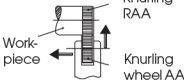
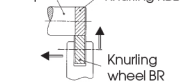
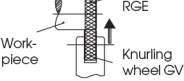
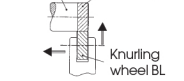
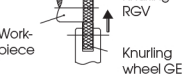
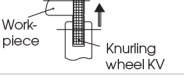
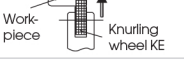


INSTRUCTION MANUAL

zeusECO / Knurling tools 830

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		RBL left-hand knurl	
RGE left/right-hand knurl, raised points, 30°		RBR right-hand knurl	
RGE left/right-hand knurl, lowered points, 30°		RKE cross knurl, raised points, 90°	
		RKV cross knurl, lowered points, 90°	

Tool series 830	
Machining direction	Knurling profiles on workpiece DIN82:        RAA RBL RBR RGE RGV RKE RKV
radial	Selection of knurling wheels: AA BR BL GV GE KV KE
axial/radial and axial	Selection of knurling wheels: AA BR BL - - - -

TOOL SETTING

1. Setting the centre height

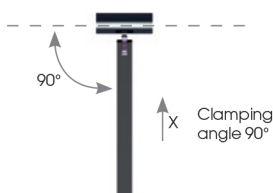
Tool series 830:

Centre height corresponds to centre of the axle pin.

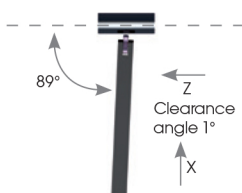


2. Clamping position of tool

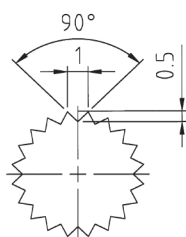
2.1 Radial machining direction



2.2 Radial and axial machining direction



Impression depth:



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.

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.

5. 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.

6. Dwell time during knurling

After reaching the end position (knurl completely formed) the dwell time should not be more than 5–10 revolutions of the workpiece. Run knurling tool free while spindle is turning.

8. 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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