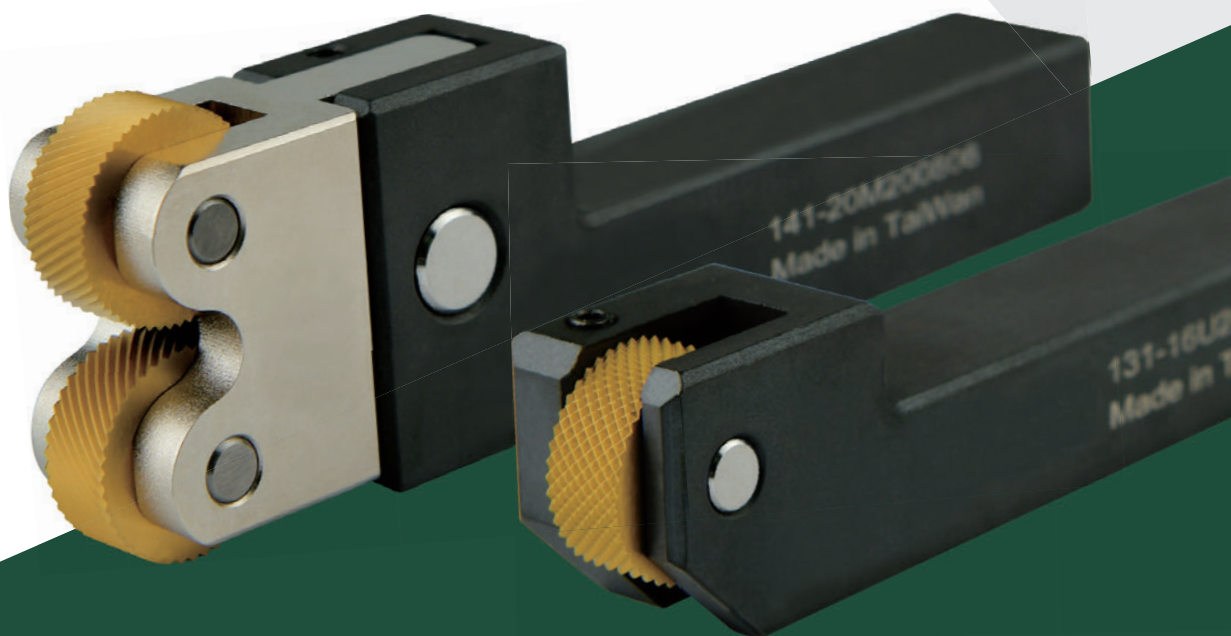
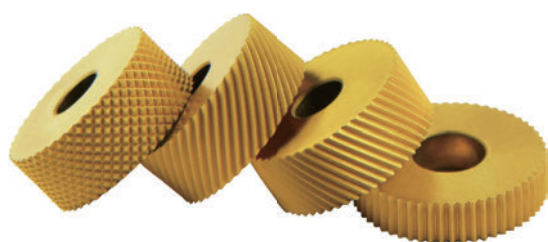
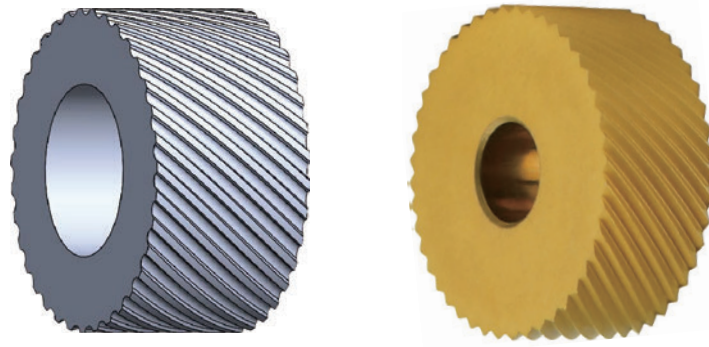


KNURLING TOOL SERIES

滾壓花刀系列



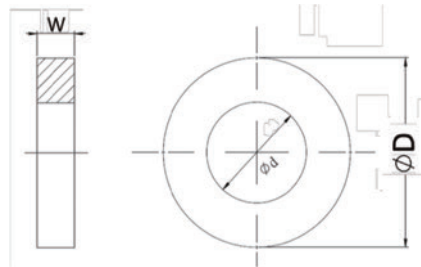


車花刀 VS. 壓花刀 Cut Knurling Tool vs. Form Knurling Tool

類別 Category	車花刀 Cut Knurling Tool	壓花刀 Feature
加工方式 Working Method	利用車花輪切削金屬表面產生花紋 Uses a cut knurl wheel to cut patterns into the metal surface.	利用滾輪壓入金屬表面呈形花紋 Uses a form knurl wheel to form patterns on the metal surface.
特點 Features	切削動作、紋路清晰、精度高 Cutting operation, clear patterns, high precision.	採壓入加工、加工快速、適用性廣泛 Pressing operation, fast processing, wide applicability.
適用材料 Suitable Materials	較硬材料、不易變形工件 Harder materials, less prone to deformation.	中低硬度材料、塑性較佳的材料 Medium to low hardness materials, better plasticity.
加工效果 Processing Effect	紋路深、銳利、不易變形 Deep, sharp patterns, minimal deformation.	紋路較鈍、表面變形較大 Blunt patterns, more surface deformation.
安裝方式 Installation Method	車花輪需傾斜安裝 Cut knurl wheel needs to be installed at an angle.	壓花輪水平安裝 Form knurl wheel installed horizontally.
適用場景 Applicable Scenarios	需求精度高，如航太零件 High-precision requirements, e.g., aerospace components.	一般手工具，如防滑旋鈕等 General hand tools, anti-slip screws, etc.



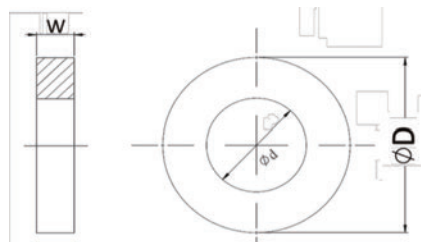
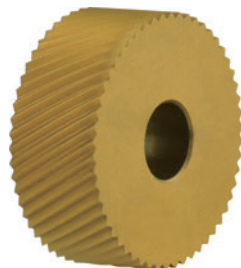
壓花輪 Form Knurl Wheel



規格 Spec.	樣式 Type	螺旋角 Angle	直徑 D	厚度 W	內孔 d	PITCH
BR30-1004-Pitch	BR	30	10	4	4	0.3~1.5
BR30-1504-Pitch	BR	30	15	4	4	0.3~1.5
BR30-1506-Pitch	BR	30	15	6	4	0.3~1.5
BR30-2006-Pitch	BR	30	20	6	6	0.4~1.6
BR30-2008-Pitch	BR	30	20	8	6	0.3~2.0
BR30-2010-Pitch	BR	30	20	10	6	0.5~2.0
BR30-2508-Pitch	BR	30	25	8	6	0.6~1.5
BR45-1004-Pitch	BR	45	10	4	4	0.3~1.5
BR45-1504-Pitch	BR	45	15	4	4	0.3~1.5
BR45-1506-Pitch	BR	45	15	6	4	0.3~1.5
BR45-2006-Pitch	BR	45	20	6	6	0.4~1.6
BR45-2008-Pitch	BR	45	20	8	6	0.3~2.0
BR45-2010-Pitch	BR	45	20	10	6	0.5~2.0
BR45-2508-Pitch	BR	45	25	8	6	0.6~1.5

* 訂購時需確認 Pitch 尺寸

* Please specify the pitch size when ordering.



規格 Spec.	樣式 Type	螺旋角 Angle	直徑 D	厚度 W	內孔 d	PITCH
BL30-1004-Pitch	BL	30	10	4	4	0.3~1.5
BL30-1504-Pitch	BL	30	15	4	4	0.3~1.5
BL30-1506-Pitch	BL	30	15	6	4	0.3~1.5
BL30-2006-Pitch	BL	30	20	6	6	0.4~1.6
BL30-2008-Pitch	BL	30	20	8	6	0.3~2.0
BL30-2010-Pitch	BL	30	20	10	6	0.5~2.0
BL30-2508-Pitch	BL	30	25	8	6	0.6~1.5
BL45-1004-Pitch	BL	45	10	4	4	0.3~1.5
BL45-1504-Pitch	BL	45	15	4	4	0.3~1.5
BL45-1506-Pitch	BL	45	15	6	4	0.3~1.5
BL45-2006-Pitch	BL	45	20	6	6	0.4~1.6
BL45-2008-Pitch	BL	45	20	8	6	0.3~2.0
BL45-2010-Pitch	BL	45	20	10	6	0.5~2.0
BL45-2508-Pitch	BL	45	25	8	6	0.6~1.5

* 訂購時需確認 Pitch 尺寸

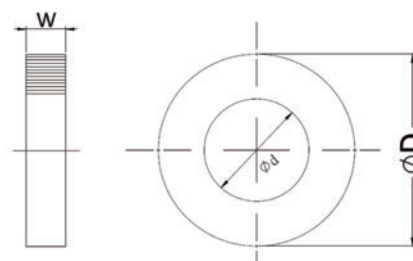
* Please specify the pitch size when ordering.

• 長度單位 Unit of Length (mm)

滾壓花刀系列 KNURLING TOOL SERIES



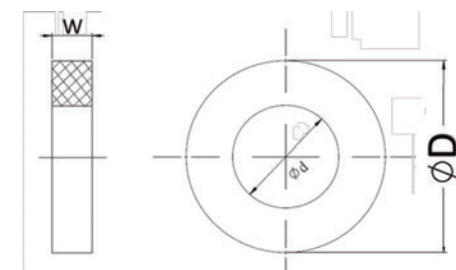
壓花輪 Form Knurl Wheel



規格 Spec.	樣式 Type	螺旋角 Angle	直徑 D	厚度 W	內孔 d	PITCH
AA00-1004-Pitch	AA	0	10	4	4	0.3~1.5
AA00-1504-Pitch	AA	0	15	4	4	0.3~1.5
AA00-1506-Pitch	AA	0	15	6	4	0.3~1.5
AA00-2006-Pitch	AA	0	20	6	6	0.4~1.6
AA00-2008-Pitch	AA	0	20	8	6	0.3~2.0
AA00-2010-Pitch	AA	0	20	10	6	0.5~2.0
AA00-2508-Pitch	AA	0	25	8	6	0.6~1.5

* 訂購時需確認 Pitch 尺寸

* Please specify the pitch size when ordering.



規格 Spec.	樣式 Type	螺旋角 Angle	直徑 D	厚度 W	內孔 d	PITCH
GE30-1004-Pitch	GE	30	10	4	4	0.3~1.5
GE30-1504-Pitch	GE	30	15	4	4	0.3~1.5
GE30-1506-Pitch	GE	30	15	6	4	0.3~1.5
GE30-2006-Pitch	GE	30	20	6	6	0.4~1.6
GE30-2008-Pitch	GE	30	20	8	6	0.3~2.0
GE30-2010-Pitch	GE	30	20	10	6	0.5~2.0
GE30-2508-Pitch	GE	30	25	8	6	0.6~2.0
GE45-1004-Pitch	GE	45	10	4	4	0.3~1.5
GE45-1504-Pitch	GE	45	15	4	4	0.3~1.5
GE45-1506-Pitch	GE	45	15	6	4	0.3~1.5
GE45-2006-Pitch	GE	45	20	6	6	0.4~1.6
GE45-2008-Pitch	GE	45	20	8	6	0.3~2.0
GE45-2010-Pitch	GE	45	20	10	6	0.5~2.0
GE45-2508-Pitch	GE	45	25	8	6	0.6~2.0

* 訂購時需確認 Pitch 尺寸

* Please specify the pitch size when ordering.

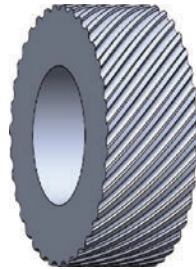


車花輪

Cut Knurl Wheel



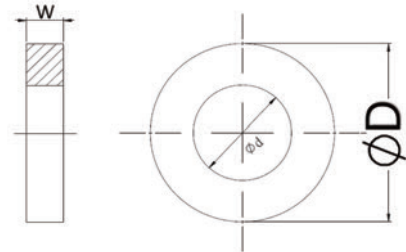
TYPE : BR



TYPE : BL



TYPE : AA



規格 Spec.	樣式 Type	螺旋角 Angle	直徑 D	厚度 W	內孔 d	PITCH
TBR15-089024-Pitch	BR	15	8.9	2.4	4	0.3~1.0
TBR15-100030-Pitch	BR	15	10	3	6	0.5~1.2
TBR15-145030-Pitch	BR	15	14.5	3	5	0.5~1.2
TBR15-150040-Pitch	BR	15	15	4	8	0.5~1.2
TBR15-215050-Pitch	BR	15	21.5	5	8	0.6~2.0
TBR15-250060-Pitch	BR	15	25	6	8	0.5~2.0
TBR30-089024-Pitch	BR	30	8.9	2.4	4	0.3~1.0
TBR30-100030-Pitch	BR	30	10	3	6	0.5~1.2
TBR30-145030-Pitch	BR	30	14.5	3	5	0.5~1.2
TBR30-150040-Pitch	BR	30	15	4	8	0.5~1.2
TBR30-215050-Pitch	BR	30	21.5	5	8	0.6~2.0
TBR30-250060-Pitch	BR	30	25	6	8	0.5~2.0
TBL15-089024-Pitch	BL	15	8.9	2.4	4	0.3~1.0
TBL15-100030-Pitch	BL	15	10	3	6	0.5~1.2
TBL15-145030-Pitch	BL	15	14.5	3	5	0.5~1.2
TBL15-150040-Pitch	BL	15	15	4	8	0.5~1.2
TBL15-215050-Pitch	BL	15	21.5	5	8	0.6~2.0
TBL15-250060-Pitch	BL	15	25	6	8	0.5~2.0
TBL30-089024-Pitch	BL	30	8.9	2.4	4	0.3~1.0
TBL30-100030-Pitch	BL	30	10	3	6	0.5~1.2
TBL30-145030-Pitch	BL	30	14.5	3	5	0.5~1.2
TBL30-150040-Pitch	BL	30	15	4	8	0.5~1.2
TBL30-215050-Pitch	BL	30	21.5	5	8	0.6~2.0
TBL30-250060-Pitch	BL	30	25	6	8	0.5~2.0
TAA00-089024-Pitch	AA	0	8.9	2.4	4	0.3~1.0
TAA00-100030-Pitch	AA	0	10	3	6	0.5~1.2
TAA00-145030-Pitch	AA	0	14.5	3	5	0.5~1.2
TAA00-150040-Pitch	AA	0	15	4	8	0.5~1.2
TAA00-215050-Pitch	AA	0	21.5	5	8	0.6~2.0
TAA00-250060-Pitch	AA	0	25	6	8	0.5~2.0

* 訂購時需確認 Pitch 尺寸

* Please specify the pitch size when ordering.

滾壓花刀系列

KNURLING TOOL SERIES



壓花刀架

Form Knurling Tool



單輪 Single Wheel

規格 Spec.	柄徑 Shank Dia.	適用壓花輪尺寸 Applicable Knurling Wheel Size	適用工件直徑 Applicable Workpiece Dia.
CKT-1616S	16x16mm	10mm、15mm	3mm~50mm
CKT-2020S	20x20mm	20mm、25mm	8mm~200mm
CKT-2520S	25x20mm	20mm、25mm	8mm~200mm



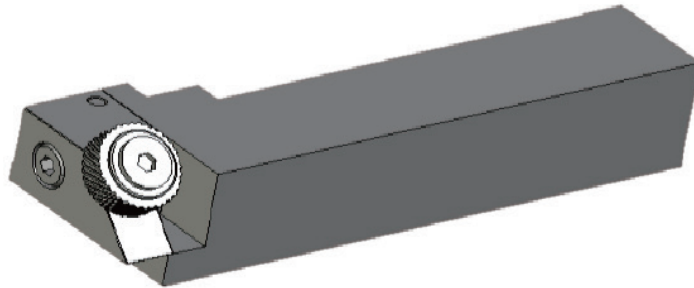
雙輪 Double Wheel

規格 Spec.	柄徑 Shank Dia.	適用壓花輪尺寸 Applicable Knurling Wheel Size	適用工件直徑 Applicable Workpiece Dia.
CKT-1616D	16x16mm	20mm	10mm~110mm
CKT-2020D	20x20mm	20mm	10mm~110mm
CKT-2520D	25x25mm	25mm	10mm~110mm



車花刀架 Cut Knurling Tool

運用車花輪傾斜，創造切削的動作，使車花的效果優於壓花。
Tilting the cut knurling wheel creates a cutting action, resulting in a more defined knurling effect compared to form knurling.



單輪 Single Wheel

規格 Spec.	柄徑 Shank Dia.	適用壓花輪尺寸 Applicable Knurling Wheel Size	適用工件直徑 Applicable Workpiece Dia.
CTTR-1616KS	16x16mm	15mm	3mm~50mm
CTTR-2020MS	20x20mm	21.5mm	10mm~200mm
CTTR-2525MS	25x25mm	21.5mm	10mm~200mm



雙輪 Double Wheel

規格 Spec.	柄徑 Shank Dia.	適用壓花輪尺寸 Applicable Knurling Wheel Size	適用工件直徑 Applicable Workpiece Dia.
CTTR-1616KD	16x16mm	15mm	3mm~50mm
CTTR-2020MD	20x20mm	21.5mm	10mm~200mm
CTTR-2520MD	25x20mm	21.5mm	10mm~200mm

滾壓花刀系列

KNURLING TOOL SERIES

CTTR 車花刀切削條件數據表 Cut knurling tool Cutting Parameter

工件材質 Material of Workpiece	車花輪直徑 Ø of cut knurl wheels	工件直徑 Ø2-12mm Workpiece Dia Ø2-12mm		工件直徑 Ø12-40mm Workpiece Dia Ø12-40mm		工件直徑 Ø40-250mm Workpiece Dia Ø40-250mm		工件直徑 >Ø250mm Workpiece Dia : >Ø250mm	
		線速度 V(m/min)	進給 f (mm/rev)	線速度 V(m/min)	進給 f (mm/rev)	線速度 V(m/min)	進給 f (mm/rev)	線速度 V(m/min)	進給 f (mm/rev)
合金鋼 Steel	8.9 - 11	25	0.04-0.07	25	0.04-0.07	-	-	-	-
	14.5 - 15	35	0.06-0.08	30	0.06-0.08	-	-	-	-
	20 - 21.5	45	0.07-0.14	45	0.06-0.12	40	0.06-0.12	-	-
	25	60	0.08-0.16	60	0.08-0.16	55	0.08-0.16	50	0.08-0.16
不鏽鋼 Stainless steel	8.9 - 11	20	0.04-0.06	20	0.04-0.06	-	-	-	-
	14.5 - 15	30	0.06-0.08	28	0.06-0.08	-	-	-	-
	20 - 21.5	40	0.06-0.12	35	0.06-0.12	32	0.06-0.12	-	-
	25	45	0.08-0.17	45	0.08-0.17	42	0.08-0.17	40	0.08-0.17
灰鑄鐵 Grey cast iron	8.9 - 11	22	0.04-0.06	22	0.04-0.06	-	-	-	-
	14.5 - 15	30	0.06-0.08	28	0.06-0.08	-	-	-	-
	20 - 21.5	40	0.06-0.12	35	0.06-0.12	32	0.06-0.12	-	-
	25	45	0.08-0.17	45	0.08-0.17	42	0.08-0.17	40	0.08-0.17
鑄鐵 Cast steel	8.9 - 11	25	0.04-0.07	25	0.04-0.07	-	-	-	-
	14.5 - 15	35	0.05-0.08	30	0.05-0.08	-	-	-	-
	20 - 21.5	45	0.06-0.12	45	0.06-0.12	40	0.06-0.12		
	25	90	0.08-0.15	90	0.08-0.15	65	0.08-0.15	60	0.08-0.15
銅 Brass	8.9 - 11	60	0.05-0.08	60	0.05-0.08	-	-	-	-
	14.5 - 15	90	0.06-0.12	90	0.06-0.12	-	-	-	-
	20 - 21.5	100	0.10-0.20	100	0.10-0.20	90	0.10-0.20	-	-
	25	140	0.10-0.20	140	0.10-0.20	130	0.10-0.20	115	0.10-0.20
鋁合金 Copper Aluminium	8.9 - 11	60	0.08-0.18	60	0.08-0.18	-	-	-	-
	14.5 - 15	80	0.08-0.18	80	0.08-0.18	-	-	-	-
	20 - 21.5	100	0.10-0.25	100	0.10-0.25	100	0.10-0.25		
	25	135	0.10-0.35	135	0.10-0.35	125	0.10-0.35		

CKT 壓花刀切削條件數據表 Form Knurling tool Cutting Parameter

工件材質 Material of Workpiece	工件直徑 Ø of workpiece	花輪直徑 Ø of form knurl wheels	線速度 V(m/min)	徑向進給 Radial Feed f (mm/rev)	軸向進給 Axial Feed f (mm/rev)			
					節距 : Pitch: 0.3-0.6	節距 : Pitch: 0.6-1.2	節距 : Pitch : 1.2-1.6	節距 : Pitch: 1.6-2.0
合金鋼 Steel	<10	10	20-50	0.04-0.08	0.18	0.10	0.06	0.04
	10-50	15			0.24	0.14	0.10	0.06
		20	20-55		0.28	0.16	0.12	0.08
	50-100	20			0.28	0.16	0.12	0.08
	100-250	25			0.36	0.24	0.14	0.10
	>250	25			0.36	0.24	0.14	0.10
不鏽鋼 Stainless steel	<10	10	20-40	0.04-0.08	0.14	0.08	0.06	0.04
	10-50	15			0.20	0.12	0.10	0.06
		20	20-45		0.25	0.15	0.12	0.08
	50-100	20			0.25	0.15	0.12	0.08
	100-250	25			0.30	0.20	0.14	0.10
	>250	25			0.30	0.20	0.14	0.10
鑄鐵 Cast steel	<10	10	20-40	0.04-0.08	0.14	0.08	0.06	0.04
	10-50	15			0.20	0.12	0.10	0.06
		20	20-45		0.25	0.15	0.12	0.08
	50-100	20			0.25	0.15	0.12	0.08
	100-250	25			0.30	0.20	0.14	0.10
	>250	25			0.30	0.20	0.14	0.10
銅 Brass	<10	10	35-75	0.04-0.08	0.25	0.15	0.10	0.08
	10-50	15			0.30	0.20	0.15	0.10
		20	45-90		0.40	0.25	0.20	0.15
	50-100	20			0.40	0.25	0.20	0.15
	100-250	25			0.50	0.30	0.20	0.15
	>250	25			0.50	0.30	0.20	0.15
鋁合金 Copper Aluminium	<10	10	35-75	0.04-0.08	0.25	0.15	0.10	0.08
	10-50	15			0.30	0.20	0.15	0.10
		20	45-90		0.40	0.25	0.20	0.15
	50-100	20			0.40	0.25	0.20	0.15
	100-250	25			0.50	0.30	0.20	0.15
	>250	25			0.50	0.30	0.20	0.15



☎ 電話 TEL /
+886-4-26265252

☎ 傳真 FAX /
+886-4-26267941

📍 地址 Address /
台灣台中市清水區五權路232號
No. 232, Wuquan Rd., Qingshui Dist., Taichung City 436, Taiwan

🌐 網址 Website /
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