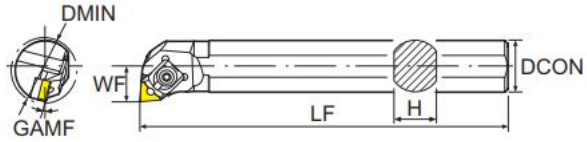


(M-Type)

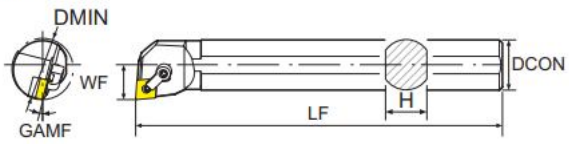


內徑車刀架範例：
Boring Bar

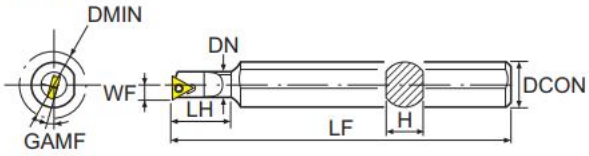
(E-Type)



(M-Type)



(S-Type)

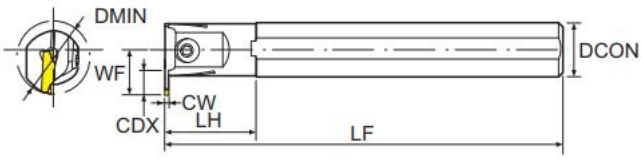


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
B	刀柄寬度	Shank Width
CDX	最大加工溝槽深度	Max Processing Groove Depth
DN	頸徑	Neck Shank
DCON	柄部直徑	Shank
DMIN	最小加工徑	Mini Processing Diameter
GAMF	徑向前角	Radial Rake Angle
H	刀桿高度	Holder Shank
HF	刀尖高度	Height Of Tip
LF	標準全長	Full Length
LH	刀頭長度	Length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

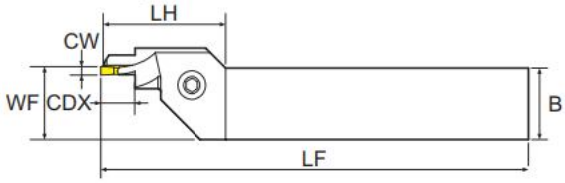
(表內包含研議中的代號，有可能會更變或追加)

(五) 切斷刀架、端面刀架 GROOVING

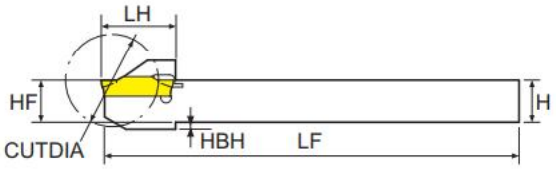
切槽刀範例：
Grooving

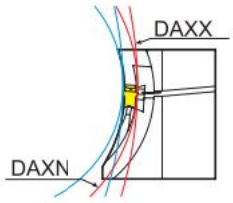


端面刀範例：
Face Grooving



切斷刀範例：
External Grooving

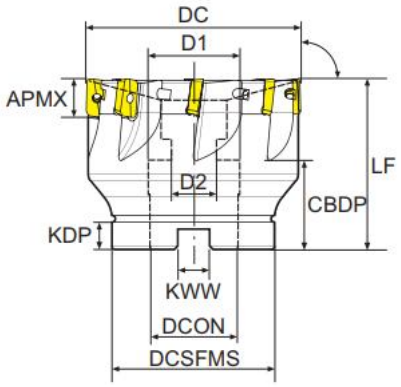




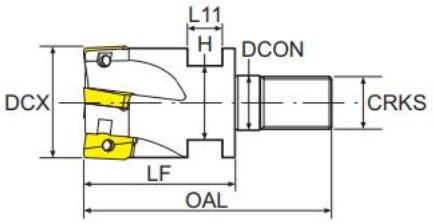
記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
B	刀柄寬度	Shank Width
CW	切削寬度	Cutting Width
CDX	最大加工溝槽深度	Max Processing Groove Depth
CUTDIA	最大切斷外徑	Max Cutting O.D
DAXX	端面槽最大加工	Max Face Groove
DAXN	端面槽最小加工	Mini Face Groove
DMIN	最小加工徑	Mini Processing Diameter
H	刀桿高度	Height Of Holder
HF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

(六)銑刀 END EMILL & CUTTER

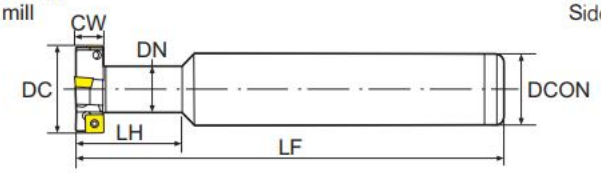
平面銑刀範例：
High speed shoulder face milling cutter



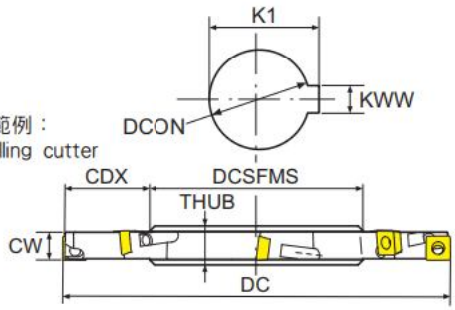
鎖牙式銑刀範例：
Exchangeable head end mill



端銑刀範例：
End mill



側銑刀範例：
Side milling cutter

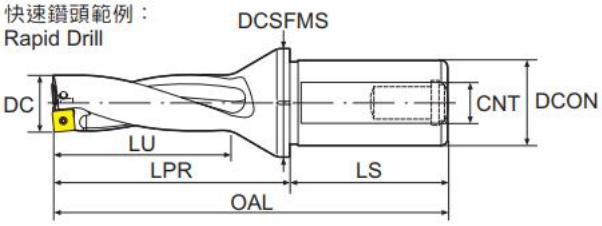


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
APMX	切刃長度	Flute Length
CBDP	安裝孔深度	Installaction Hole Depth
CDX	最大加工溝槽深度	Max Processing Groove Depth
CICT	刃數	Flute
CRKS	ISO螺釘規格	ISO Screw Specifications
CW	切削寬度	Cutting Width
D1、D2	安裝螺釘尺寸	Mounting Screw Size
DC	切削直徑	Diameter Of Cutting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

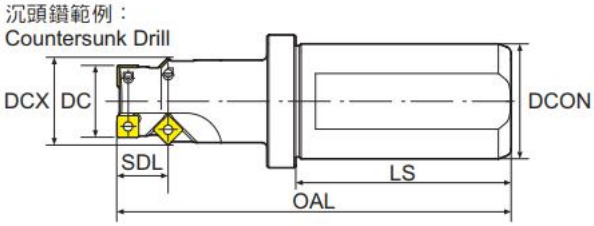
(表內包含研議中的代號，有可能會更變或追加)

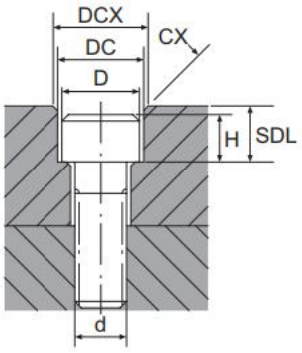
(七) 快速鑽頭 RAPID DRILL

快速鑽頭範例：
Rapid Drill



沉頭鑽範例：
Countersunk Drill



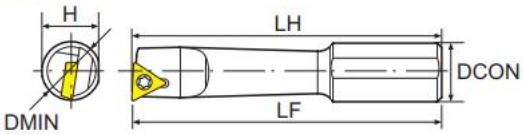


記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
CNT	冷卻液入口螺紋尺寸	Coolant Inlet Thread Size
CX	倒角	Countersink
D	螺絲頭直徑	Screw Head Diameter
DC	切削直徑	Diameter Of Cutting
DCX	最大切削直徑	Max Cutting Diameter
DCON	柄部直徑	Shank
DCSFMS	接觸面直徑、法蘭直徑	Diameter Of Contact Face
d	螺紋	Thread
H	螺絲頭高度	Screw Head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

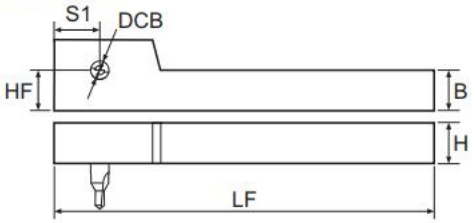
(表內包含研議中的代號，有可能會更變或追加)

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

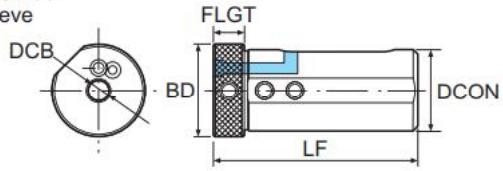
搪孔刀範例：
Boring Tool



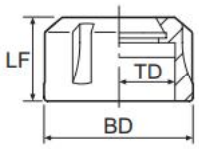
中心鑽刀桿範例：
Centre Drill Holder



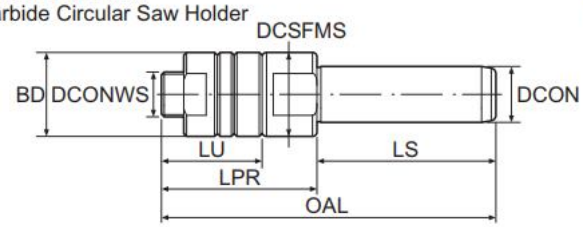
套筒範例：
Sleeve



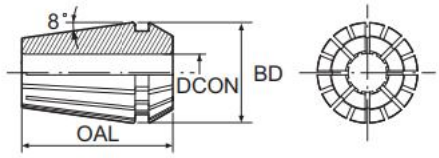
螺母範例：
Nut



圓型鋸片刀桿範例：
Carbide Circular Saw Holder



筒夾範例：
Collet

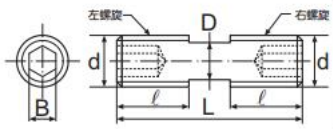
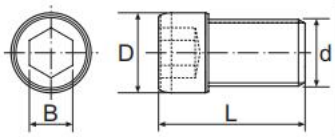
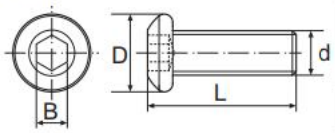
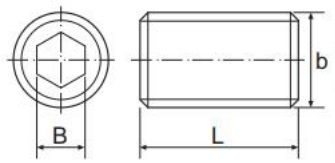
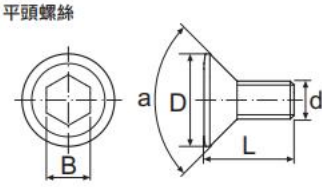


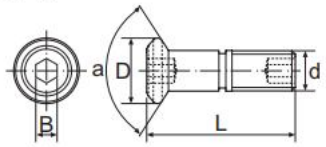
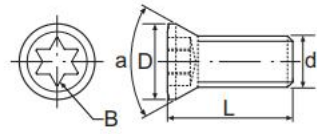
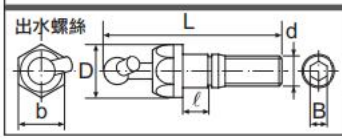
記號 Symbol	中文名稱 Chinese Symbol Example	英文名稱 English Notation Example
BD	刀體直徑	Diameter Of Tool Body
B	刀柄寬度	Shank Width
CRKS	ISO螺釘規格	ISO Screw Specifications
DCB	刃柄徑、孔徑	Aperture
DCON	柄部直徑	Shank
DCONWS	工件端連接直徑	Workpiece Connection Diameter
DCSFMS	接觸面直徑、法蘭直徑	Diameter Of Contact Face
FLGT	法蘭厚度	Flange Thickness
H	刀柄高度	Height Of Shank
LPR	工作縣伸長度	Working Overhang Length
LF	標準全長	Full Length
LH	刀頭長度	Length Of Head
LS	刀柄長度	Length Of Shank
LU	可使用長度	Effective Length
OAL	全長	Total Length
TD	螺紋直徑	Screw Thread Diameter

(表內包含研議中的代號，有可能會更變或追加)

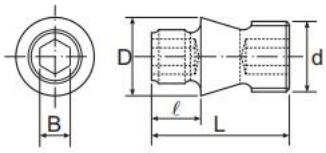
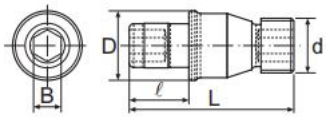
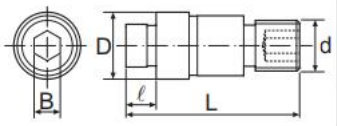
零件 Parts

(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	–	–

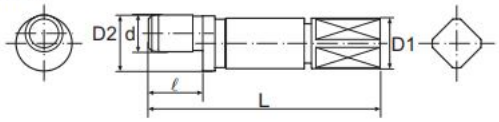
螺 絲	型號 Model No	在庫 Stock	d	螺距 Pitch	L	D	B	a	b	ℓ
	CS60E	●	M6	1	21.6	9.5	30	114	–	–
平頭螺絲	CS18	●	M1.8	0.35	4	2.5	T6	50	–	–
	CS20	●	M2	0.4	5	2.85	T6	60	–	–
	CS22	●	M2.2	0.45	5	3	T7	60	–	–
	CS25	●	M2.5	0.45	6.5	3.65	T8	60	–	–
	CS25048	●	M2.5	0.45	4.74	3.6	T8	60	–	–
	CS30	●	M3	0.5	7	4.3	T10	60	–	–
	CS30A	●	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	60	–	–
	CS45115	●	M4.5	0.75	15	6.9	T15	60	–	–
	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

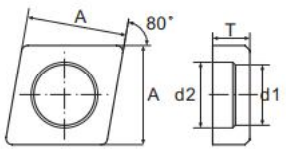
偏心銷



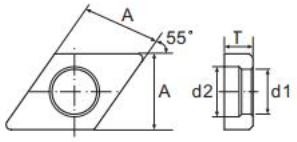
型號 Model No	在庫 Stock	d	D1	D2	L	ℓ
LT-5	●	3.65	5	5.46	21	4.9

(四) 墊片 Shim

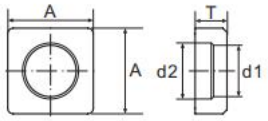
SMC



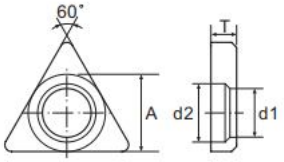
SMD



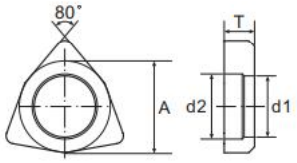
SMS



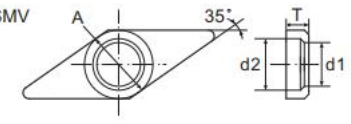
SMT



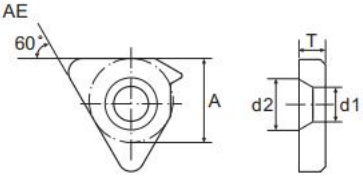
SMW



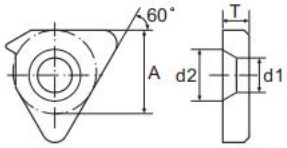
SMV



AE



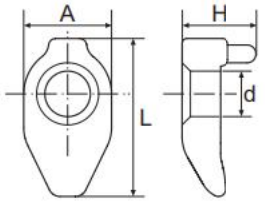
AI



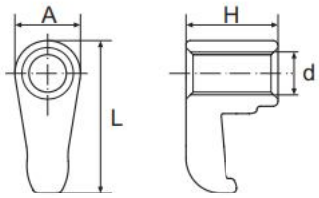
型號 Model No	在庫 Stock	A	T	d1	d2
SMC-416	●	15.5	6.35	9.7	10.9
SMC-432	●	12.58	4.8	7.7	8.35
SMD-363	●	9.24	3.19	5.91	6.7
SMD-463	●	12.2	6.44	7.37	8.18
SMD-466	●	12.26	4.85	7.44	8.36
SMS-432	●	12.4	4.8	7.5	8.1
SMT-322	●	9.13	3.22	5.84	6.74
SMW-406	●	9.23	3.25	6	6.6
SMW-422	●	12.15	4.8	7.45	8.26
SMV-322	●	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

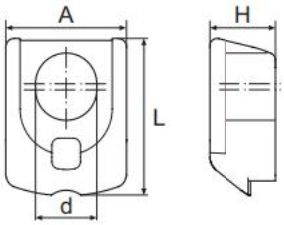
CCH



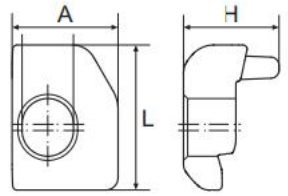
M-Type



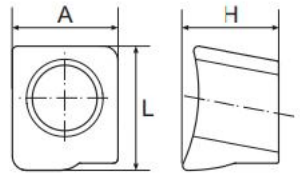
E-Type



ETK1

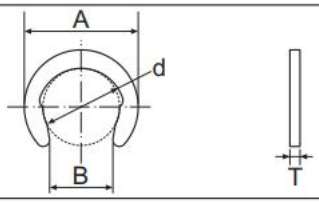


SC



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

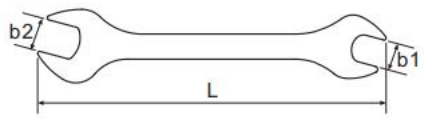
(六) C字環 Clasp



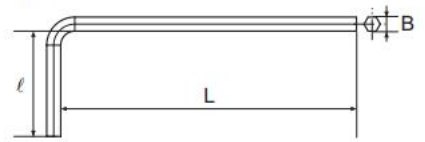
型號 Model No	在庫 Stock	A	B	T	d
C-3	●	5.3	3	0.5	4.2
C-5	●	7	3.9	0.6	4.7
C-6	●	9.7	5.8	0.7	7.8

(七) 扳手 Wrench

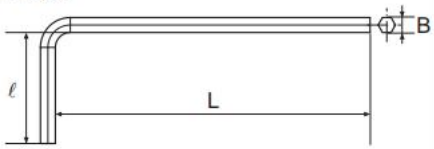
C型扳手



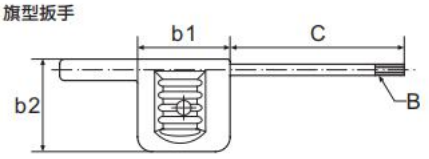
L型扳手



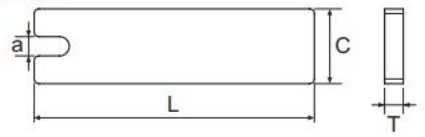
L型扳手



旗型扳手

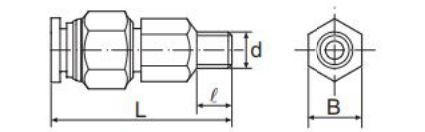


鑰型扳手



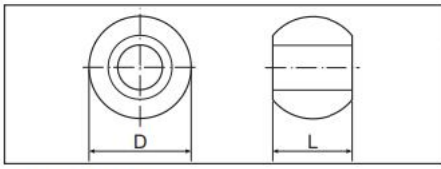
型號 Model No	在庫 Stock	B	C	a	b1	b2	L	ℓ	T
CW11	●	–	–	–	11	13	139	–	4
LW015	●	1.5	–	–	–	–	45.8	13.5	–
LW020	●	2	–	–	–	–	50	16	–
LW025	●	2.5	–	–	–	–	54.5	17.5	–
LW030	●	3	–	–	–	–	96	20	–
LW040	●	4	–	–	–	–	103	24	–
LW050	●	5	–	–	–	–	116	27	–
LW060	●	6	–	–	–	–	115	26	–
T-6	●	T6	36	–	19	19	–	–	–
T-7	●	T7	36	–	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



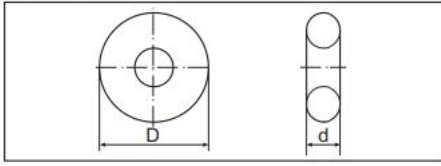
型號 Model No	在庫 Stock	d	螺距 Pitch	L	ℓ	B
PC8-01	●	M8	1	39.5	8	12

(九) 可調出水孔



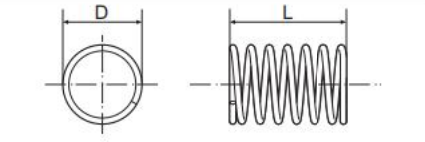
型號 Model No	在庫 Stock	L	D
EHR-O	●	6.3	8

(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