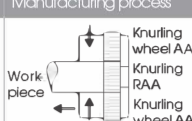
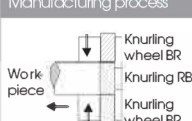
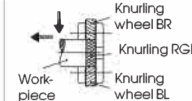
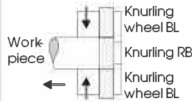


INSTRUCTION MANUAL





zeusECO / Knurling tools 841/851

Please read this operating manual carefully. Correct assembly and handling of the tool will save you set-up time and allow you to achieve optimal results.

KNURLING PROFILES (DIN 82) AND MANUFACTURING PROCESS

Knurling profile (DIN 82)	Manufacturing process	Knurling profile (DIN 82)	Manufacturing process
RAA knurl with straight pattern	 Knurling wheel AA Knurling RAA Knurling wheel AA	RBL left-hand knurl	 Knurling wheel BR Knurling RBL Knurling wheel BR
RGE left-/righthand knurl, raised points, 30°/45°	 Knurling wheel BR Knurling RGE Knurling wheel BL	RBR right-hand knurl	 Knurling wheel BL Knurling RBR Knurling wheel BL

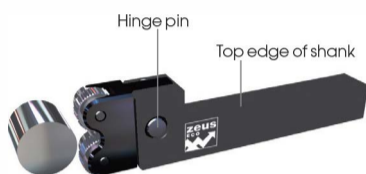
Tool series 841 / 851

Machining direction	Knurling profiles on workpiece DIN82:  RAA  RBL  RBR  RGE30°  RGE45°
radial/axial/ radial and axial	Selection of knurling wheels: 2 x AA 2 x BR 2 x BL 1 x BL30° / 1 x BR30° 1 x BL45° / 1 x BR45°

TOOL SETTING

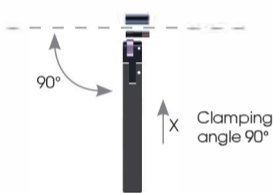
1. Setting the centre height

The centre height is integrated in the toolholder and corresponds to the top edge of the shank, or the centre of the hinge pin.

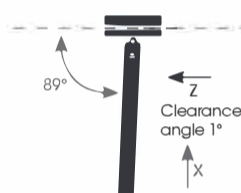


2. Clamping position of tool

2.1 Radial machining direction



2.2 Radial and axial machining direction

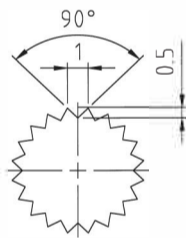


APPLICATION

3. Adjustment in X direction

Start the lathe with suitable parameters (see zeus knurling technology catalogue). For adjustment of the knurling depth, move the tool in X direction toward the workpiece. In the case of a 90° flank angle the adjustment (profile depth) is 1/2 the nominal pitch.

Impression depth:



4. Axial knurling

In axial knurling, first move tool in X direction (1 mm knurl width - if possible), adjust and then move in Z direction.

4. Cooling /lubrication

We recommend an ample supply of coolant /cutting oil to cool both the tool and the workpiece; this will prolong the life of the knurling wheels and prevent flaking material from being rolled in.

5. Dwell time during knurling

After reaching the end position (adjustment in X direction, knurl completely formed) the dwell time should not be more than 5-10 revolutions of the workpiece.

6. Manufacturer's recommendation:

Axle pin should be replaced regularly after a suitable number of cycles.

POSSIBLE PROBLEMS AND HOW TO SOLVE THEM

Troubleshooting	Cause:	Solution:
Excessive material distortion at knurling end.	Clearance angle not set correctly.	Set clearance angle correctly (see 2.3).
Profile appears "crushed".	Tool presses on workpiece in profile base.	Adjust to required dimension (see 3).
Profile is not completely formed.	Adjustment is smaller than profile depth.	Adjust to required dimension (see 3).
Irregular profile sharpness.	Workpiece is not running true. Axial run-out.	Turn workpiece diameter. Face turning.
Profile appearance has uneven structure.	Knurling wheel not running smoothly, resulting in distortion.	Remove knurling wheels, clean, grease and re-assemble according to instructions.
Profile is irregular, has pressure marks and is broken away on most of the peaks.	Chips are rolled into the profile.	Watch out for cooling and rinsing! Preferably with high pressure (4)!



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