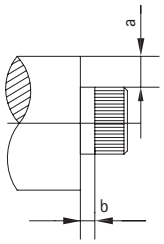
Distance dimension / Clearance groove Cut Knurling

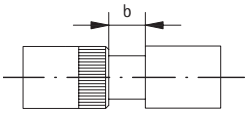
Minimum distance towards work piece shoulder
Due to the inclination of the cut knurling head (30°) and the overhang of the washer, it is not possible to knurl up to a shoulder with a cut knurling tool.

Please adhere to the minimum distance values given in the table
a = increase in shoulder (mm)
b = minimum distance (ø) in mm



Measure "a"	b (10x3x6)	b (15x4x8)	b (25x6x8)	b (42x13x16)
1	2	1,5	2	3
3	2,5	3,5	3	5
5	3	6	5	7
7			8	9
10				12
12				13

Minimum width of groove
In order to start the knurling profile in the middle of the work piece, a groove is required (knurling wheel requires a chamfer for centering).
Minimum depth of groove: ½ pitch +0,3 mm



Dimensions knurling wheel	10x3x6	15x4x8	26x6x8	42x13x6
Minimum width of groove [b]	3 mm	4 mm	6,5 mm	14 mm

Factors influencing profile quality and process rigidity for knurling applications

For a high quality and functionally immaculate knurling profile, there are a number of factors that should be considered and if necessary improved in order to optimize the overall end-result:

Tool characteristics	**Quality and specification of the knurling wheel**	Knurling wheel width		
		Knurling wheel with chamfer		
		Material characteristics	Material of the knurling wheel	
			Hardness of the knurling wheel	
			After-treatment	PVD-coating
				TENIFER®-TREATMENT
		Precision	Truth of running	
			Concentricity	
			Profile characteristics	Sharpness of the tooth tips
				Radius in the tooth depth
				Profile angle
	Type of knurling tool	**Applied knurling technique**	**Form knurling**	Plunge knurling
				Feed knurling
				Plunge and feed knurling
			Cut knurling	
		Quality and condition of the knurling pin / run disk		
		Stability / no vibrations		
		Precision		
Machine characteristics	Precision			
	Stability / no vibrations			
Characteristics of the material processed	Hardness			
	Toughness			
Application specific characteristics	Speed rate	Feed rate		
	Plunge depth	Speed rate		
	Cooling / Lubrication			
	Clearance angle			
	Quality of the gearing	Pre-turning diameter		
		Pitch / Number of teeth		
		Material displacement		