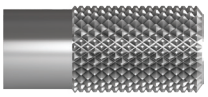
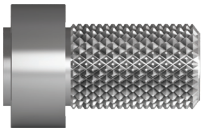
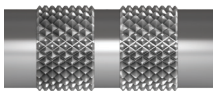
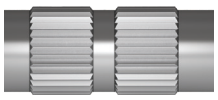
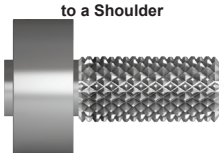
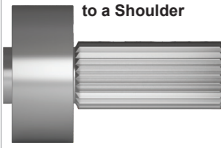
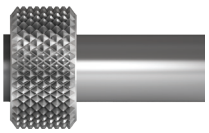
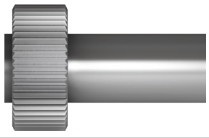
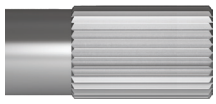
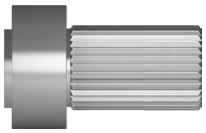
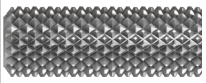
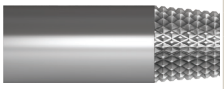
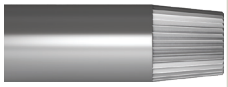
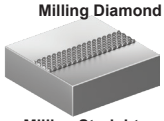
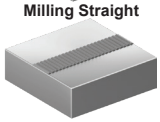
KNURLING TOOLS

From the Knurling Tool Specialists for CNC & Manual Lathes

Knurling Tool Applications Form for Manual & CNC Machines

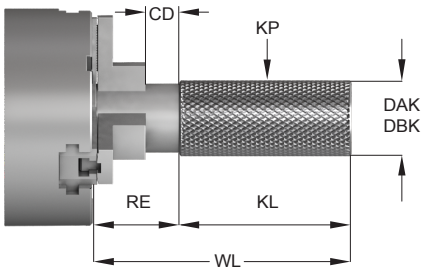
If your knurling application is not in the chart, please supply prints and information.

Knurling Application	Knurling Tool Recommendation		
Diamond Shoulderless 	**BEST**	**BETTER**	**GOOD**
	SCNC-_-1-2 CNC-_-1-2 CNC-_-2-R CNC-_-3-M 3WKT-_-M	SCNC-_-7-D CNC-_-7-R KTM109-_-M KTO109-_-O	SCKN-_-DW-_ 3SHKT-_- CNC-_-4-M
Diamond to a Shoulder 	**BEST**	**BETTER**	**GOOD**
	3WKT-_-2 KTW109-_-4 CNC109-_-4	SSCK-_-DW SCNC-_-6-2 CNC-_-6-4	SFKT
Diamond Band  **Straight Band** 	**BEST**	**BETTER**	**GOOD**
	SCNC-_-7-D- CNC-_-7-R KTM109-_-M KTO109-_-O CNC109-_-M	SCKN-_-DW-_ 3SHKT-_- CNC-_-4-M CNC-_-5-O	FKT-_-_ SWFKT-_-_
Small Diameter Diamond to a Shoulder  **Small Diameter Straight to a Shoulder** 	**BEST**	**BETTER**	**GOOD**
	3WKT-_-2		
Diamond Crest  **Straight Crest** 	**BEST**	**BETTER**	**GOOD**
	SCNC-_-7-D CNC-_-7-R KTM109-_-M KTO109-_-O CNC109-_-M	SCKN-_DW-_ 3SHKT-_- CNC-_-4-M CNC-_-5-O	FKT-_-_ SWFKT-_-_
Radio Face 	**BEST**	**BETTER**	**GOOD**
	Special		

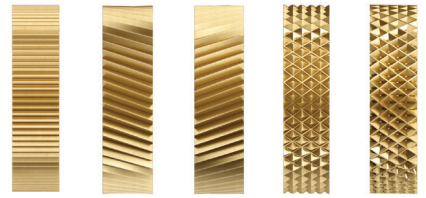
Knurling Application	Knurling Tool Recommendation		
Straight Shoulderless 	**BEST**	**BETTER**	**GOOD**
	SCNC-_7-D CNC-_7-R KTM109-_-M KTO109-_-O 3WKT-_-_ CNC109-_-M	107ST-_ 107ST-_ CNC-_4-M SCKN-_-DW-_ 3SHKT-_- CNC-_5-O	FKT-_-_ SWFKT-_-_
Straight to a Shoulder 	**BEST**	**BETTER**	**GOOD**
	KTW109-_-4 3WKT-_-_ CNC109-_-4	SCNC-_-6-2 CNC-_-6-4 SSCK	SFKT-_-_ SSWFKT
Small Diameter Diamond Shoulderless  **Small Diameter Straight Shoulderless** 	**BEST**	**BETTER**	**GOOD**
	3WKT-_-_	SCNC-_-7-D CNC-_-7-R	
Taper Diamond  **Taper Straight** 	**BEST**	**BETTER**	**GOOD**
	Special		
Internal Diamond  **Internal Straight** 	**BEST**	**BETTER**	**GOOD**
	TIKT-_- SIKT-_-		
Milling Diamond  **Milling Straight** 	**BEST**	**BETTER**	**GOOD**
	MMKT-_-_		

Knurling Tool Applications Form for Manual & CNC Machines

Figure 1 - Full Knurling



Knurl Wheel Identification



Edge Prep

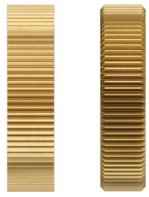
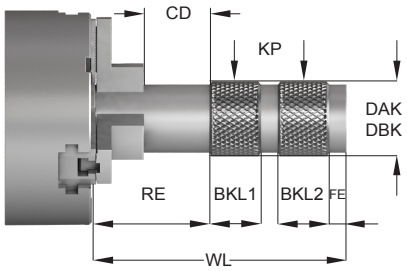


Figure 2 - Band Knurling



Knurl Pitch

TPI Is the number of teeth per inch

Circular Pitch Is the distance between tooth to tooth

Diametral Pitch Is the number of teeth per inch of diameter

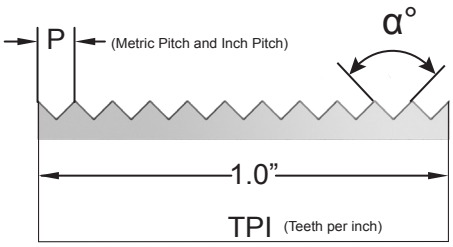


Figure 3 - Shoulder Knurling

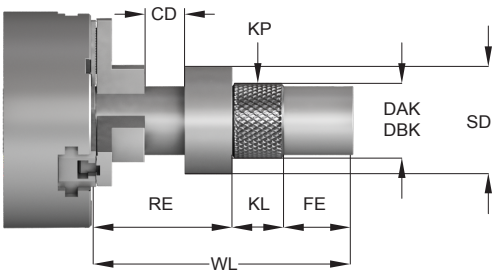
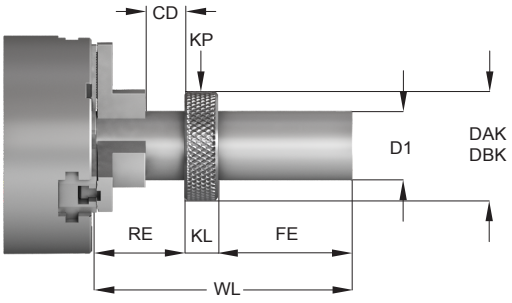


Figure 4 - Crest Knurling



Knurling Specification

Fill out as applicable

SKP Straight Knurl ☐ **DKPM** Diamond Knurl Male ☐

DKPR Diagonal Knurl Right ☐ **DKPF** Diamond Knurl Female ☐

DKPL Diagonal Knurl Left ☐

Fill Knurling Dimension

KP Knurl Pitch ☐ Inch ☐ TPI ☐ DP ☐ Metric ☐ P-mm ☐ **AP** % of Knurl Depth ☐

DBK Diameter (Blank) Before Knurling ☐ **FE** Front End Distance ☐

DAK Diameter After Knurling ☐ **RE** Rear End Distance ☐

KL Knurling Length ☐ **CD** Chuck Distance ☐

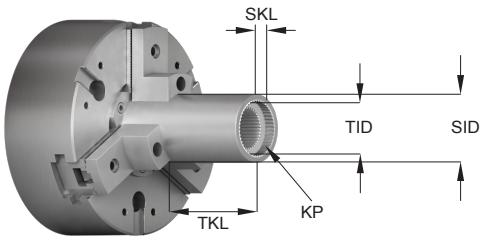
BKL1 Band Knurling Length 1 ☐ **SD** Shoulder Diameter ☐

BKL2 Band Knurling Length 2 ☐ **D1** Shoulder Diameter ☐

WL Workpiece Length ☐

Knurling Tool Applications Form for Manual & CNC Machines

Figure 5 - ID Internal Knurling



Knurling Specification

Fill out as applicable

TID True Internal Diameter ☐

SID Shoulder Internal Diameter ☐

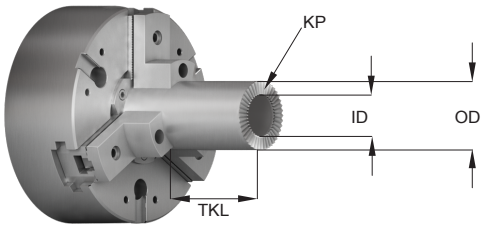
TKL True Knurling Length ☐

SKL Shoulder Knurling Length ☐

KP Knurl Pattern ☐

PI Knurl Pitch Inch TPI ☐ / DP ☐ / Metric P-mm ☐

Figure 6 - Face Knurling



Knurling Specification

Fill out as applicable

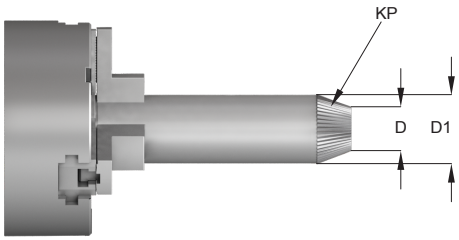
ID Inside Diameter ☐

OD Outside Diameter ☐

KP Knurl Pattern ☐

PI Knurl Pitch Inch TPI ☐ / DP ☐ / Metric P-mm ☐

Figure 7 - Taper Knurling



Knurling Specification

Fill out as applicable

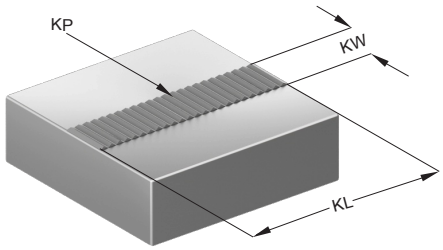
D Small Diameter ☐

D1 Large Diameter ☐

KP Knurl Pattern ☐

PI Knurl Pitch Inch TPI ☐ / DP ☐ / Metric P-mm ☐

Figure 8 - Milling Knurling



Knurling Specification

Fill out as applicable

KW Knurling Width ☐

KL Knurling Length ☐

KP Knurl Pattern ☐

PI Knurl Pitch Inch TPI ☐ / DP ☐ / Metric P-mm ☐

Knurling Production Information

Material _____ Annealed _____ Heat Treated _____

Quantity _____ Hardness _____

Machine Manual ☐ CNC ☐ Swiss ☐ Other ☐

Tool holder Style Left ☐ Right ☐ **Tool holder Size** _____

Knurling Tool Recommendation

Customer Information	**Figure** ☐	**Dorian Tool Recommendation**			
Date		**Item**	**UPC**	**Price**	**Delivery**
Company		Knurling Tool			
Contact		Knurling Head			
E-mail		Knurling Wheel			
Telephone		Knurling Pin			

For Best Knurling Results

1. Diameter of part being knurled should be turned to size and concentric to achieve a good knurling quality.
2. Knurl wheels must be exactly in center line with the work piece for an even knurl pattern.
3. Knurl wheels are to run freely and the knurl pin must be secured on the tool holder (the use of a carbide pin is recommended).
4. Use heavy flow of coolant to keep the knurl wheels cool and clean.
5. There are formulas to calculate depth of cut, tracking pitch and cutting parameter. Because of different material hardness, before starting production follow the instructions and with trial error the best result will be achieved.

Speed and Feeds

For in-feed knurling, the knurl should be fed toward the work gradually until contact is made with the blank. This can be completed within 5 to 25 work revolutions of the working piece.

For end-feed knurling, the feeds used with the turret vary considerably and are dependent on the pitch of the knurl, the material, the diameter of the work blank, and the hardness being knurled.

Knurling is ordinarily performed at the same speeds used as cutting operations. Use the same SFM used for high speed and cobalt tool bits to calculate speeds and feeds. However, where spindle speeds can be reduced without loss of production, it is recommended that spindle speeds be lowered as much as possible to increase knurl life.

For Best Knurling Performance

Before beginning Knurling process check:

- Diameter before knurl
- Diameter after knurl
- Knurl pitch
- Workpiece to be concentric
- Set wheels on center line of workpiece
- Use beveled edge wheels when form knurling
- Use full faced wheels when cut knurling
- Always use coolant when knurling
- The standard knurling depth is 35% of knurl circular pitch.

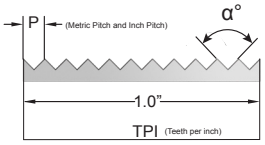
Example: Knurling Depth of 20 TPI Knurl
Circular Pitch of 20TPI is: 1.000/20=.050”
Knurling Depth is: .050” x .035% =.0175” per side

- If the knurl double tracks, the knurl wheel is not deep enough in to workpiece, increase knurling depth
- If the knurl crest rolls over, the knurl wheel is to deep in to the workpiece, decrease knurling depth
- If the knurl is not tracking, the workpiece diameter is not correct for full number of teeth, diameter must adjusted up or down by using a tracking formula.

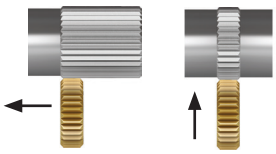
In-Feed Knurling, when the knurl wheel enter into the workpiece radially.
Once the knurl wheel has reached the depth, will take from **5 to 20** revolutions to complete the knurling operation. The revolution changes for the same size with the workpiece material hardness and knurl pitch.
End-Feed Knurling, when the knurl wheel enter into the workpiece axially.
The depth of the knurl wheel must be set before the wheel get in contact with the workpiece, the depth and pressure changes for the same size with the workpiece material hardness and knurl pitch.

Knurling Speeds and Feeds

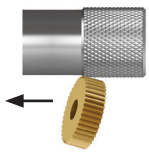
Material and Knurl Pitch



Knurl Forming



Knurl Cutting



Material Description	Material Specs	TPI	Metric Pitch	Forming Speed (SFM and V_c) Smaller ⟨ Wheel dia. ⟩ Larger	Feed rate (f_n) End Feed	Feed rate (f_n) In Feed	Cutting Speed Smaller ⟨ Wheel dia. ⟩ Larger	End Feed
Low carbon steel	1018 1117 1215	>14	>1,8	50-210 SFM [15-63 V_c m/min]	0.006" [0,15mm]	.001-.003" [,025-,075mm]	100-350 SFM [30-106 m/min]	0.009" [,23mm]
		16-20	1,6-1,2		0.008" [0,20mm]	.002-.004" [0,050-,100mm		0.011" [,28mm]
		25-35	1,0-0,7		0.010" [,25mm]	.002-.004" [,050-,100mm]		0.013" [,33mm]
		40>	0,6>		0.012" [,30mm]	.002-.004" [,050-,100mm]		0.015" [,38mm]
Alloy Steel **Tool steels**	4130 4140 D2	>14	>1,8	35-150 SFM [10-45 m/min]	0.004" [,10mm]	.001-.002" [,025-,050mm]	70-250 SFM [21-75 m/min]	0.007" [,18mm]
		16-20	1,6-1,2		0.005" [,13mm]	.001-.003" [,025-,075mm]		0.008" [,20mm]
		25-35	1,0-0,7		0.007" [,18mm]	.001-.003" [,025-,075mm]		0.010" [,25mm]
		40>	0,6>		0.009" [,23mm]	.001-.003" [,025-,075mm]		0.012" [,30mm]
Stainless Steel	304 17-4	>14	>1,8	35-150 SFM [10-45 m/min]	0.004" [,10mm]	.001-.002" [,025-,050mm]	70-250 SFM [21-75 m/min]	0.007" [,18mm]
		16-20	1,6-1,2		0.005" [,13mm]	.001-.003" [,025-,075mm]		0.008" [,20mm]
		25-35	1,0-0,7		0.007" [,18mm]	.001-.003" [,025-,075mm]		0.010" [,25mm]
		40>	0,6>		0.009" [,23mm]	.001-.003" [,025-,075mm]		0.012" [,30mm]
Aluminum **Brass** **Plastic**	6061 C360 Delrin	>14	>1,8	90-390 SFM [27-118 m/min]	0.008" [,20mm]	.002-.004" [,050-,100mm]	110-420 SFM [33-127 m/min]	0.011" [,28mm]
		16-20	1,6-1,2		0.010" [,25mm]	.003-.005" [,075-,125mm]		0.013" [,33mm]
		25-35	1,0-0,7		0.013" [,33mm]	.003-.005" [,075-,125mm]		0.016" [,40mm]
		40>	0,6>		0.017" [,43mm]	.003-.005" [,075-,125mm]		0.020" [,50mm]

Note: When knurling, start with low Cutting speed, to evaluate the wheel performance, (to avoid the premature life of the wheel) increase until optimum cutting speed and feed is achieved

Forming Knurling Versus Cutting Knurl

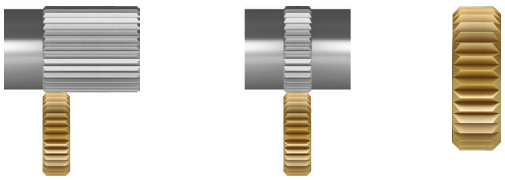
- In Forming Knurl, the knurl wheel's axis is set parallel to the workpiece axis, and forced against workpiece displacing the material to form the knurl pattern
- A large amount of pressure is required to displace the material that forms the knurl pattern, and pressure increases with workpiece diameter, pitch size and hardness
- In a large workpiece diameter, large knurl pitch, and hard material, a multi knurling pass may be required to achieve the correct knurl pattern
- For best performance and quality in Forming Knurl, when possible, a Straddle Knurling Tool is to be used, the pressure is divided within the knurl wheels over the workpiece, and pressure against the spindle of the machine is totally neutralized.
- Use beveled edge wheel when knurl forming to protect the edge from chipping and for smooth knurling surface.
- Use full face Knurled wheel when knurl cutting, the knurl wheels axis are set on negative angle, the sharp edge will cut the knurl pattern into the workpiece
- In cutting knurl, less pressure is required for the operation, higher speed and feed can be used, (use the same cutting date of High Speed or Cobalt turning tools)
- Use full faced knurl wheel when knurl cutting.

Use Forming Knurl Tool for:	Use Cutting Knurl Tool for:
- Small to medium workpiece diameter	- Medium to large workpiece diameter
- To the shoulder knurling	- For shoulderless diameter knurling
- For centerless workpiece	- For hard workpiece materials
- For band knurling application	- For long knurl application with live center
- When high surface finish required	- For higher productivity

Two Ways to Achieve Knurling

(1) Forming

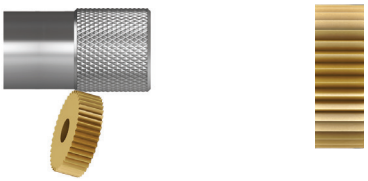
Knurl forming is achieved by pushing the knurl wheels against the blank while rotating. This will cause the material to be displaced in cold form, reproducing the same wheel pattern on the blank circumference.
The blank is increased accordingly to the Knurl Pitch. The force applied through forming is increased in larger diameters making knurling difficult and slow.



Use beveled edge wheel when knurl forming to protect the edge from chipping and for smooth knurl surface.

(2) Cutting

Knurl cutting is achieved by using knurl wheels to actually cut instead of forming the blank. The knurl wheels are set at an angle, making the knurling edges of the knurl wheels cut into the blank. Pressure is minimized while speed and feed are increased.



Use full face Knurled wheel when knurl cutting, the knurl wheels axis are set on negative angle, the sharp edge will cut the knurl pattern into the workpiece

Common Knurling Problems

Problem	Cause	Solution
Knurling double tracking	1) Knurl wheel not deep enough into the workpiece 2) The circumference of the workpiece blank is a not full multiple of the knurl pitch	1) Increase the depth of the knurl wheel into the workpiece 2) Change the blank diameter +/- .005" (.127mm) or use the tracking formula
Knurling flacking or slivered	1) Knurling a workpiece material with scaling or rough surface 2) Over-rolling the knurl wheel into the workpiece when in-feed knurling 3) Knurl Wheel too deep into the workpiece when end-feeding 4) Using 1:1 knurl to workpiece ratio	1) Turn the scaling or the rough surface of workpiece into a smooth surface 2) When in-feed knurling, reduce the depth of the knurl wheel, or reduce the number of revolutions after the knurl wheel has reached knurling depth 3) When end-feeding, reduce the depth of the knurl wheel 4) Use larger or smaller diameter wheel
Knurl destruction	1) Knurling a workpiece material with scaling or rough surface 2) Over-rolling the knurl wheel into the workpiece when in-feed knurling 3) Knurl Wheel too deep into the workpiece 4) Use of sharp full faced knurl wheel when knurl forming	1) Reduce the depth of the knurl wheel 2) Reduce the number of revolutions after the knurl wheel has reached knurling depth 3) Reduce feed and speed and improve coolant flow 4) Use beveled edge when form knurling
Knurl wheel poor life	1) Knurling a workpiece material with scaling or rough surface 2) Over-rolling the knurl wheel into the workpiece when in-feed knurling 3) Knurl Wheel too deep into the workpiece when end-feeding 4) Workpiece material too hard, or difficult to knurl (stainless steels and high temp alloys) 5) Workpiece not running concentric 6) Workpiece too hard 7) Knurl wheel not properly hardened 8) Poor lubrication 9) Not using the correct knurl wheel for the application 10) Knurl wheel not beveled	1) Turn the scaling or the rough surface of workpiece into a smooth surface 2) When in-feed knurling, reduce the depth of the knurl wheel, or reduce the number of revolutions after the knurl wheel has reached knurling depth 3) When end-feeding, reduce the depth of the knurl wheel 4) Reduce feed and speed and improve coolant flow 5) Turn workpiece concentric and into a smooth surface 6) Reduce workpiece speed 7) Change the knurl wheel 8) Improve coolant flow 9) Use beveled knurl wheel(s) when forming knurling; use full faced knurl wheel(s) for cutting knurling 10) Use a beveled knurl wheel
Uneven depth of knurl	1) Knurling a workpiece material with scaling or rough surface 2) Workpiece not running concentric 3) Using 1:1 knurl to workpiece ratio	1) Turn the scaling or the rough surface of workpiece into a smooth surface 2) Turn workpiece concentric and into a smooth surface 3) Use larger or smaller diameter wheel
Twisted knurl pattern	1) Knurl wheel not deep enough into the workpiece 2) The circumference of the workpiece blank is not a full multiple of the knurl pitch	1) Increase the depth of the knurl wheel 2) Change the blank diameter +/- .005" (.127mm) or use the tracking formula
Uneven Knurl Pattern	1) Knurl wheels are not in centerline of the workpiece	1) For a symmetric and even knurl pattern on the workpiece, the knurl wheels must to be set on centerline properly

CNC Modular Knurling Tools
With the
Flexibility of Multiple Knurling Applications!

Versatility

- **Multi** diameter diamond knurling cutting style
- **Reversible** Head for Right or Left knurling.
- **Heavy duty** knurl cutting and knurl forming
- **Double Wheel** forming knurling head
- **Straddle** forming knurling head
- **Shoulder** forming knurling head
- **Wide diameter** range for small diameter to large diameter parts

Modular

Three shank sizes interchangeable with seven knurling heads.

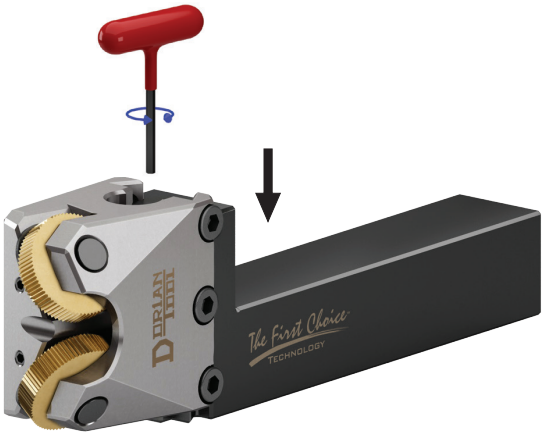
Adjustable

Dovetail knurling head locking system.
Quick and precise center line setting.
Knurling wheel angle stationary for diamond cutting

Two Ways to Knurl

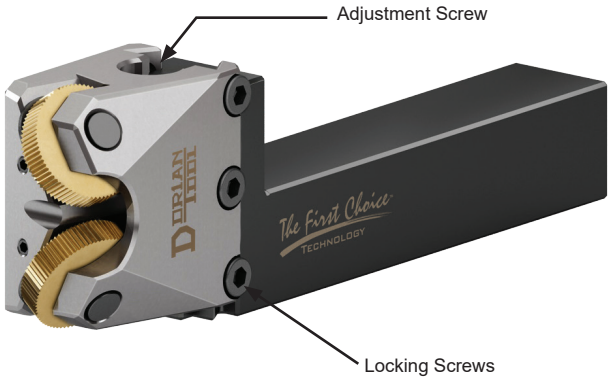
Forming (four heads available)
Knurl forming action (material displacement by means of rolling) is generally for special application. It creates a better quality of knurl pattern, but speeds and feeds are sacrificed for this quality.
The force applied through forming is increased in larger diameters making knurling difficult and slow.

Cutting (three heads available)
Knurl cutting action cuts a perfect knurl pattern 10 to 20 times faster than any conventional knurling tool. It is engineered to knurl any material, including thin wall tubing, with minimum stress to the spindle and work piece.
Knurl cutting action speeds up knurling enough to become applicable for CNC use.



CNC-100-3-M used for examples.

Knurling Tools Cutting Operation



Mounting to the Machine

Clamp the shank at right angles to the axial center line of the machine.
The knurl wheels of the knurling tool head should be set exactly on center.

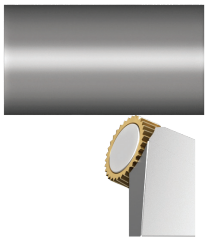
To adjust center-height:

1. Loosen the lock screws.
2. Turning the adjustment screw adjusts the head up or down.
3. Turn adjustment screw until the center height is aligned.
4. Lock head back in place by tightening the lock screws.

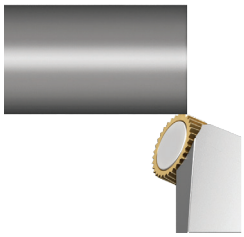
Knurling Adjustment Set Up

With the machine spindle rotating slowly, in-feed (Plunge) the tool to make a slight impression for the full width of the cutter.
This impression should be equal on both wheels when using Diamond Knurling Head. Misaligned patterns can be corrected by turning the fine adjustment screw in opposite directions.

Starting Cutting Knurl



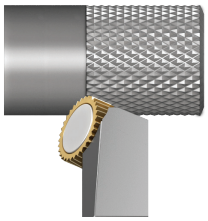
1) Touch the workpiece diameter with the knurl wheels.



2) Move the knurling wheel to the end of the workpiece

Set the cutting depth of the wheel (35% of the circular pitch)

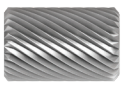
Start knurl



3) Use recommended cutting parameters

Use coolant

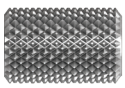
Knurling head center line adjustments


R.H. Spiral

- Knurling tool is too low from center line.
- Top wheel is cutting a deeper R.H. Diagonal Knurl.
- Turn the Fine Center Adjustment Screw until both wheels are on center and touching simultaneously.


L.H. Spiral

- Knurling tool is too high from center line.
- Bottom wheel is cutting a deeper L.H. Diagonal Knurl.
- Turn Fine Center Adjustment Screw until both wheels are on center and touching simultaneously.


Diamond Knurl

- Tool is on center line.
- Both wheels are touching simultaneously, cutting a perfect diamond knurl.

Full Faced Cutting Knurl Wheel

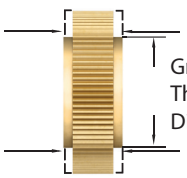
When cut knurling, a full faced knurl wheel must be used. The edge of the knurl wheel will be cut into the material to be knurled. A sharp edge must be kept to cut a clean and smooth knurl pattern. The knurl wheel can be reground once the edge is dull or chipped.

Edge Prep

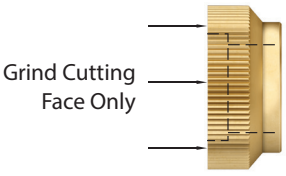
Full Faced

Wheel Grinding

When the cutting edges of the knurl wheel become dull, resharpen them by grinding the cutting face of both wheels evenly. You can also grind forming wheels to desired width, but bevel afterwards.



R & M SERIES KNURL WHEEL



SW SERIES KNURL WHEEL

Easy to set up
Simple to operate.

To minimize set up time of knurling application, and simplify the knurling operation, the CNC Modular Knurling Tool has been engineered to create a diamond knurling pattern, without the need of reseting the knurl wheels every time the workpiece diameter changes.

To cover the full range of diameter three modular cutting knurling head have been developed.

1) Small diameter modular head
2) Medium diameter modular head
3) Large diameter modular head

Small Diameter Head

Cutting Range

Small Diameter Cutting Range from 1/2” to 1-1/2”
End feed range: .004” to .012”

• Knurl cutting action

• Twin straight SW series knurl wheels for male diamond pattern

• Supplied with Full Faced SW2S-30-HS knurl wheels - TiN coated

Medium Diameter Head

Medium Diameter Cutting Range from 1” to 5”
End feed range: .004” to .016”

• Knurl cutting action

• Two straight R series knurl wheels for male diamond pattern

• Supplied with Full Faced RS-25-HS knurl wheels - TiN coated

Large Diameter Head

Large Diameter Cutting Range from 2” & up
End feed range: .004” to .025”

• Knurl cutting action

• Two straight M series knurl wheels for male diamond pattern

• Supplied with Full Faced MS-25-HS knurl wheels - TiN coated

How the diamond CNC Modular Knurling tool works.
1) Choose the cutting diameter range of the knurl head
2) Set the knurling wheel on centerline of the workpiece
3) Touch the workpiece diameter with the knurl wheels.
4) Set the depth of cut (35% of the circle pitch)
6) Start to cut according to recommended cutting parameters

3 Modular Shank Sizes

7 Modular Heads

- **Flexibility**
- **Multiple combinations**
- **Multiple applications**
- **Better performance**
- **Designed for the CNC Lathe**
- **Precision square shank with preset center height**
- **Right or Left hand applications**
- **Interchangeable shanks & heads**
- **High Speed knurl wheels (TiN coated)**
- **Supplied with heavy duty parts**

1 Light Duty 60º Diamond Cutting Modular Knurling Head - CNCKH-1-2

Small Diameter Cutting Range 1/2" to 1-1/2"

End feed range: .004" to .012"
- Knurl cutting action
- Twin straight SW series knurl wheels for male diamond pattern
- Supplied with Full Faced SW2S-30-HS knurl wheels - TiN coated

2 Heavy Duty 60º Diamond Cutting Modular Knurling Head - CNCKH-2-R

Medium Diameter Cutting Range 1" to 5"

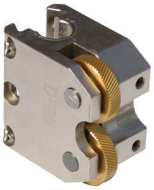
End feed range: .004" to .016"
- Knurl cutting action
- Two straight R series knurl wheels for male diamond pattern
- Supplied with Full Faced RS-25-HS knurl wheels - TiN coated

3 Extra Heavy Duty 60º Diamond Cutting Modular Knurling Head - CNCKH-3-M

Large Diameter Cutting Range 2" & up

End feed range: .004" to .025"
- Knurl cutting action
- Two straight M series knurl wheels for male diamond pattern
- Supplied with Full Faced MS-25-HS knurl wheels - TiN coated

4 Double Wheel Forming Knurling Modular Head - CNCKH-4-M



Diameter Range 5/16" & up

End feed range: .004" to .012"
- Knurl Forming action
- Two M series knurl wheels for straight or diamond pattern
- Supplied with Beveled MDR/L-25-HSB knurl wheels - TiN coated

5 Single Wheel Forming Modular Knurling Head - CNCKH-5-O

Straight Bump Unlimited Diameter

End feed range: .004" to .012"
- Knurl forming action
- Single O series knurl wheel for straight or diamond pattern
- Supplied with Beveled OS-25-HSB knurl wheel - TiN coated

6 Shoulder Forming Modular Knurling Head - CNCKH-6-4

Diameter Range 5/16" & up

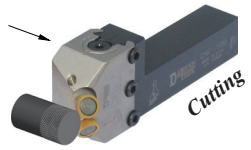
End feed range: .004" to .012"
- Knurl forming action
- Two SW series knurl wheels for straight or diamond pattern
- Supplied with Beveled SW4R/L-25-HSB knurl wheels - TiN coated

7 Straddle Forming Modular Knurling Head - CNCKH-7-R

Diameter Range up to 1"

End feed range: .004" to .012"
- Knurl forming action
- Two R series knurl wheels for straight or diamond pattern
- Supplied with Beveled RDR/L-30-HSB knurl wheels - TiN coated

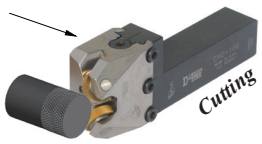
1 Light Duty 60º Diamond Cutting Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-1-2	20410	.750"	6 7/8"				
CNC-100-1-2	20420	1.000"	6 7/8"	Series SW2	SW2.0P-2S	29055	CNCKH-1-2
CNC-125-1-2	20430	1.250	7 3/8"				

Supplied with a set of Full Faced straight high speed TiN coated knurl wheels, 30 TPI (.8mm) for a male diamond pattern.

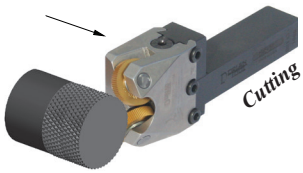
2 Heavy Duty 60º Diamond Cutting Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-2-R	20510	.750"	6 7/8"				
CNC-100-2-R	20520	1.000"	6 7/8"	Series R	KPS-25- 87-C	28925	CNCKH-2-R
CNC-125-2-R	20530	1.250	7 3/8"				

Supplied with a set of Full Faced straight high speed knurl wheels, 25 TPI (1mm) for a male diamond pattern.

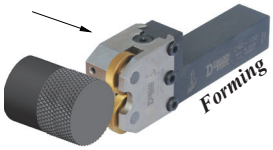
3 Extra Heavy Duty 60º Diamond Cutting Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-3-M	20610	.750"	7"				
CNC-100-3-M	20620	1.000"	7"	Series M	KPS-31-100-C	28945	CNCKH-3-M
CNC-125-3-M	20630	1.250	7 1/2"				

Supplied with a set of Full Faced straight high speed TiN coated knurl wheels, 25 TPI (1mm) for a male diamond pattern

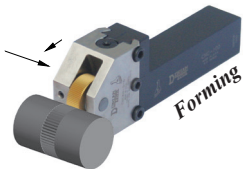
4 Double Wheel Forming Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-4-M	20646	.750"	7"				
CNC-100-4-M	20648	1.000"	7"	Series M	KPS-31-125-C	28950	CNCKH-4-M
CNC-125-4-M	20650	1.250	7 1/2"				

Supplied with a set of Beveled diagonal high speed beveled TiN coated knurl wheels, 25 TPI (1mm) for a male diamond pattern.

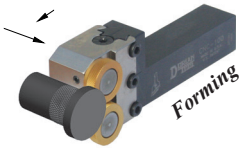
5 Single Wheel Forming Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-5-O	20710	.750"	6 3/4"				
CNC-100-5-O	20720	1.000"	6 3/4"	Series O	KPS-31-125-C	28950	CNCKH-5-O
CNC-125-5-O	20730	1.250	7 1/4"				

Supplied with one Beveled straight high speed beveled TiN coated knurl wheel, 25 TPI (1mm) for a straight pattern

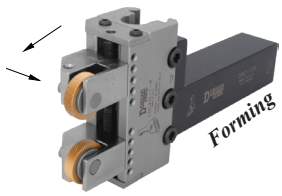
6 Shoulder Forming Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-6-4	20780	.750"	6 3/4"				
CNC-100-6-4	20790	1.000"	6 3/4"	Series SW4	SW4.0P-2S	29085	CNCKH-6-4
CNC-125-6-4	20800	1.250	7 1/4"				

Supplied with a set of Beveled diagonal high speed beveled TiN coated knurl wheels, 25 TPI (1mm) for a male diamond pattern.

7-R Straddle Forming Modular Knurling Head + CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head
CNC-75-7-R	20910	.750"	7 3/8"				
CNC-100-7-R	20920	1.000"	7 3/8"	Series R	KPS-25-75-C	28915	CNCKH-7-R
CNC-125-7-R	20930	1.250	7 7/8"				

Supplied with a set of Beveled diagonal high speed beveled TiN coated knurl wheels, 30 TPI (.8mm) for a male diamond pattern.

1 SMALL Light Duty 60º Diamond Cutting Modular Knurling Head - SCNCKH-1-2

Small Cutting Range 1/2” to 1-1/2”

End feed range: .004” to .012”

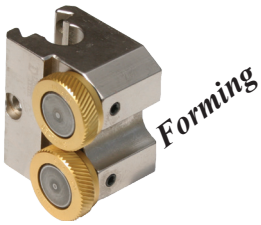
- Knurl cutting action
- Twin straight SW series knurl wheels for male diamond pattern
- Supplied with full faced SW2S-30-HS knurl wheels - TiN coated

3 Modular Shank Sizes

3 Modular Heads

- **Flexibility**
- **Multiple combinations**
- **Multiple applications**
- **Better performance**
- **Designed for the CNC Lathe**
- **Precision square shank with preset center height**
- **Right or Left hand applications**
- **Interchangeable shanks & heads**
- **High Speed knurl wheels (TiN coated)**
- **Supplied with heavy duty parts**

6 SMALL Shoulder Forming Modular Knurling Head - SCNCKH-6-2

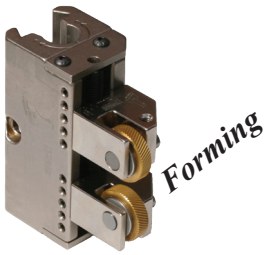


Diameter Range 1/4” & up

End feed range: .004” to .012”

- Knurl forming action
- Twin SW series knurl wheels for straight or diamond pattern
- Supplied with beveled SW2R/L-25-HSB knurl wheels - TiN coated

7-R SMALL Straddle Forming Modular Knurling Head - SCNCKH-7-D

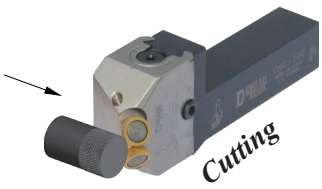


Diameter Range up to 5/8”

End feed range: .004” to .012”

- Knurl forming action
- Twin D series knurl wheels for straight or diamond pattern
- Supplied with beveled DR/L-30-HSB knurl wheels - TiN coated

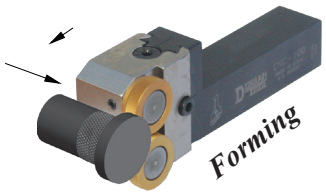
1 SMALL Light Duty 60º Diamond Cutting Modular Knurling Head + SMALL CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head Description
SCNC-37-1-2	20010	3/8"	4"				
SCNC-50-1-2	20020	1/2"	4-1/4"	Series SW2	SW2.0P-2S	29055	SCNCKH-1-2
SCNC-162-1-2	20025	5/8"	4-1/4"				

Supplied with a set of Full Faced straight high speed TiN coated knurl wheels, 30 TPI (.8mm) for a male diamond pattern

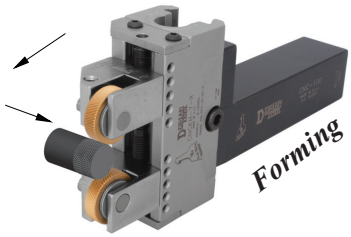
6 SMALL Shoulder Forming Modular Knurling Head + SMALL CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head Description
SCNC-37-6-2	20110	3/8"	4"				
SCNC-50-6-2	20120	1/2"	4-1/4"	Series SW4	SW2.0P-2S	29055	SCNCKH-6-2
SCNC-162-6-2	20125	5/8"	4-1/4"				

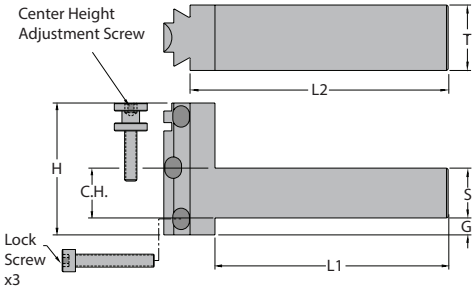
Supplied with a set of Beveled diagonal high speed TiN coated knurl wheels, 25 TPI (1mm) for a male diamond pattern

7-R SMALL Straddle Forming Modular Knurling Head + SMALL CNC Modular Knurling Tool Shank



Description	UPC #	Shank Size	Tool Length	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Modular Head Description
SCNC-37-7-D	20210	3/8"	4-1/2"				
SCNC-50-7-D	20220	1/2"	4-3/4"	Series D	KPS-18-50-C	28905	SCNCKH-7-D
SCNC-162-7-D	20225	5/8"	4-3/4"				

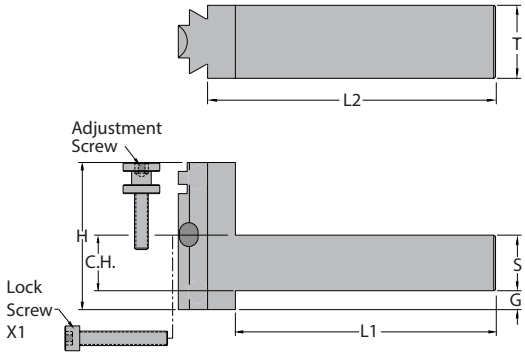
Supplied with a set of Beveled diagonal high speed TiN coated knurl wheels, 30 TPI (8mm) for a male diamond pattern



CNC Modular Knurling Tool Shank

Description	UPC #	C.H. & S	G	H	L1	L2	T	Adjustment Screw Description	Adjustment Screw UPC #	Lock Screw Set of 3 Description	Lock Screw Set of 3 UPC #
CNC-75*	21010	0.750"	0.250	2.000	4.500	4.875	1.000				
CNC-100*	21020	1.000"	0.000	2.000	4.500	4.875	1.000	CNC-1175	28505	CNC-1024**	28515
CNC-125*	21030	1.250"	0.000	2.250	5.000	5.375	1.000				

* Supplied with lock screw set and adjustment screw
** One (1) set includes three (3) lock screws



- Easy set-up
- High productivity
- Best knurl quality
- Long knurl wheel life
- Low production cost
- Specifically designed for the CNC Lathe
- Precision square shank with preset center height
- Right or Left hand applications
- Shanks and heads are all interchangeable
- High Speed knurl wheels (TiN coated)
- Carbide knurl pin
- Center height adjustment

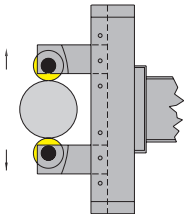
CNC Small Modular Knurling Tool Shank

Description	UPC #	C.H. & S	G	H	L1	L2	T	Adjustment Screw Description	Adjustment Screw UPC #	Lock Screw Description	Lock Screw UPC #
SCNC-37*	20310	0.375"	0.115	1.000	2.500	2.685	0.750				
SCNC-50*	20320	0.500"	0.000	1.000	2.750	2.935	0.750	SCNC-875	28510	SCNC-832	28520
SCNC-162*	20325	0.625"	0.000	1.125	2.750	2.935	0.750				

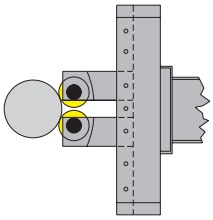
* Modular shank supplied with adjustment screw and screw lock

Straddle Style Forming Knurling Tools A diametral adjustment screw regulates the depth of the knurl pattern and the diameter size. The floating head will allow the knurl wheel to self adjust on the work piece - even when the work piece is not perfectly concentric. The tool can be used for twin wheel applications or single wheel knurling applications. This tool comes with a square shank to be used on open slot tool holders, or on a turret, with a preset center height adjustment which will meet the fixed center height of the CNC and the turret lathe. Body and shank are made of heat-treated, precision ground alloy steel. The dovetail guide ensures the most precise accuracy and rigidity for infinite diameter settings.

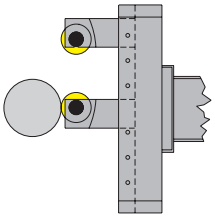
Heavy Duty Style Forming Knurling Tool



Straddle application is best when pressure and deflection are a problem. The knurling arms are able to "float" somewhat and center on the workpiece, compensating for any off-centering. It has been developed to make a perfect knurling pattern without putting any pressure on the spindle or on the lathe compound.



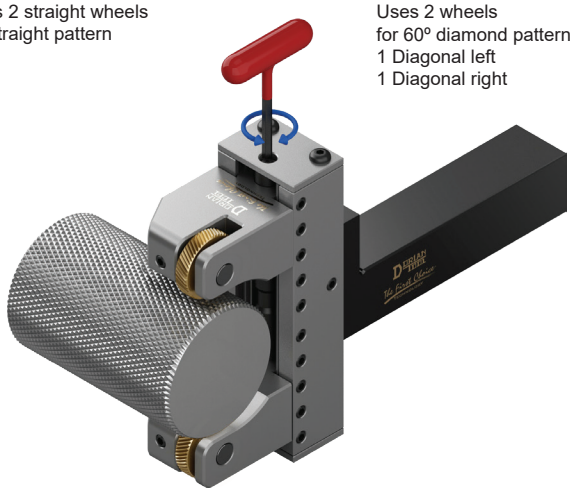
Bump application is best for narrow knurling applications. The knurling arms are moved closer together so that the tool can "bump" against the side of the working part with two wheels touching the part.



Single wheel application is best for narrow and quick knurling setup. The knurling arms are moved up so that the bottom knurling wheel is locked on center and can "bump" against the side of the working part. With one wheel touching the part, this configuration allows for a quicker setup and knurling of narrow knurling applications.

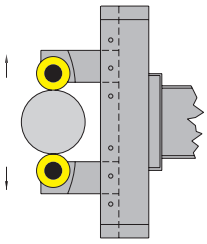
Uses 2 straight wheels for straight pattern

Uses 2 wheels for 60º diamond pattern
1 Diagonal left
1 Diagonal right



Knurl wheels are supported in a flanged nest to offer best rigidity to handle heavy duty knurling. The knurl wheels are mounted between thrust washers to insure a smooth and even rotation while knurling is performed.

Shoulder Style Forming Knurling Tool

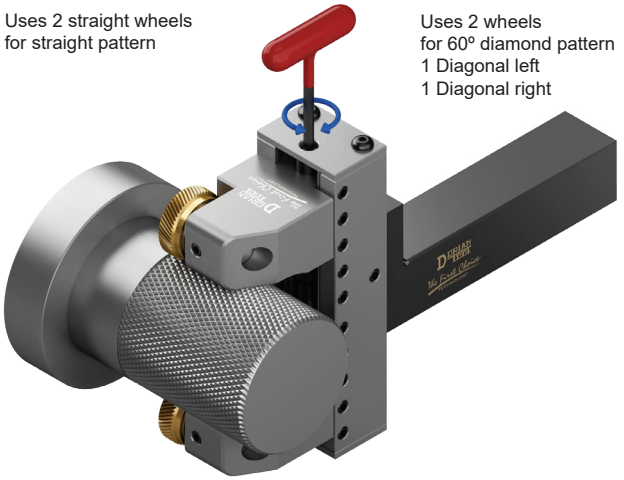


Straddle application is best when pressure and deflection are a problem. The knurling arms are able to "float" somewhat and center on the workpiece, compensating for any off-centering. It has been developed to make a perfect knurling pattern without putting any pressure on the spindle or on the lathe compound.

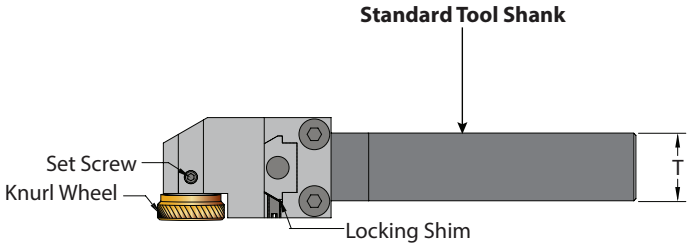
Designed to knurl against a square shoulder. The knurl wheels are mounted on a thrust washer to insure a smooth and even rotation while knurling is performed. The wheels are held at slight pitch to the work part for better end feeding (feeding across the part towards the chuck).

Uses 2 straight wheels for straight pattern

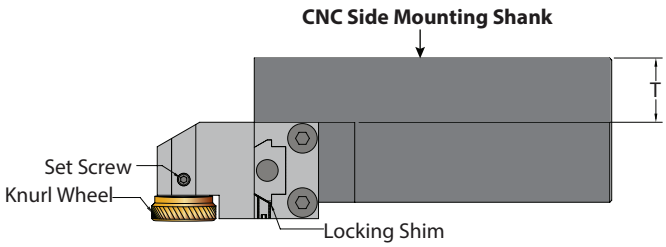
Uses 2 wheels for 60º diamond pattern
1 Diagonal left
1 Diagonal right



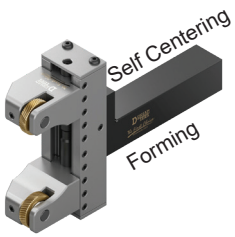
Knurling Tool Shank Mounting



For Standard to Mounting



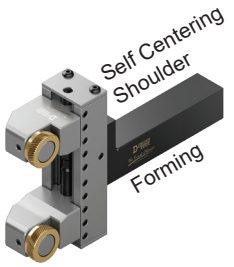
For restricted indexing clearance of the CNC Turret



KTM109 Heavy Duty Style Straddle Square Shank Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
KTM109-75-15-M	22814	0 - 1.50" ***	M*	W109-3-25-M	W109-3-25-4	0.750
KTM109-100-15-M	22816		M*	W109-3-25-M	W109-3-25-4	1.000
KTM109-125-15-M	22818		M*	W109-3-25-M	W109-3-25-4	1.250
KTM109-75-25-M	22823	.125 - 2.50" ***	M*	W109-3-25-M	W109-3-25-4	0.750
KTM109-100-25-M	22824		M*	W109-3-25-M	W109-3-25-4	1.000
KTM109-125-25-M	22826		M*	W109-3-25-M	W109-3-25-4	1.250

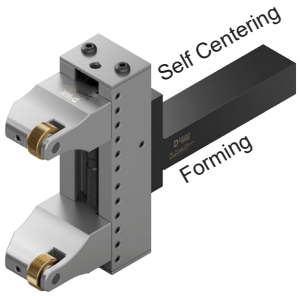
* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels for a male diamond pattern, 25 TPI
***Warning: This tool has the capability to adjust the wheels until they touch, but physically applying a knurl on small diameters may not be possible



KTW109 Shoulder Style Straddle Square Shank Forming Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
KTW109-75-15-4	22832	0 - 1.50" **	SW4*	W109-3-25-4	W109-3-25-M	0.750
KTW109-100-15-4	22833		SW4*	W109-3-25-4	W109-3-25-M	1.000
KTW109-125-15-4	22834		SW4*	W109-3-25-4	W109-3-25-M	1.250
KTW109-75-25-4	22841	125 - 2.50" ***	SW4*	W109-3-25-M	W109-3-25-4	0.750
KTW109-100-25-4	22842		SW4*	W109-3-25-M	W109-3-25-4	1.000
KTW109-125-25-4	22843		SW4*	W109-3-25-M	W109-3-25-4	1.250

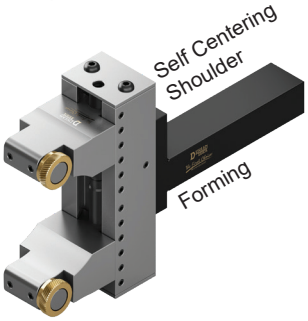
* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels for a male diamond pattern, 25 TPI
***Warning: This tool has the capability to adjust the wheels until they touch, but physically applying a knurl on small diameters may not be possible



KTO109-40 Heavy Duty Style Straddle Square Shank Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
KTO109-100-40-O	22869	.63 - 4.00"***	O*	W109-3-40-O	W109-3-40-4	1.000
KTO109-125-40-O	22870		O*	W109-3-40-O	W109-3-40-4	1.250

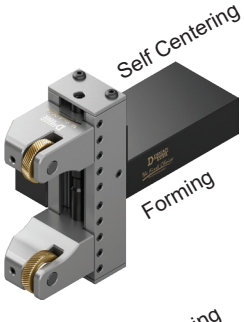
* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels for a male diamond pattern, 25 TPI
***Warning: Physically applying a knurl on small diameters may not be possible



KTW109-40 Shoulder Style Straddle Square Shank Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
KTW109-100-40-4	22873	.63 - 4.00"***	SW4*	W109-3-40-4	W109-3-40-O	1.000
KTW109-125-40-4	22874		SW4*	W109-3-40-4	W109-3-40-O	1.250

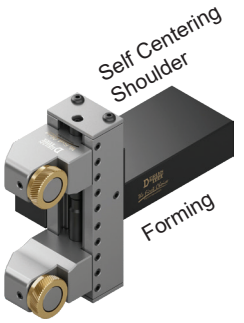
* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels for a male diamond pattern, 25 TPI
***Warning: Physically applying a knurl on small diameters may not be possible



CNC109-M Side Mount Flange Style Square Shank Knurling Tool

Description	UPC #		Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
CNC109-75-15-M-R/L	21449	21452	0 - 1.50" ***	M*	W109-3-25-M	W109-3-25-4	0.750
CNC109-100-15-M-R/L	21450	21453		M*	W109-3-25-M	W109-3-25-4	1.000
CNC109-125-15-M-R/L	21451	21454		M*	W109-3-25-M	W109-3-25-4	1.250
CNC109-75-25-M-R/L	21461	21464	.125 - 2.50" ***	M*	W109-3-25-M	W109-3-25-4	0.750
CNC109-100-25-M-R/L	21462	21465		M*	W109-3-25-M	W109-3-25-4	1.000
CNC109-125-25-M-R/L	21463	21466		M*	W109-3-25-M	W109-3-25-4	1.250

* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels, 25 TPI
*** Warning: This tool has the capability to adjust the wheels until they touch, but physically applying a knurl on small diameters may not be possible



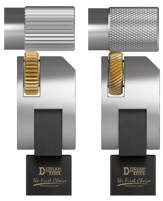
CNC109-4 Side Mount Shoulder Style Square Shank Knurling Tool

Description	UPC #		Diameter Range***	Knurl Wheel	Knurl Arm Set Supplied	Knurl Arm Set Optional	Shank Size
CNC109-75-15-4-R/L	21473	21476	0 - 1.50" ***	SW4*	W109-3-25-4	W109-3-25-M	0.750
CNC109-100-15-4-R/L	21474	21477		SW4*	W109-3-25-4	W109-3-25-M	1.000
CNC109-125-15-4-R/L	21475	21478		SW4*	W109-3-25-4	W109-3-25-M	1.250
CNC109-75-25-4-R/L	21485	21488	.125 - 2.50" ***	SW4*	W109-3-25-4	W109-3-25-M	0.750
CNC109-100-25-4-R/L	21486	21489		SW4*	W109-3-25-4	W109-3-25-M	1.000
CNC109-125-25-4-R/L	21487	21490		SW4*	W109-3-25-4	W109-3-25-M	1.250

* Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels, 25 TPI
*** Warning: This tool has the capability to adjust the wheels until they touch, but physically applying a knurl on small diameters may not be possible

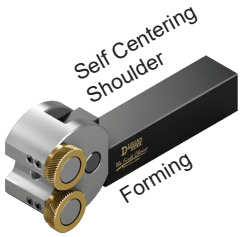
SCKN - Self-Centering Knurling Tool HDSCKN Heavy Duty Self-Centering Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SCKN-38-DW-D	22151	1/4" & up***	D *	KPS-18-50	28805	0.375
SCKN-50-DW-D	22111		D *	KPS-18-50	28805	0.500
SCKN-162-DW-D	22115		D *	KPS-18-50	28805	0.625
SCKN-75-DW-M	22121	5/16" & up***	M **	KPS-31-100	28845	0.750
SCKN-100-DW-M	22131		M **	KPS-31-100	28845	1.000
SCKN-125-DW-M	22141		M **	KPS-31-100	28845	1.250
HDSCK-75-DW-O	22410	3/4" & up***	O **	KPS-31-125-C	28950	0.750
HDSCK-100-DW-O	22420		O **	KPS-31-125-C	28950	1.000
HDSCK-100-DW-P	22430	1.0" & up ***	P **	KPS-50-125-C	28955	1.000
HDSCK-125-DW-P	22440		P **	KPS-50-125-C	28955	1.250

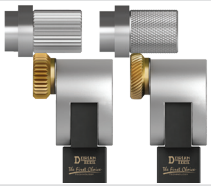


Supplied with one (1) set of beveled diagonal high speed knurl wheels, *30 TPI, **25 TPI
*** Warning: May cause deflections on small part diameters, and too much pressure on large diameters

SSCK - Shoulder Self-Centering Knurling Tool *Reversible Direction*



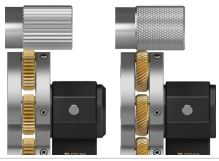
Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SSCK-38-DW-2	22210	1/4" & up***	SW2 *	SW2.0P-2S	29055	0.375
SSCK-50-DW-2	22220		SW2 *	SW2.0P-2S	29055	0.500
SSCK-162-DW-2	22218		SW2 *	SW2.0P-2S	29055	0.625
SSCK-75-DW-4	22240	5/16" & up***	SW4 **	SW4.0P-2S	29085	0.750
SSCK-100-DW-4	22250		SW4 **	SW4.0P-2S	29085	1.000
SSCK-125-DW-4	22260		SW4 **	SW4.0P-2S	29085	1.250



Supplied with one (1) set of beveled diagonal high speed TiN coated knurl wheels, *30 TPI, **25 TPI
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

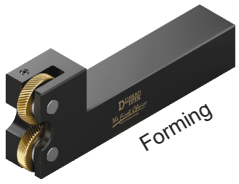
3SHKT - Three Swivel Head Knurling Tool *Reversible Direction*

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
3SHKT-50-D	21510	1/4 "& up***	D *	KPS-18-62	28810	0.500
3SHKT-162-D	21515		D *	KPS-18-62	28810	0.625
3SHKT-75-M	21530	5/16" & up ***	M **	KPS-31-100	28845	0.750
3SHKT-100-M	21540		M **	KPS-31-100	28845	1.000
3SHKT-125-M	21550		M **	KPS-31-100	28845	1.250



* Supplied with three (3) sets of beveled diagonal right and diagonal left high speed TiN coated knurl wheels, 20 TPI, 30 TPI, 40 TPI
** Supplied with three (3) sets of beveled diagonal right and diagonal left high speed TiN coated knurl wheels, 16 TPI, 25 TPI, 35 TPI.
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

FKT - Fixed Forming Knurling Tool

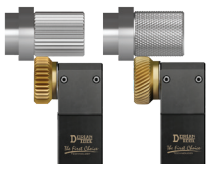


Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
FKT-38-D	21910	1/4" & up***	D *	KPS-18-50	28805	0.375
FKT-50-D	21920		D *	KPS-18-50	28805	0.500
FKT-162-D	21955		D *	KPS-18-62	28810	0.625
FKT-75-M	21930	5/16" & up***	M **	KPS-31-75	28840	0.750
FKT-100-M	21940		M **	KPS-31-100	28845	1.000
FKT-125-O	21950		O **	KPS-31-125	28850	1.250

Supplied with one (1) set of diagonal high speed beveled TiN coated knurl wheels, *30 TPI, ** 25 TPI
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

SFKT - Shoulder Fixed Forming Knurling Tool

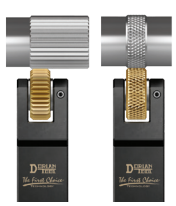
Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SFKT-38-2	22010	1/4" & up***	SW2 *	SW2.0P-2S	29055	0.375
SFKT-50-2	22020		SW2 *	SW2.0P-2S	29055	0.500
SFKT-162-2	22055		SW2 *	SW2.0P-2S	29055	0.625
SFKT-75-4	22030	5/16" & up***	SW4 **	SW4.0P-2S	29085	0.750
SFKT-100-4	22040		SW4 **	SW4.0P-2S	29085	1.000
SFKT-125-4	22050		SW4 **	SW4.0P-2S	29085	1.250



Suppled with one (1) set of beveled diagonal high speed TiN coated knurl wheels, * 30 TPI (0.8mm), ** 25 TPI (1.0mm)
*** Warning: May cause deflections on small part diameters, and too much pressure on large diameters

SWFKT - Single Wheel Fixed Forming Knurling Tool
HDSWFKT - Heavy Duty Single Wheel Fixed Forming Knurling Tool

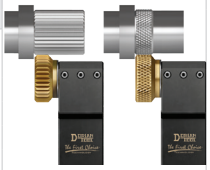
Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SWFKT-831-B	21705	Unlimited***	B *	KPS-12-38	28800	0.312
SWFKT-38-D	21720		D *	KPS-18-50	28805	0.375
SWFKT-50-D	21730		D *	KPS-18-50	28805	0.500
SWFKT-162-D	21765		D *	KPS-18-62	28810	0.625
SWFKT-75-M	21740		M **	KPS-31-75	28840	0.750
SWFKT-100-O	21750		O **	KPS-31-100	28845	1.000
SWFKT-125-O	21760		O **	KPS-31-125	28850	1.250
HDSWFKT-75-O	21810		O **	KPS-31-100-C	28945	0.750
HDSWFKT-100-P	21820		P **	KPS-50-125-C	28955	1.000
HDSWFKT-125-P	21830		P **	KPS-50-125-C	28955	1.250



Supplied with one (1) straight high speed beveled TiN coated knurl wheel, *30 TPI, **25 TPI
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

SSWFKT - Single Shoulder Wheel Fixed Forming Knurling Tool

Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SSWFKT-38-2	21777	Unlimited***	SW2 *	SW2.0P-1S	29050	0.375
SSWFKT-50-2	21781		SW2 *	SW2.0P-1S	29050	0.500
SSWFKT-162-2	21783		SW2 *	SW2.0P-1S	29050	0.625
SSWFKT-75-4	21789		SW4 **	SW4.0P-1S	29080	0.750
SSWFKT-100-4	21793		SW4 **	SW4.0P-1S	29080	1.000
SSWFKT-125-4	21797		SW4 **	SW4.0P-1S	29080	1.250



Suppled with one (1) beveled straight high speed TiN coated knurl wheel, * 30 TPI (0.8mm), ** 25 TPI (1.00mm)
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

107ST - Straight Cutting Knurling Tool With A Square Shank For CNC

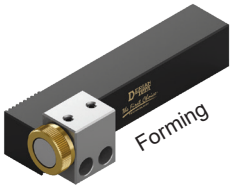
Description	UPC # R.H.	UPC # LH.	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
107ST-50-R-RH/LH	21110	21210	Unlimited***	RDL*	KPS-25-100-C	28930	0.500
107ST-162-R-RH/LH	21115	21215		RDL*	KPS-25-100-C	28930	0.625
107ST-75-M-RH/LH	21130	21230		MDL**	KPS-31-125-C	28950	0.750
107ST-100-M-RH/LH	21140	21240		MDL**	KPS-31-125-C	28950	1.000
107ST-125-M-RH/LH	21150	21250		MDL**	KPS-31-125-C	28950	1.250

Supplied with one (1) full faced diagonal left high speed TiN coated knurl wheel, * 30 TPI, ** 25 TPI
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters

107ST - Straight Cutting Shoulder Knurling Tool With A Square Shank For CNC

Description	UPC # R.H.	UPC # LH.	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
107ST-50-2-RH/LH	21111	21211	Unlimited***	SW2L*	SW2.0P-1S	29050	0.500
107ST-162-2-RH/LH	21116	21216		SW2L*	SW2.0P-1S	29050	0.625
107ST-75-4-RH/LH	21131	21231		SW4L**	SW4.0P-1S	29080	0.750
107ST-100-4-RH/LH	21141	21241		SW4L**	SW4.0P-1S	29080	1.000
107ST-125-4-RH/LH	21151	21251		SW4L**	SW4.0P-1S	29080	1.250

Supplied with one (1) full faced diagonal left high speed TiN coated knurl wheel, * 30 TPI (.8mm), ** 25 TPI (1.0mm)
*** Warning: May cause deflection on small part diameters, and too much pressure on large diameters



FACEKT - Face Forming Knurling Tool

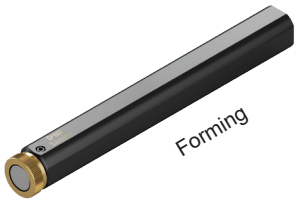
Description	UPC #	Diameter Range***	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
FACEKT-75-2	21620	Unlimited***	SW2 *	SW2.0P-1S	29050	0.750
FACEKT-100-2	21630		SW2 *	SW2.0P-1S	29050	1.000
FACEKT-75-4	21640		SW4 **	SW4.0P-1S	29080	0.750
FACEKT-100-4	21650		SW4 **	SW4.0P-1S	29080	1.000

Supplied with one (1) beveled straight high speed TiN coated knurl wheel, * 30 TPI (.8mm), ** 25 TPI (1.0mm)
*** Limited band width from knurl wheel

TIKT - True Internal Forming Knurling Tool

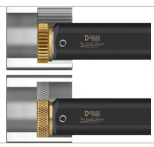
Description	UPC #	Min. Diameter	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
TIKT-50-B	22611	0.562”	B *	KPS-12-38	28800	0.500
TIKT-75-D	22621	1.000”	D *	KPS-18-50	28805	0.750
TIKT-100-R	22631	1.190”	R **	KPS-25-75	28820	1.000
TIKT-125-M	22641	1.500”	M **	KPS-31-100	28845	1.250

Supplied with one (1) set of beveled diagonal high speed knurl wheels, *30 TPI, **25 TPI
*** Warning: May cause deflections on small part diameters, and too much pressure on large diameters



SIKT - Shoulder Internal Forming Knurling Tool

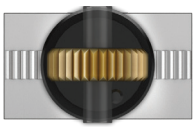
Description	UPC #	Min. Diameter	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
SIKT-50-2	22610	0.562”	SW2 *	SW2.0P-1S	29050	0.500
SIKT-75-4	22620	1.125”	SW4 **	SW4.0P-1S	29080	0.750
SIKT-100-4	22630	1.125”	SW4 **	SW4.0P-1S	29080	1.000
SIKT-125-4	22640	1.375”	SW4 **	SW4.0P-1S	29080	1.250



Supplied with one (1) beveled straight high speed TiN coated knurl wheel, * 30 TPI, ** 25 TPI.

MMKT - Milling Machine Forming Knurling Tool

Description	UPC #	Knurl Wheel	Knurl Pin Set Description	Knurl Pin Set UPC #	Shank Size
MMKT-38-D	22510	D *	KPS-18-62	28810	0.375
MMKT-50-R	22520	R **	KPS-25-87	28825	0.500
MMKT-75-O	22530	O **	KPS-31-100	28845	0.750
MMKT-100-O	22540	O **	KPS-31-125	28850	1.000
MMKT-125-P	22550	P **	KPS-50-150	28860	1.250

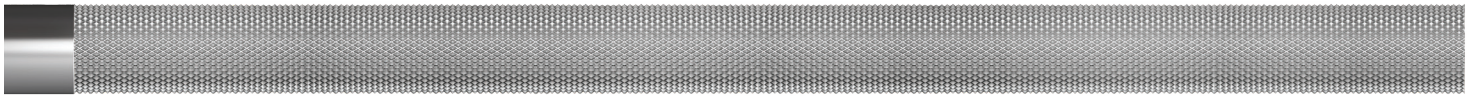


Supplied with one (1) beveled straight high speed TiN coated knurl wheel, *30 TPI (0.8mm), **25 TPI (1.0mm)

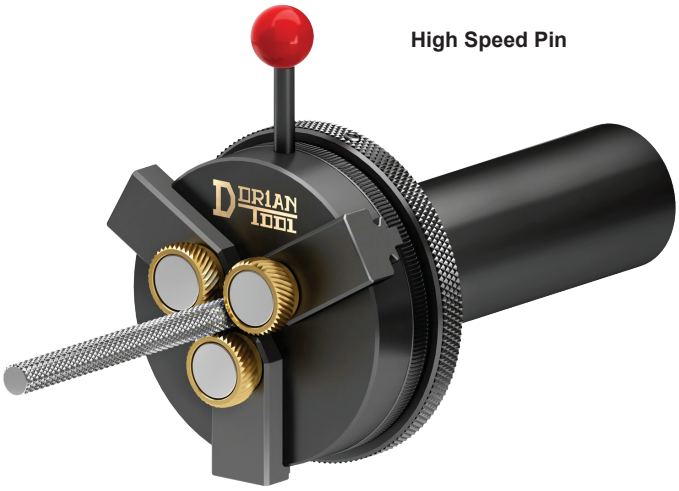
3 WHEEL KNURLING TOOL

FOR CUTTING & FORMING

Infinite Lengths with Diameters Small as .085” to 1.500”



Heavy Duty Shoulderless Carbide Pin



High Speed Pin

PROPERTIES

1. For small diameters
When side pressure does not allow the use of a one or two wheel knurling tool.

2. For long lengths
When support or live center is not permissible. The part would deflect if a standard one or two wheel knurling tool is used.

3. For high precision knurling
When the finished diameter of the knurled part demands close tolerance. The three wheel knurling system applies less pressure per wheel controlling the displacement and the form of the material. This makes the knurl uniform and precise.

4. For high production
High production without sacrificing performance and quality.

5. For automation
When cost is a factor. The high performance of this tool will keep the manufacturing cost lower.

6. Which machine to use on
Automatic Screw Machines, CNC Lathes, and Turret Lathes.

Three wheel knurling tool Features:

- Minimum diameter .085"
- Maximum diameter 1.500"
- For straight or diamond knurl
- Infinite lengths
- Precise scroll gear
- Fine diameter adjustment
- Dial allows for visual diameter adjustment
- Knurl to a shoulder
- Self-adjust to parts and tool misalignment
- Easy to setup
- Simple to operate
- Manual knurl diameter release for manual lathes

3WSKT -Three wheel knurling tool with optional round or square shanks

- Made of heat treated precision ground alloy steel.
- The dovetail guide and adjustable arms ensure the most possible accuracy and rigidity.
- A precise scroll gear allows for fine diameter settings.
- Scaled dial makes setting the diameter easy.
- This tool is engineered for most demanding knurling jobs in Screw Machine, C.N.C. Lathe, and Turret Lathe Applications.
- Square shank can be reversed for right hand or left hand operation.
- Square shank with preset center height.

Resulting Knurl Pattern

Straight pattern with 3 straight wheels

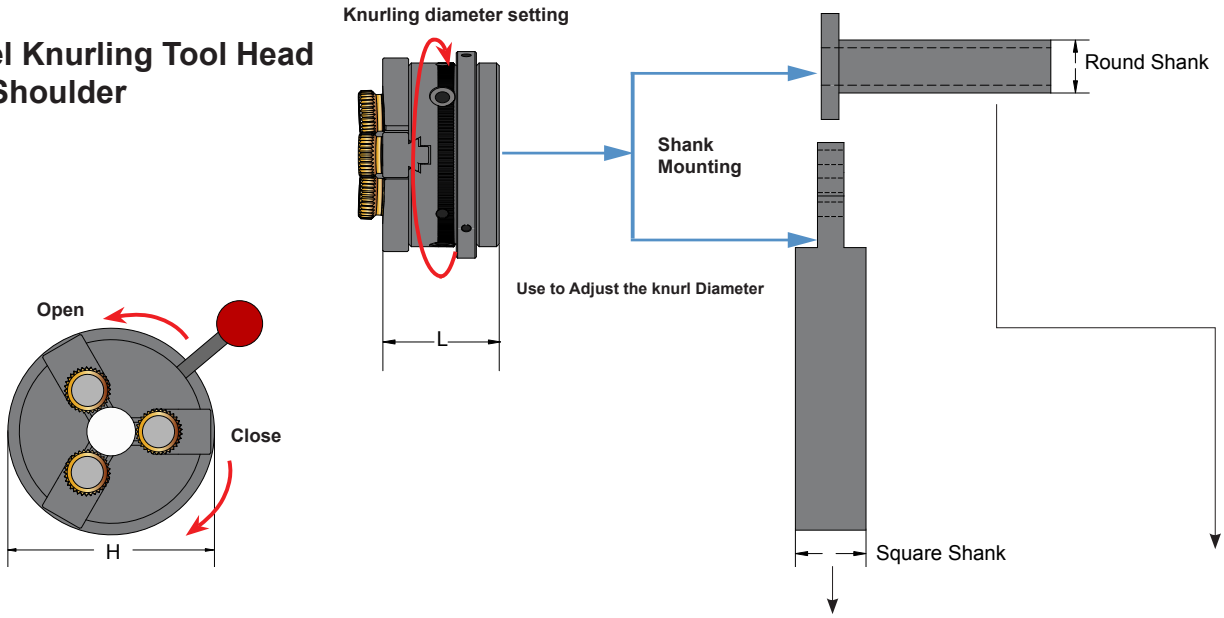
Male 60º diamond pattern with diagonal wheels (2 Right & 1 Left or 2 Left & 1 Right)

Recommended Use:

For best results, use beveled knurl wheels. End-feed the knurling tool into the blank until the desired length of the knurl is done.

The Three Wheel Knurling Tool can knurl up to a shoulder, minimum diameter of 2,16mm up to 38,1mm diameter, and infinite lengths.
The Heavy Duty Three Wheel Knurling Tool is recommended for shoulderless applications for improved wheel life.

3 Wheel Knurling Tool Head to the Shoulder



Specifications

Description	UPC #	Max. Capacity	H Body	L Width	Knurl Wheel Style	Knurl Pin Set***	UPC #
3WKT-06-2	23004	.085" to 0.250"	1.750"	1.575"	SW2 *	SW2.0P-3S	29060
3WKT-12-2	23009	.085" to 0.500"	2.250"	1.575"	SW2 *	SW2.0P-3S	29060
3WKT-25-2	23024	0.125" to 1.000"	3.000"	1.575"	SW2 *	SW2.0P-3S	29060
3WKT-40-2	23034	.187" to 1.500"	4.250"	2.440"	SW2 *	SW2.0P-3S	29060

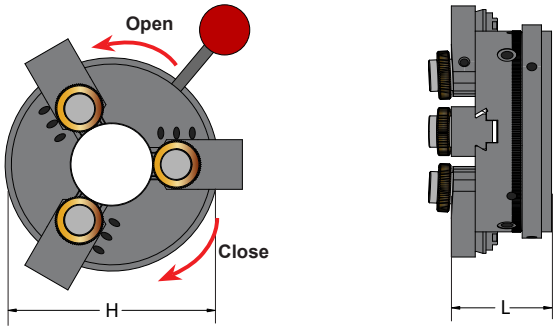
Optional Square Shank

Description	UPC #	Shank Size Square	Shank Size Length
3WSKT-06-50	23095	.500"	3.00"
3WSKT-06-162	23097	.625"	3.50"
3WSKT-06-75	23099	.750"	4.00"
3WSKT-12-162	23082	.625"	3.50"
3WSKT-12-75	23102	.750"	4.00"
3WSKT-12-100	23078	1.00"	5.00"
3WSKT-25-75	23079	.750"	4.00"
3WSKT-25-100	23080	1.00"	5.00"
3WSKT-40-100	23081	1.00"	5.00"

Optional Round Shank

Description	UPC #	Shank Size Dia.	Shank Size Length
3WRKT-06-50	23110	.500"	3.00"
3WRKT-06-162	23106	.625"	3.50"
3WRKT-06-75	23111	.750"	4.00"
3WRKT-12-162	23115	.625"	3.50"
3WRKT-12-75	23112	.750"	4.00"
3WRKT-12-100	23114	1.00"	5.00"
3WRKT-25-75	23130	.750"	4.00"
3WRKT-25-100	23124	1.00"	5.00"
3WRKT-40-100	23140	1.00"	5.00"

3-Wheel Knurling Tool Heavy Duty Shoulder-less



3 Wheels Knurling Tool Head Specification

Description	UPC #	Capacity	H	L	Knurl Wheel Series	Knurl Pin Set	UPC #
3WKT-40-M	23033	.187" to 1.500"	4.250"	2.645"	M**	SM4.0P-3S	29092

Optional Square Shank

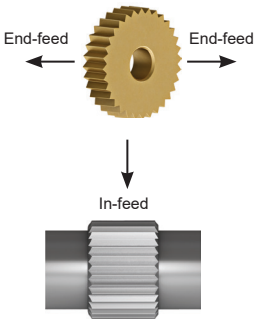
Description	UPC #	Shank Size Square	Shank Size Length
3WSKT-40-100	23081	1.00"	5.00"

Optional Round Shank

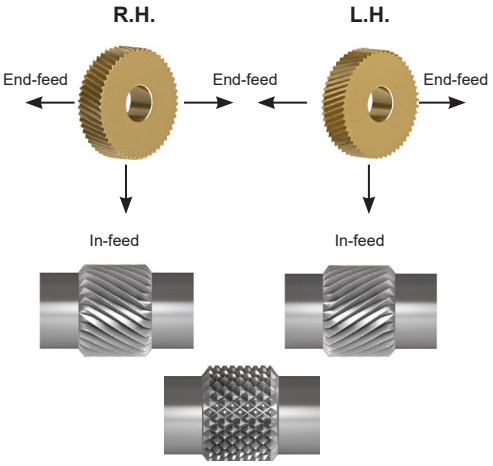
Description	UPC #	Shank Size Square	Shank Size Length
3WRKT-40-100	23140	1.00"	5.00"

Knurling Wheel Tooth Pattern & Workpiece Knurl Pattern

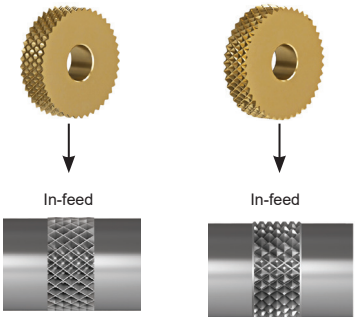
Straight Tooth



30º Diagonal Helix Angle



60º Diamond Angle

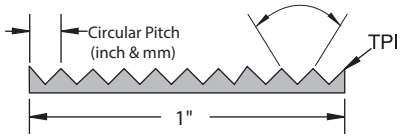


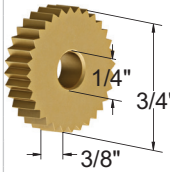
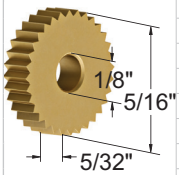
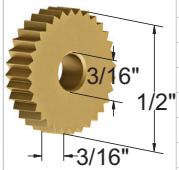
Edge Prep

Full Faced: Sharp leading edge for Cutting Type knurling tools only.

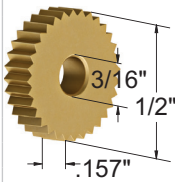
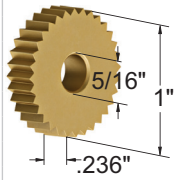
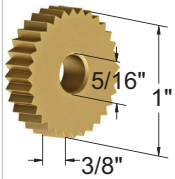
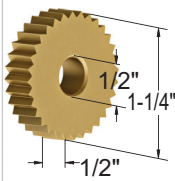
Beveled Edge: Edge security for forming type knurling tools only.

Knurl Wheel Material
High Speed Steel Knurl Wheels: Tough and shock resistant. Best recommended for materials such as Carbon Steel, Alloy Steel, and Stainless Steel.
Cobalt Knurl Wheels: The 8.5% cobalt content adds hardness and wear resistance to the wheels. Best recommended for abrasive and soft materials such as Free Machining Steel, Aluminum, and nonferrous materials

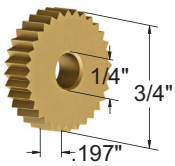
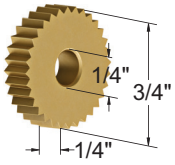
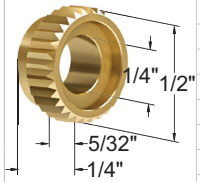
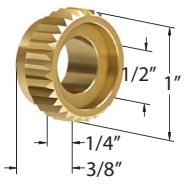


Knurl Wheel Series	Description	Pattern	Grade	Edge Prep	Pitch 10 (TPI)	12 (TPI)	14 (TPI)	16 (TPI)	20 (TPI)	25 (TPI)	30 (TPI)	35 (TPI)	40 (TPI)	50 (TPI)	80 (TPI)
A 	AS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	23502	23504	23506	23508	23510	23512	23514	23516	23518	23520	-
	AS-TPI-HSB			Beveled Corner	-	23537	-	23541	23543	-	-	-	-	-	-
	AS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	23576	23578	23580	23582	-	-	-
	AS-TPI-CB			Beveled Corner	-	23603	-	23607	-	23611	23613	23615	23617	23619	-
	ADR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	23634	23636	23638	23640	23642	23644	23646	-	23650	23652	-
	ADR-TPI-HSB			Beveled Corner	23667	23669	-	-	23675	23677	-	-	23683	-	-
	ADR-TPI-C		Cobalt TiN Coated	Sharp Corner	23700	23702	-	23706	23708	23710	-	-	-	-	-
	ADR-TPI-CB			Beveled Corner	-	-	23737	-	-	23743	-	23747	-	-	-
	ADL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	23766	23768	23770	23772	23774	23776	23778	-	23782	23784	-
	ADL-TPI-HSB			Beveled Corner	23799	23801	23803	-	23807	23809	-	-	23815	-	-
	ADL-TPI-C		Cobalt TiN Coated	Sharp Corner	23832	23834	-	23838	23840	23842	-	-	-	-	-
	ADL-TPI-CB			Beveled Corner	-	-	23869	-	-	23875	23877	23879	-	-	-
	AM-TPI-HS	Male Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	23906	23908	-	-	23914	23916	-
	AM-TPI-HSB			Beveled Corner	-	-	-	-	23939	-	-	-	-	-	-
	AF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	23970	-	-	-	-	-	-	-
	AF-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
B 	BS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	24110	-	-
	BS-TPI-HSB			Beveled Corner	-	-	-	-	-	-	24129	-	-	-	24137
	BS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	24152	24154	24156	24158	-
	BS-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	BDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	-	24200	24202	-	-
	BDR-TPI-HSB			Beveled Corner	-	-	-	-	-	-	24221	-	-	-	-
	BDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	24248	-	-
	BDR-TPI-CB			Beveled Corner	-	-	-	-	-	-	24267	-	-	-	-
	BDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	-	24292	24294	-	-
	BDL-TPI-HSB			Beveled Corner	-	-	-	-	-	-	24313	-	-	-	-
	BDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	24340	-	-
	BDL-TPI-CB			Beveled Corner	-	-	-	-	-	-	24359	-	-	-	-
C 	CS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	-	24502	24504	24506	24508	24510	24512	24514	24516
	CS-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	CS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	24562	-	24566	24568	24570
	CS-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	24597
	CDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	-	-	24610	-	24614	24616	-	-	-	24624
	CDR-TPI-HSB			Beveled Corner	-	-	-	-	-	24641	-	-	-	-	-
	CDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	24668	24670	-	24674	-	24678
	CDR-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	CDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	-	-	24718	24720	24722	24724	-	-	-	24732
	CDL-TPI-HSB			Beveled Corner	-	-	-	-	-	24749	-	-	-	-	-
	CDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	24776	24778	-	24782	-	24786
	CDL-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	CM-TPI-HS	Male Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	24836	-	-
	CM-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	CF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	24884	-	-	-	24892	-
	CF-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-

NOTE: For forming-type knurling tools, beveled wheels are recommended for longer tool life. For cutting-type tools, full-face (sharp corner) wheels are the only choice.
All Dorian Tool knurl wheels are PVD TiN coated to provide less friction and longer tool life. For a complete selection of knurling wheels, please refer to our general catalog.

Knurl Wheel Series	Description	Pattern	Grade	Edge Prep	Pitch 10 (TPI)	12 (TPI)	14 (TPI)	16 (TPI)	20 (TPI)	25 (TPI)	30 (TPI)	35 (TPI)	40 (TPI)	50 (TPI)	80 (TPI)
D 	DS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	-	25001	25003	25005	25007	25009	-	25013	25015
	DS-TPI-HSB			Beveled Corner	-	-	-	-	25030	25032	25034	25036	25038	25040	-
	DS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	25004	25006	25008	25010	-	-	25016
	DS-TPI-CB			Beveled Corner	-	-	-	-	25031	25033	25035	-	25039	25041	25043
	DDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	-	-	25055	25057	25059	25061	25063	25065	25067	25069
	DDR-TPI-HSB			Beveled Corner	-	-	-	25082	25084	25086	25088	25090	25092	25094	-
	DDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	25056	25058	-	25062	-	-	-	-
	DDR-TPI-CB			Beveled Corner	-	-	-	25083	25085	25087	25089	-	25093	-	25097
	DDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	-	-	25109	25111	25113	25115	25117	25119	25121	25123
	DDL-TPI-HSB			Beveled Corner	-	-	-	25136	25138	25140	25142	25144	25146	25148	-
	DDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	25110	25112	-	25116	-	-	-	-
	DDL-TPI-CB			Beveled Corner	-	-	-	25137	25139	25141	25143	-	25147	-	25151
	DF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	25169	-	-	-	-
	DF-TPI-HS			Beveled Corner	-	-	-	-	25192	-	-	-	-	-	-
	DF-TPI-C	Female Diamond	Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	25170	-	25174	-	-
	DF-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	25205
M 	MS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	25303	25305	25307	25309	25311	25313	25315	25317	-	25321	-
	MS-TPI-HSB			Beveled Corner	25336	25338	25340	25342	25344	25346	25348	25350	-	-	-
	MS-TPI-C		Cobalt TiN Coated	Sharp Corner	25304	25306	25308	25310	25312	25314	25316	25318	-	25322	-
	MS-TPI-CB			Beveled Corner	25337	25339	25341	25343	25345	25347	25349	-	-	-	-
	MDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	25369	25371	25373	25375	25377	25379	-	25383	-	-	-
	MDR-TPI-HSB			Beveled Corner	25402	25404	25406	25408	25410	25412	25414	25416	-	-	-
	MDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	25372	25374	25376	25378	25380	25382	-	25386	-	-
	MDR-TPI-CB			Beveled Corner	-	25405	25407	25409	25411	25413	25415	-	-	-	-
	MDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	25435	25437	25439	25441	25443	25445	25447	25449	-	-	-
	MDL-TPI-HSB			Beveled Corner	25468	25470	25472	25474	25476	25478	25480	25482	-	-	-
	MDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	25438	25440	25442	25444	25446	25448	-	25452	-	-
	MDL-TPI-CB			Beveled Corner	-	25471	25473	25475	25477	25479	25481	-	-	-	-
	MF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	25513	-	-	-	-
	MF-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	MF-TPI-C	Female Diamond	Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	25514	-	-	-	-
	MF-TPI-CB			Beveled Corner	-	-	-	-	25543	-	25547	-	-	-	-
O 	OS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	25604	25606	25608	25610	25612	25614	25616	25618	-	-	-
	OS-TPI-HSB			Beveled Corner	-	-	25641	25643	25645	25647	25649	-	-	-	-
	OS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	25674	25676	25678	25680	25682	25684	-	-	-
	OS-TPI-CB			Beveled Corner	-	-	25707	25709	25711	25713	-	-	-	-	-
	ODR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	25736	-	-	25742	-	-	-	-	-	-	-
	ODR-TPI-HSB			Beveled Corner	-	25771	-	-	25777	25779	-	-	-	-	-
	ODR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	25812	-	-	-	-	-
	ODR-TPI-CB			Beveled Corner	-	-	25839	-	-	25845	-	-	-	-	-
	ODL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	25868	25870	-	25874	-	-	-	-	-	-	-
	ODL-TPI-HSB			Beveled Corner	-	25903	-	-	25909	25911	-	-	-	-	-
	ODL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	25938	-	-	25944	-	-	-	-	-
	ODL-TPI-CB			Beveled Corner	-	-	25971	-	-	25977	-	-	-	-	-
	OM-TPI-HS	Male Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	26008	26010	26012	-	-	-	-
	OM-TPI-HSB			Beveled Corner	-	-	-	-	-	26043	-	-	-	-	-
	OF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	26074	26076	26078	-	-	-	-
	OF-TPI-HSB			Beveled Corner	-	-	-	-	26107	26109	26111	-	-	-	-
P 	PS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	26202	-	-	-	-	-	-	-	-
	PS-TPI-HSB			Beveled Corner	26215	26217	-	-	-	26225	-	-	-	-	-
	PS-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	26238	26240	26242	-	-	-	-	-
	PS-TPI-CB			Beveled Corner	-	-	-	-	26257	26259	26261	-	-	-	-
	PDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	26268	-	-	26274	-	26278	-	-	-	-
	PDR-TPI-HSB			Beveled Corner	-	26285	-	-	-	26293	-	-	-	-	-
	PDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	-	-	-
	PDR-TPI-CB			Beveled Corner	-	-	-	26323	-	-	-	-	-	-	-
	PDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	26336	-	-	26342	-	26346	-	-	-	-
	PDL-TPI-HSB			Beveled Corner	-	26353	-	-	-	26361	-	-	-	-	-
	PDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	-	-	-
	PDL-TPI-CB			Beveled Corner	-	-	-	26391	-	-	-	-	-	-	-
	PM-TPI-HS	Male Diamond	High Speed TiN Coated	Sharp Corner	-	26404	-	26408	26410	-	-	-	-	-	-
	PM-TPI-HSB			Beveled Corner	-	-	-	-	26427	26429	-	-	-	-	-
	PF-TPI-C	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	26442	-	26446	-	-	-	-	-
	PF-TPI-CB			Beveled Corner	-	-	-	26459	-	-	-	-	-	-	-

NOTE: For forming-type knurling tools, beveled wheels are recommended for longer tool life. For cutting-type tools, full-face (sharp corner) wheels are the only choice.
All Dorian Tool knurl wheels are PVD TiN coated to provide less friction and longer tool life. For a complete selection of knurling wheels, please refer to our general catalog.

Knurl Wheel Series	Description	Pattern	Grade	Edge Prep	Pitch 10 (TPI)	12 (TPI)	14 (TPI)	16 (TPI)	20 (TPI)	25 (TPI)	30 (TPI)	35 (TPI)	40 (TPI)	50 (TPI)	80 (TPI)
R 	RS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	26501	26503	26505	26507	26509	26511	26513	26515	26517	26519	-
	RS-TPI-HSB			Beveled Corner	26532	-	26536	26538	26540	26542	26544	-	26548	-	-
	RS-TPI-C		Cobalt TiN Coated	Sharp Corner	26502	26504	26506	26508	26510	26512	26514	26516	26518	26520	-
	RS-TPI-CB			Beveled Corner	-	26535	26537	26539	26541	26543	26545	26547	-	-	-
	RDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	26563	-	26567	26569	26571	26573	26575	-	26579	-	-
	RDR-TPI-HSB			Beveled Corner	-	-	-	-	-	26604	26606	26608	-	26612	-
	RDR-TPI-C		Cobalt TiN Coated	Sharp Corner	26564	26566	26568	-	26572	26574	26576	-	26580	26582	-
	RDR-TPI-CB			Beveled Corner	-	-	-	-	26603	-	26607	-	26611	-	-
	RDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	26625	-	26629	-	26633	26635	26637	-	26641	-	-
	RDL-TPI-HSB			Beveled Corner	-	-	-	-	-	26666	26668	26670	-	26674	-
	RDL-TPI-C		Cobalt TiN Coated	Sharp Corner	26626	26628	26630	-	26634	26636	26638	-	26642	26644	-
	RDL-TPI-CB			Beveled Corner	-	-	-	-	26665	-	26669	-	-	-	-
	RF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	26697	-	-	-	-	-
	RF-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	RF-TPI-C	Female Diamond	Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	-	26706	-
	RF-TPI-CB			Beveled Corner	-	-	-	-	-	-	26731	-	-	-	-
S 	SS-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	26804	26806	26808	26810	26812	26814	26816	26818	-	-
	SS-TPI-HSB			Beveled Corner	-	-	-	-	26841	26843	26845	-	-	-	-
	SS-TPI-C		Cobalt TiN Coated	Sharp Corner	26862	26864	-	26868	26870	26872	26874	-	-	-	-
	SS-TPI-CB			Beveled Corner	-	26895	-	-	-	26903	26905	-	-	-	-
	SDR-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	26924	26926	-	-	-	26934	26936	-	-	26942	-
	SDR-TPI-HSB			Beveled Corner	-	-	26959	-	-	26965	26967	-	-	-	-
	SDR-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	26994	-	26998	27000	-	27004	-
	SDR-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	27033	-	-
	SDL-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	27048	27050	-	-	-	27058	27060	-	-	27066	-
	SDL-TPI-HSB			Beveled Corner	-	-	27083	-	-	27089	-	-	-	-	-
	SDL-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	27118	-	27122	27124	-	27128	-
	SDL-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	27157	-	-
	SM-TPI-HS	Male Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	27178	-	27182	-	-	-	-	-
	SM-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	SF-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	27250	27252	-
	SF-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
SW2 	SW2S-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	-	27401	27403	27405	27407	-	27411	-	-
	SW2S-TPI-HSB			Beveled Corner	-	-	-	-	27428	27430	27432	-	-	-	-
	SW2S-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	27402	27404	27406	27408	27410	27412	-	-
	SW2S-TPI-CB			Beveled Corner	-	-	-	27427	27429	27431	27433	27435	27437	27439	-
	SW2R-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	-	-	-	27453	-	27457	27459	-	-	-
	SW2R-TPI-HSB			Beveled Corner	-	-	-	-	27478	27480	27482	-	-	-	-
	SW2R-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	27454	27456	27458	-	-	-	-
	SW2R-TPI-CB			Beveled Corner	-	-	-	-	27479	27481	27483	-	-	-	-
	SW2L-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	-	-	27501	27503	27505	27507	27509	-	-	-
	SW2L-TPI-HSB			Beveled Corner	-	-	-	27526	27528	27530	27532	-	-	-	-
	SW2L-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	-	-	27504	27506	27508	-	-	-	-
	SW2L-TPI-CB			Beveled Corner	-	-	-	-	27529	27531	27533	-	-	-	-
	SW2F-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	-	27551	-	27555	27557	-	27561	27563	-
	SW2F-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	SW2F-TPI-C	Female Diamond	Cobalt TiN Coated	Sharp Corner	-	-	-	-	-	-	-	-	-	-	-
	SW2F-TPI-CB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
SW4 	SW4S-TPI-HS	Straight	High Speed TiN Coated	Sharp Corner	-	-	28001	28003	28005	28007	28009	-	28013	-	-
	SW4S-TPI-HSB			Beveled Corner	-	-	28028	28030	28032	28034	28036	-	28040	-	-
	SW4S-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	28002	28004	28006	28008	28010	28012	28014	-	-
	SW4S-TPI-CB			Beveled Corner	-	-	28029	28031	28033	28035	28037	-	28041	28043	-
	SW4R-TPI-HS	Diagonal Right	High Speed TiN Coated	Sharp Corner	-	-	28055	28057	28059	28061	28063	-	-	-	-
	SW4R-TPI-HSB			Beveled Corner	-	-	28082	28084	28086	28088	28090	-	-	-	-
	SW4R-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	28056	28058	28060	28062	28064	28066	28068	28070	-
	SW4R-TPI-CB			Beveled Corner	-	-	28083	28085	28087	28089	28091	28093	-	-	-
	SW4L-TPI-HS	Diagonal Left	High Speed TiN Coated	Sharp Corner	-	-	28109	28111	28113	28115	28117	-	-	-	-
	SW4L-TPI-HSB			Beveled Corner	-	-	28136	28138	28140	28142	28144	-	-	-	-
	SW4L-TPI-C		Cobalt TiN Coated	Sharp Corner	-	-	28110	28112	28114	28116	28118	28120	28122	28124	-
	SW4L-TPI-CB			Beveled Corner	-	-	28137	28139	28141	28143	28145	28147	-	-	-
	SW4F-TPI-HS	Female Diamond	High Speed TiN Coated	Sharp Corner	-	-	28163	28165	28167	-	-	-	-	-	-
	SW4F-TPI-HSB			Beveled Corner	-	-	-	-	-	-	-	-	-	-	-
	SW4F-TPI-C	Female Diamond	Cobalt TiN Coated	Sharp Corner	-	-	-	28166	28168	-	-	-	-	-	-
	SW4F-TPI-CB			Beveled Corner	-	-	-	28193	28195	-	-	-	-	-	-

NOTE: For forming-type knurling tools, beveled wheels are recommended for longer tool life. For cutting-type tools, full-face (sharp corner) wheels are the only choice.
All Dorian Tool knurl wheels are PVD TiN coated to provide less friction and longer tool life. For a complete selection of knurling wheels, please refer to our general catalog.