

## TWIN WHEEL KNURLING

Cut or Form with no side pressure



### Problems getting a decent knurl?

- \* High side forces cause premature spindle wear and turrets can be misaligned.
- \* Holders are cheaply made with wheels running on pins rather than bearings.
- \* Most wheels have milled teeth compromising finish and accuracy.
- \* Ordinary twin wheel tools still initiate side pressure, even when cutting - and you can't go up to a shoulder

### The Böni Knurling Tool is the answer.

Böni knurling tools function in a fundamentally different way to conventional knurling tools. The knurling wheels machine the workpiece tangentially, on opposite sides, so that there is no lateral pressure on the work and cross spindle bearings. The operating forces occurring are absorbed by the knurling tool, regardless of whether it is cutting or rolling.

Depending on the type of knurl and quality of material, we are able to cut or roll the knurl with the same tool.

Optional heads are available for Straight, Diamond (30°) and Cross (45°) knurls. Straight knurls up to a shoulder can also be produced (0°).

Knurls can be produced anywhere along the length of a workpiece.

The wheels are mounted on precision ground spindles which run in needle roller bearings for smooth operation and long life.

Full knurls are produced whatever the workpiece diameter.

A calculation of the finished size can be made so the turned diameter is estimated to speed up setting.

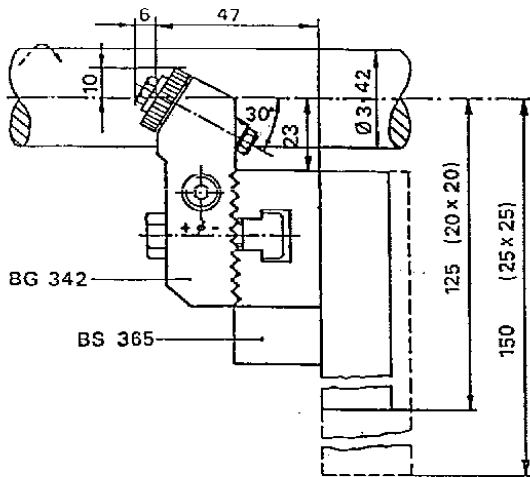
Each tool is supplied with setting tools and an operating manual.

Standard heads (3 sizes) cover 3-100mm for CNC lathes and versions for manual lathes (3) cover 3-153mm

Special tools for face and tapered knurls can be supplied to order.

## SETTING

### Example: BG0304220



Mount the knurling tool with its rectangular shank like a normal turning tool. Set the centre of the knurling rail approximately to the machine centre height. On CNC lathes with wedge clamping it will be necessary to first mount the shank into the turret prior to attaching the rails.

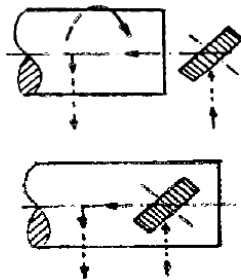
Mount the holder set on to the rails. Fit knurling wheels to the required pitch.

Open the holder set wide enough to pass over the workpiece diameter. Position the knurling wheels at a tangent to the workpiece centre.

Accurate positioning to the workpiece centre is important. When using this particular tool the distance from the rail to the workpiece centre is 23mm.

With the hexagon scale ring key turn the setting spindle in the (-) direction until both wheels touch the workpiece. Tighten the clamping screw on one holder. Retract the tool from the workpiece and set the depth of knurl using the scale ring key (-) then tighten the clamping screw. Slacken the clamping screw on the first holder and set the depth of knurl (-). Both wheels should be set the same.

## OPERATING METHOD



Direct an ample supply of coolant (emulsion or cutting oil) on to the workpiece.

Having set the cutting and feed rates (in this case, say, 500 RPM at 0.1mm feed per rev.). The approach to the workpiece should be at an increased feed rate, say, 0.25mm per rev. The traverse feed should then be engaged without a dwell. At the end of the knurl first retract the tool before disengaging the feed.

Should the knurl be too shallow, re-adjust the depth and re-cut. The depth can also be adjusted by varying the diameter of the workpiece.

The needle roller bearings should be lubricated twice daily using the grease gun provided.

## WHEEL SELECTION

Cutting Wheels



Aluminium alloys, Brass, Bronze, Synthetics and High Tensile materials

Forming Wheels

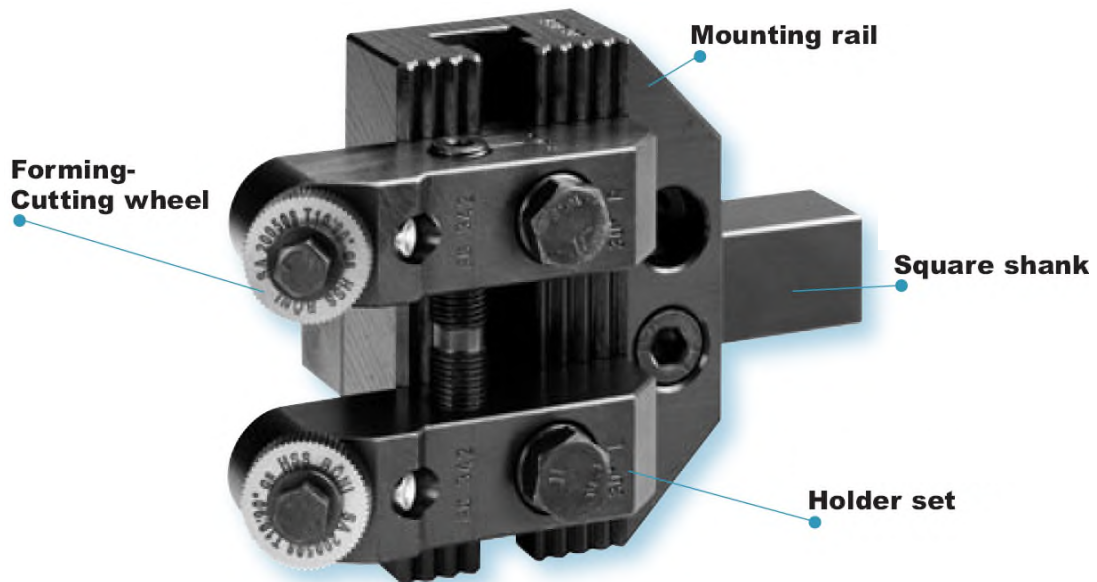


Low Tensile Steels, Steel tube and other malleable materials

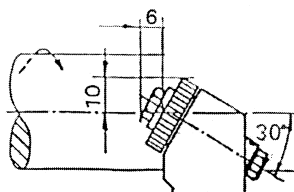
## SPEEDS & FEEDS

Material	M/min	Feed per Rev.
Steel up to 600 N	40 - 60	0.10 - 0.20
Steel up to 900 N	25 - 40	0.05 - 0.15
Stainless Steel	10 - 25	0.04 - 0.12
Brass	80 - 100	0.05 - 0.15
Aluminium	100 - 120	0.10 - 0.20
Synthetics	40 - 150	0.05 - 0.20

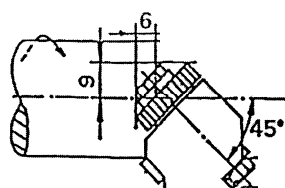
## HOLDER B65 (SQUARE SHANK)



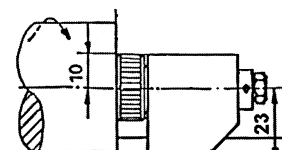
Order Code	Capacity (mm)	Shank (mm)	Approach	Type of Knurl	Wheel combinations	Wheel Size	Holder set	Mounting Rail	Shank
BG0304216	3-42	16x16	30°	Diamond & Straight	SL/SR - SA/SA - BO/BO	20	BG342	BS365	B1616
BG0304220		20x20							B2020
BG0304225		25x25							B2525
BG2006516	20-65	16x16	30°	Diamond & Straight	SL/SR - SA/SA - BO/BO	20	BG2065	BS365	B1616
BG2006520		20x20							B2020
BG2006525		25x25							B2525
BK0304216	3-42	16x16	45°	Cross	SA/SA - BO/BO	20	BK342	BS365	B1616
BK0304220		20x20							B2020
BK0304225		25x25							B2525
BK2006516	20-65	16x16	45°	Cross	SA/SA - BO/BO	20	BK2065	BS365	B1616
BK2006520		20x20							B2020
BK2006525		25x25							B2525
BE0304216	3-42	16x16	0°	Straight up to a Shoulder	BO/BO - EA/EA - EBO/EBO	20	BE342	BS365	B1616
BE0304220		20x20							B2020
BE0304225		25x25							B2525
BE2006516	20-65	16x16	0°	Straight up to a Shoulder	BO/BO - EA/EA - EBO/EBO	20	BE2065	BS365	B1616
BE2006520		20x20							B2020
BE2006525		25x25							B2525



BG

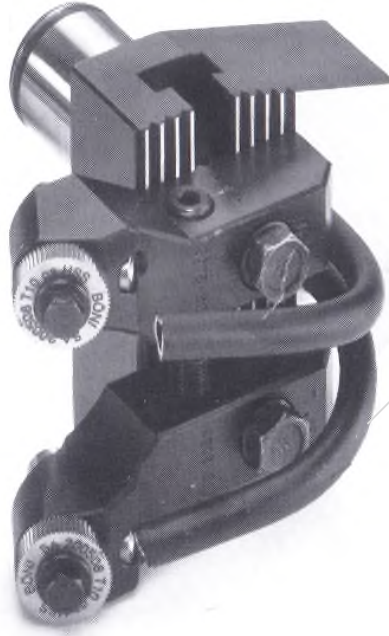


BK

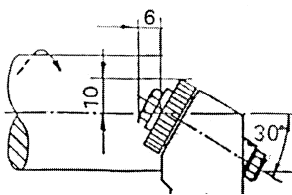


BE

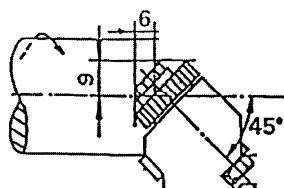
## HOLDER B65 (VDI SHANK)



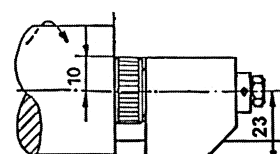
Order Code	Capacity (mm)	Shank	Approach	Type of Knurl	Wheel combinations	Wheel Size	Holder set	Mounting Shank
<b>BG0304230</b>	3-30	VDI30	30°	Diamond & Straight	SL/SR - SA/SA - BO/BO	20	BG342	1702437
<b>BG0304240</b>	3-36	VDI40						1703237
<b>BG0304250</b>	3-42	VDI50						1704237
<b>BG2006530</b>	20-55	VDI30	30°	Diamond & Straight	SL/SR - SA/SA - BO/BO	20	BG2065	1702437
<b>BG2006540</b>	20-60	VDI40						1703237
<b>BG2006550</b>	20-65	VDI50						1704237
<b>BK0304230</b>	3-30	VDI30	45°	Cross	SA/SA - BO/BO	20	BK342	1702437
<b>BK0304240</b>	3-36	VDI40						1703237
<b>BK0304250</b>	3-42	VDI50						1704237
<b>BK2006530</b>	20-55	VDI30	45°	Cross	SA/SA - BO/BO	20	BK2065	1702437
<b>BK2006540</b>	20-60	VDI40						1703237
<b>BK2006550</b>	20-65	VDI50						1704237
<b>BE0304230</b>	3-30	VDI30	0°	Straight up to a Shoulder	BO/BO - EA/EA - EBO/EBO	20	BE342	1702437
<b>BE0304240</b>	3-36	VDI40						1703237
<b>BE0304250</b>	3-42	VDI50						1704237
<b>BE2006530</b>	20-55	VDI30	0°	Straight up to a Shoulder	BO/BO - EA/EA - EBO/EBO	20	BE2065	1702437
<b>BE2006540</b>	20-60	VDI40						1703237
<b>BE2006550</b>	20-65	VDI50						1704237



**BG**

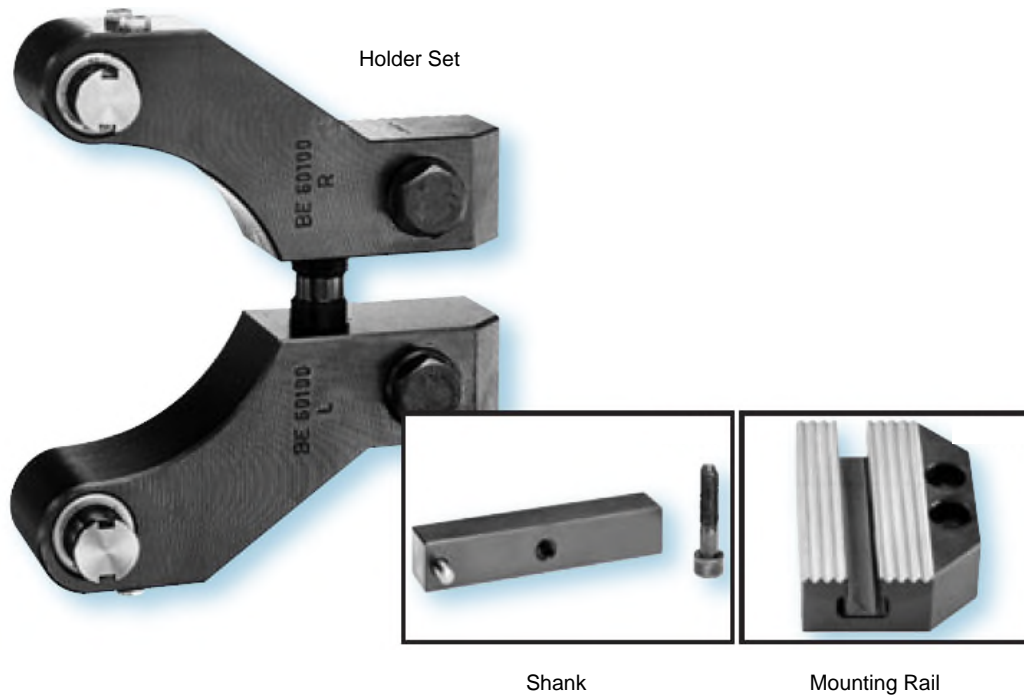


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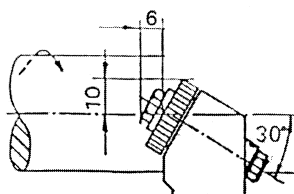


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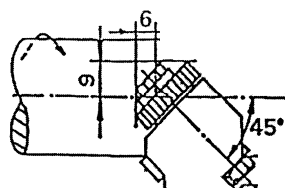
## HOLDER B100



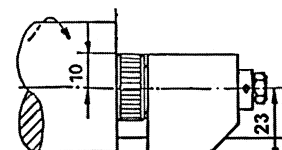
Order Code	Capacity (mm)	Shank (mm)	Approach	Type of Knurl	Wheel combinations	Wheel Size	Holder set	Mounting Rail	Shank
<b>BG6010020</b> <b>BG6010025</b> <b>BG6010032</b>	60-100	20x20 25x25 32x32	30°	Diamond & Straight	SL/SR - SA/SA - BO/BO	30	BG60100	BS60100	B2020/100 B2525/100 B3232/100
<b>BK6010020</b> <b>BK6010025</b> <b>BK6010032</b>	60-100	20x20 25x25 32x32	45°	Cross	SA/SA - BO/BO	30	BK60100	BS60100	B2020/100 B2525/100 B3232/100
<b>BE6010020</b> <b>BE6010025</b> <b>BE6010032</b>	60-100	20x20 25x25 32x32	0°	Straight up to a Shoulder	BO/BO - EA/EA - EBO/EBO	30	BE60100	BS60100	B2020/100 B2525/100 B3232/100



BG

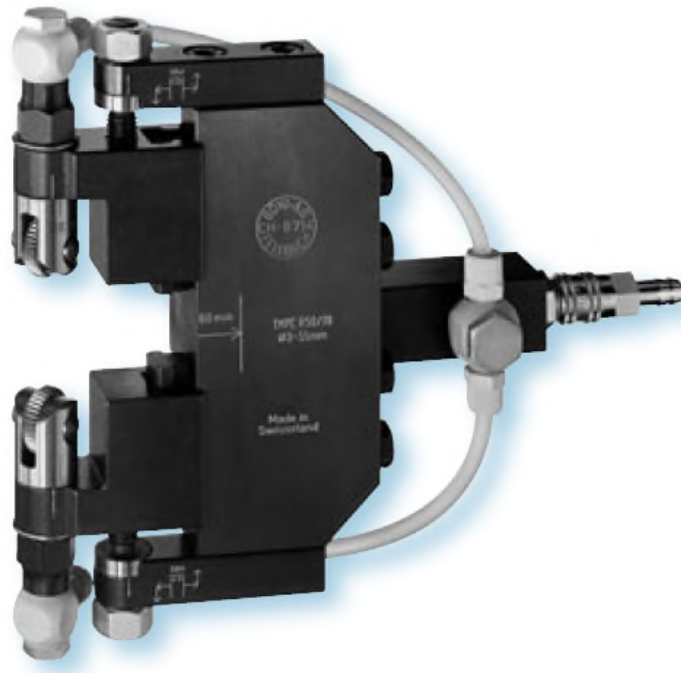


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BE

## HOLDER – R TYPE – MANUAL LATHES




Order Code	Capacity (mm)	Shank (mm)	Approach (Adjustable)	Type of Knurl	Wheel combinations	Wheel Size
<b>R50/78-20</b> <b>R50/78-25</b>	3-55	20x20 25x25	0° / 30° / 45°	Diamond, Cross & Straight	SR/SR - SA/SA - BO/BO	20
<b>R100/78-25</b> <b>R100/78-30</b>	50-105	25x25 30x30	0° / 30° / 45°	Diamond, Cross & Straight	SR/SR - SA/SA - BO/BO	30
<b>R150/78-25</b> <b>R150/78-30</b>	100-153	25x25 30x30	0° / 30° / 45°	Diamond, Cross & Straight	SR/SR - SA/SA - BO/BO	30




## WHEELS (SIZE 20)


### HSS Cutting Wheels for Diamond 30° & Cross 45° knurls

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SA200508T05	20	5	8	0.5	BG & BK 342 & 2065 R50/78
	SA200508T06				0.6	
	SA200508T08				0.8	
	SA200508T10				1.0	
	SA200508T12				1.2	
	SA200508T16				1.6	


### HSS Cutting Wheels LH for Straight knurls (pair with RH wheels)

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SL200508T05	20	5	8	0.5	BG 342 & 2065
	SL200508T06				0.6	
	SL200508T08				0.8	
	SL200508T10				1.0	
	SL200508T12				1.2	
	SL200508T16				1.6	


### HSS Cutting Wheels RH for Straight knurls (pair with LH wheels)

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SR200508T05	20	5	8	0.5	BG 342 & 2065 R50/78
	SR200508T06				0.6	
	SR200508T08				0.8	
	SR200508T10				1.0	
	SR200508T12				1.2	
	SR200508T16				1.6	


### HSS Forming Wheels for Diamond 30°, Cross 45° RH & Straight knurls

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	BO200508T05	20	5	8	0.5	BG, BK & BE 342 & 2065 R50/78
	BO200508T06				0.6	
	BO200508T08				0.8	
	BO200508T10				1.0	
	BO200508T12				1.2	
	BO200508T16				1.6	

### HSS Forming Wheels for Straight knurls


Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	EA200808T08	20	8	8	0.8	BE 342 & 2065
	EA200808T10				1.0	
	EA200808T12				1.2	
	EA200808T16				1.6	

### HSS Forming Wheels for Straight knurls


Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	EBO200808T08	20	8	8	0.8	BE 342 & 2065
	EBO200808T10				1.0	
	EBO200808T12				1.2	
	EBO200808T16				1.6	

## WHEELS (SIZE 30)


### HSS Cutting Wheels for Diamond 30° & Cross 45° knurls

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SA300812T06	30	8	12	0.6	BG & BK 60100 R100/78 & 150/78
	SA300812T08				0.8	
	SA300812T10				1.0	
	SA300812T12				1.2	
	SA300812T16				1.6	
	SA300812T20				2.0	


### HSS Cutting Wheels LH for Straight knurls (pair with RH wheels)

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SL300812T06	30	8	12	0.6	BG 60100
	SL300812T08				0.8	
	SL300812T10				1.0	
	SL300812T12				1.2	
	SL300812T16				1.6	
	SL300812T20				2.0	


### HSS Cutting Wheels RH for Straight knurls (pair with LH wheels)

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	SR300812T06	30	8	12	0.6	BG 60100 R100/78 & 150/78
	SR300812T08				0.8	
	SR300812T10				1.0	
	SR300812T12				1.2	
	SR300812T16				1.6	
	SR300812T20				2.0	


### HSS Forming Wheels for Diamond 30°, Cross 45° RH & Straight knurls

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	BO300812T06	30	8	12	0.6	BG, BK & BE 60100 R100/78 & 150/78
	BO300812T08				0.8	
	BO300812T10				1.0	
	BO300812T12				1.2	
	BO300812T16				1.6	
	BO300812T20				2.0	

### HSS Forming Wheels for Straight knurls

Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	EA300912T08	20	8	8	0.8	BE 60100
	EA300912T10				1.0	
	EA300912T12				1.2	
	EA300912T16				1.6	
	EA300912T20				2.0	

### HSS Forming Wheels for Straight knurls

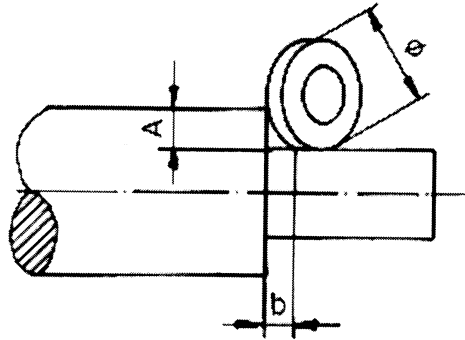
Illustration	Ordering Code	Diameter (mm)	Width (mm)	Bore (mm)	Pitch (mm)	Holder Set
	EBO300912T08	20	8	8	0.8	BE 60100
	EBO300912T10				1.0	
	EBO300912T12				1.2	
	EBO300912T16				1.6	
	EBO300912T20				2.0	



## UP TO A SHOULDER

### BG & BK series Holder sets

Due to the angular approach of the wheels it is not possible to knurl right up to a shoulder

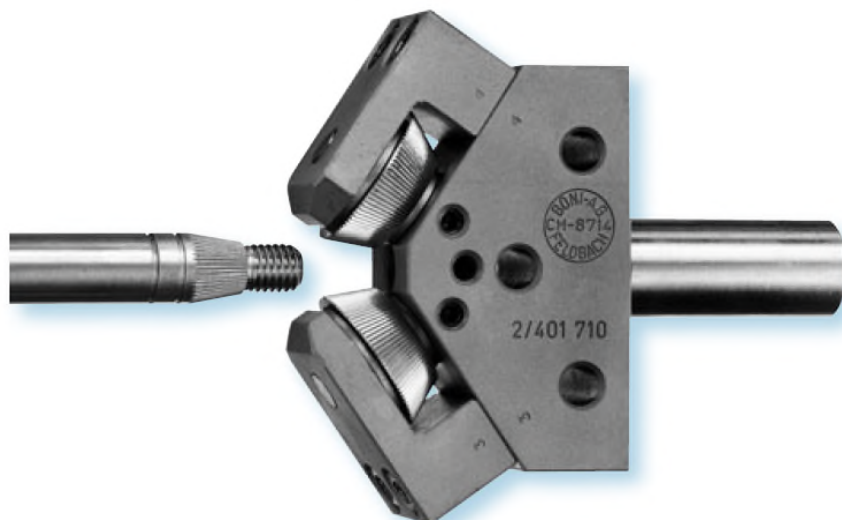


These tables show how near you can knurl to a shoulder

Holder Set	A →	> 5	< 4	< 2	1		
BG342/2065	b	6	5	4	3		
BK342/ 2065		6	5	4	3		

Holder Set	A →	> 10	< 8	< 6	< 4	< 2	1
BG60100	b	8	7	6	5	4	3
BK60100		10	8	7	6	5	4

### Taper Knurling



Ask for details