



P R E M I U M

KNURLING  
T O O L S





a brand of Hommel+Keller

# AT THE FOREFRONT!

Tools used in knurling technology always have special requirements with respect to quality, precision, stability and especially technological know-how. For your benefit we are relaunching the time-proven QUICK brand: since 2018 the high-end brand of Hommel+Keller Präzisionswerkzeuge GmbH for exceptionally precise knurling tools. Because here, design is combined with functionality and innovation with experience. QUICK develops, produces and markets knurling tools of first-rate quality and is therefore your specialist for solutions with a profile.

**FORMING AND CUTTING:** The QUICK product spectrum offers innovative solutions for diverse knurling technology applications. For both form knurling and cut knurling tools, QUICK fulfils the most stringent quality standards and masters even difficult tasks with ease.

**TOOLS IN ACTION:** QUICK is used wherever absolute precision and first-rate surface quality are needed. In the automotive sector, for example, in mechanical engineering, in the manufacture of timepieces and in many other industries. Our selection of knurling profiles will impress you – and your customers, too.

**CONVINCING QUALITY:** Precision and premium quality – that is our passion and what motivates us to deliver maximum performance every day. And simultaneously a promise to our customers. Because you are good only if we are. We think ahead, to continuously develop customer-oriented innovations and to find new solutions. Our goal: joint success.

**ANYWHERE IN THE WORLD:** Take advantage of our services: A global sales network and customer proximity, excellent on-site technical support, as well as fast spare parts availability and tool maintenance.

**COMMUNITY:** What makes us special: We not only have excellent technological competence, but also know the needs of our customers very well. For you, that means: Whether in production or processing – at Hommel+Keller you will receive professional service at all times. And you will always find your personal contact person, who will respond to your concerns in a flexible and customer-oriented manner.





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As a global leader in knurling technology Hommel+Keller manufactures products of superior quality based on decades of experience, always with the incentive of continuous improvement. Our premium brand, which can look back on a long and proud history, is custom tailored to the requirements of our customers.



In knurling technology there are two different processes: cut knurling and form knurling.

Both processes have their special applications and areas of utilisation.

Possible knurling profiles on workpiece:



## CUT KNURLING

Cut knurling is a machining process that uses cutting. The material is removed while being supplied at an axial feed rate. This process can therefore also be used for thin-walled or soft materials, as well as hard-to-machine materials.

## ADDED VALUES

- Maximum precision and surface quality, therefore especially suitable for visible knurling
- Knurling of thin-walled workpieces is possible without deformation
- Time savings due to faster cutting speed and feed rate
- Machining of virtually all materials, including grey cast iron and plastic
- Zero or only minimal alteration of the workpiece diameter
- Minimal surface compaction

# CUT KNURLING







# OVERVIEW OF CUT KNURLING TOOLS

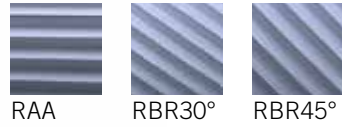
With the product finder for cut knurling tools you can find your desired QUICK product even faster. You receive all relevant tool data, as well as possible profiles, the corresponding knurling wheels and the possible direction of machining at a glance.

Tool series	Workpiece Ø [mm]	Profile on workpiece	Profile on knurling wheel	
 C601 (LA/FL)	1.5 – 12	RAA RBR30° RBR45°	1 x BR30° 1 x AA 1 x BL15°	
 C602 (LA/KF)	1.5 – 12	RGE30° RGE45°	2 x AA 1 x BR15° / 1 x BL15°	
 C611 (A1/FL) (A2/FL)	3 – 50 5 – 250	RAA RBR30° RBL30° RBR45° RBL45°	Right-hand use: 1 x BR30° 1 x AA 1 x BL15°	Left-hand use: 1 x BL30° 1 x AA 1 x BR15°
 C612 (A1/KF) (A2/KF)	3 – 50 5 – 250	RGE30° RGE45°	2 x AA 1 x BR15° / 1 x BL15°	
 C621 (M/FL)	20 – 3000	RAA RBR30° RBR45°	1 x BR30° 1 x AA 1 x BL15°	
 C622 (MI/KF) (MII/KF)	20 – 1000 30 – 3000	RGE30° RGE45°	2 x AA 1 x BR15° / 1 x BL15°	
 C693 (STR-A)	3.5 – 20	RGE30° RGE45°	3 x AA 1 x BR15° / 2 x BL15° or 2 x BR15° / 1 x BL15°	



Shank [mm]	Knurling wheel Ø [mm]	Knurling	 RAA	 RBL	 RBR	 RGE
10 / 12	8.9	Starting at the workpiece Starting after plunge cut	● ●	– –	● ●	– –
10 / 12	8.9	Starting at the workpiece Starting after plunge cut	– –	– –	– –	● ●
10 / 12 / 16 20 / 25	14.5 21.5	Starting at the workpiece Starting after plunge cut	● ●	● ●	● ●	– –
10 / 12 / 16 20 / 25	14.5 21.5	Starting at the workpiece Starting after plunge cut	– –	– –	– –	● ●
27	42	Starting at the workpiece Starting after plunge cut	● ●	– –	● ●	– –
40 57	32 42	Starting at the workpiece Starting after plunge cut	– –	– –	– –	● ●
Ø15 Ø20 Ø25	14.5	Starting at the workpiece Starting after plunge cut	– –	– –	– –	● –

# CUT KNURLING TOOL C601




## ADDED VALUES

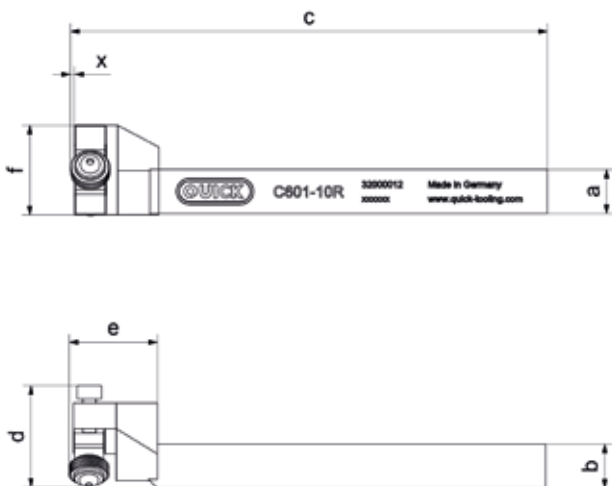
- Developed for minimal installation space and maximum stability
- Designed for smallest workpiece diameters
- User-friendly handling

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000012	C601-10R	1.5 – 12	8.9 x 2.5 x 4	10	10	108	23.5	20	20,3
32000014	C601-12R	1.5 – 12	8.9 x 2.5 x 4	12	12	108	23.5	20	22

Left-hand version of all shank dimensions available on request.

## E-KIT

Order no.	
22BHR0506	



# CUT KNURLING TOOL C602



RGE30°



RGE45°


## ADDED VALUES

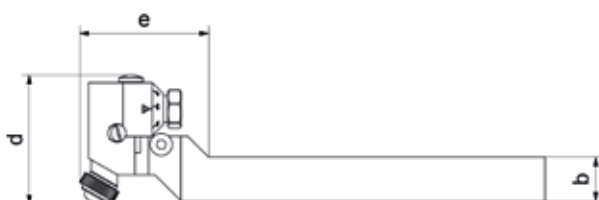
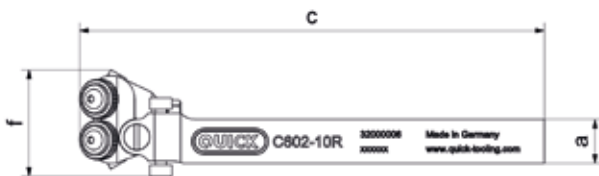
- Developed for minimal installation space and maximum stability
- Designed for smallest workpiece diameters
- Easy fine adjustment of the knurl holder

Bestell-Nr.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000006	C602-10R	1.5 – 12	8.9 x 2.5 x 4	10	10	106	29.7	29.4	24.3
32000008	C602-12R	1.5 – 12	8.9 x 2.5 x 4	12	12	106	29.7	29.4	24.3

Left-hand version of all shank dimensions available on request.

## E-KIT

Order no.	
22BHR0506	



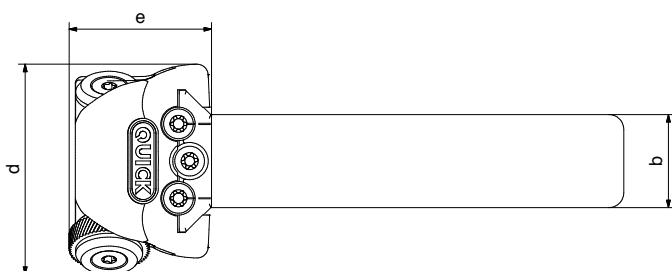
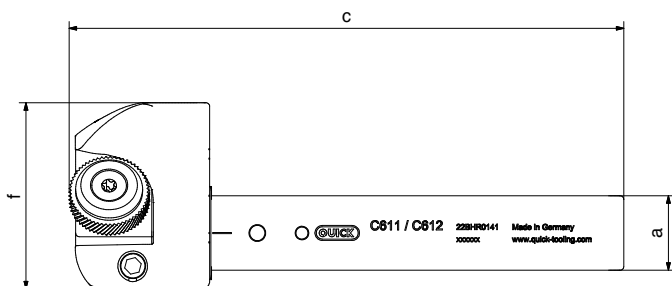
# CUT KNURLING TOOL C611



## ADDED VALUES

- Adaptable, patented QUICK cooling unit
- Multifunctional: For use in front of and behind the rotation centre
- Flexible shank variation
- Head and shank fully exchangeable due to compatible interface

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000037	C611-10M	3 – 50	14.5 x 3 x 5	10	16	106	35	25.6	32
32000038	C611-12M	3 – 50	14.5 x 3 x 5	12	16	106	35	25.6	32
32000039	C611-16M	3 – 50	14.5 x 3 x 5	16	16	106	35	25.6	32
32000043	C611-20M	5 – 250	21.5 x 5 x 8	20	25	149	56.5	38.3	50
32000044	C611-25M	5 – 250	21.5 x 5 x 8	25	25	149	56.5	38.3	50



## E-KIT

Order no.	Knurling wheel (Ø x w x b) [mm]	
22BHR0507	14.5 x 3 x 5	
22BHR0508	21.5 x 5 x 8	

## ADAPTER

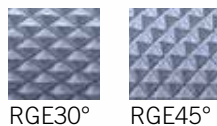
Order no.	Description	
22BHR0152	Adapter 10 x 10	
22BHR0151	Adapter 12 x 12	
22BHR0150	Adapter 16 x 16	

## COOLANT NOZZLE

Order no.	Knurling wheel (Ø x w x b) [mm]	
22BHR0145	14.5 x 3 x 5	
22BHR0136	21.5 x 5 x 8	

The adjustable coolant nozzle ensures the precise supply of coolant to the workpiece and the knurling wheels.

# CUT KNURLING TOOL C612

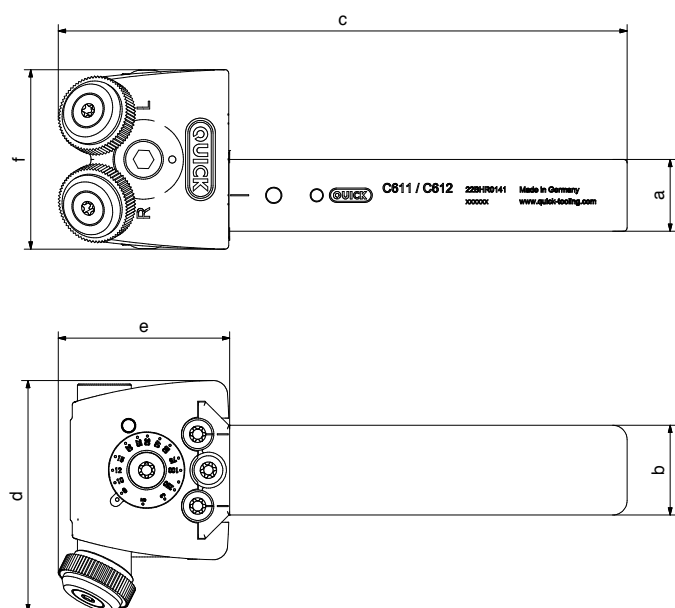


RGE30° RGE45°

## ADDED VALUES


- Adaptable, patented QUICK cooling unit
- Multifunctional: For use in front of and behind the rotation centre
- Flexible shank variation
- Head and shank fully exchangeable due to compatible interface
- Synchronised knurl holder for adjusting the working range

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000034	C612-10M	3 – 50	14.5 x 3 x 5	10	16	115	36	34.7	35.8
32000035	C612-12M	3 – 50	14.5 x 3 x 5	12	16	115	36	34.7	35.8
32000036	C612-16M	3 – 50	14.5 x 3 x 5	16	16	115	36	34.7	35.8
32000041	C612-20M	5 – 250	21.5 x 5 x 8	20	25	158	64.4	47.7	50
32000042	C612-25M	5 – 250	21.5 x 5 x 8	25	25	158	64.4	47.7	50




## E-KIT

Order no.	Knurling wheel (Ø x w x b) [mm]
22BHR0507	14.5 x 3 x 5
22BHR0508	21.5 x 5 x 8




## ADAPTER

Order no.	Description
22BHR0149	Adapter 10 x 10
22BHR0148	Adapter 12 x 12
22BHR0147	Adapter 16 x 16



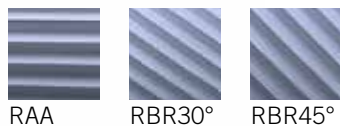
## COOLANT NOZZLE

Order no.	Knurling wheel (Ø x w x b) [mm]
22BHR0145	14.5 x 3 x 5
22BHR0136	21.5 x 5 x 8



The adjustable coolant nozzle ensures the precise supply of coolant to the workpiece and the knurling wheels.

# CUT KNURLING TOOL C621



RAA

RBR30°


RBR45°

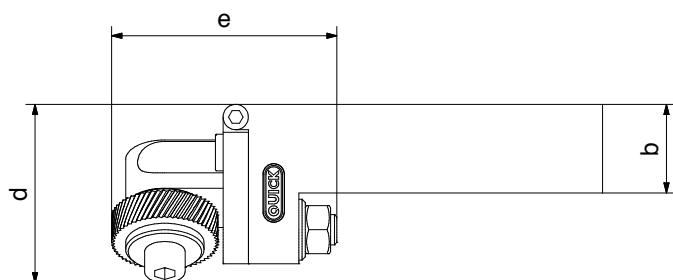
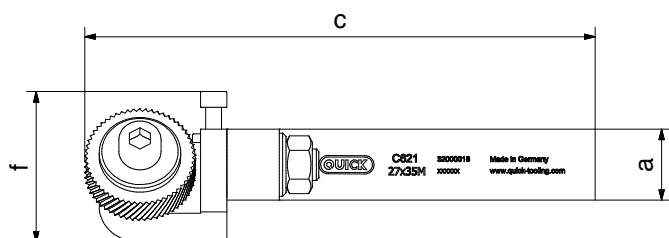
## ADDED VALUES

- Designed for the largest possible working ranges
- Ideal for heavy-duty and roll turning lathes etc.
- Maximum stability due to solid construction

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000018	C621-27R	20 – 3000	42 x 12 x 18	27	35	194	70.5	89	57.2

## E-KIT

Order no.	
22BHR0510	



# CUT KNURLING TOOL C622



RGE30°




RGE45°

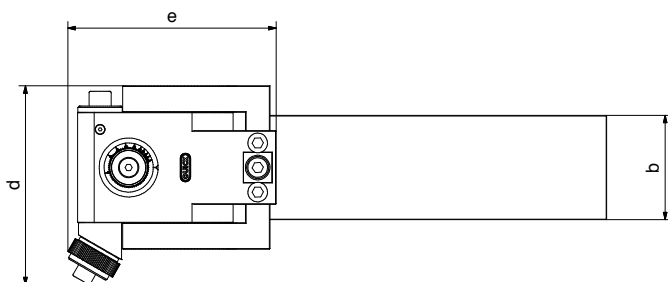
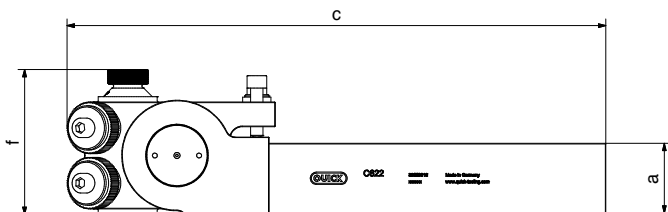
## ADDED VALUES

- Designed for the largest possible working ranges
- Ideal for heavy-duty and roll turning lathes etc.
- Maximum stability due to solid construction
- Synchronised knurl holder for adjusting the working range

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				a	b	c	d	e	f
32000015	C622-40R	20 – 1000	32 x 8 x 14	40	45	275.5	109	115.5	79
32000016	C622-57R	30 – 3000	42 x 12 x 18	57	85	438.5	161.5	169.5	118

## E-KIT

Order no.	Knurling wheel (Ø x w x b) [mm]	
22BHR0509	32 x 8 x 14	
22BHR0511	42 x 12 x 18	



# CUT KNURLING TOOL C693



RGE30°



RGE45°

## ADDED VALUES

- Knurl holders individually adjustable
- Maximum process stability
- All knurling processes can be used by conversion of the knurl holder jaws
- Suitable for very small installation spaces due to compact design

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]					
				d max.	e	j	k	l	n max.
32000030	C693	3.5 – 20	14.5 x 3 x 5	75	57	20	54	20	38

Tool is delivered without shank.


### SHANK

Order no.	Ø „a“ [mm]	Bore „i“ [mm]	Length „h“ [mm]
22BHR0119	15	9	50
22BHR0121	20	10	50
22BHR0122	25	15	50




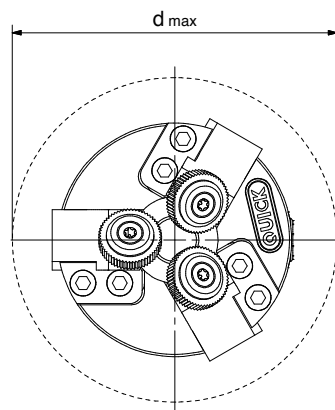
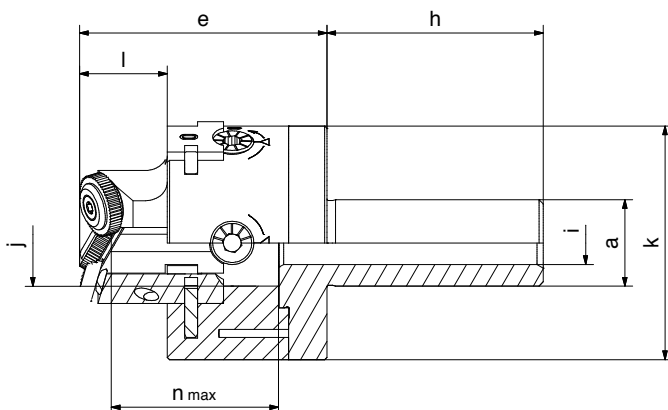
### E-KIT

Order no.
22BHR0507



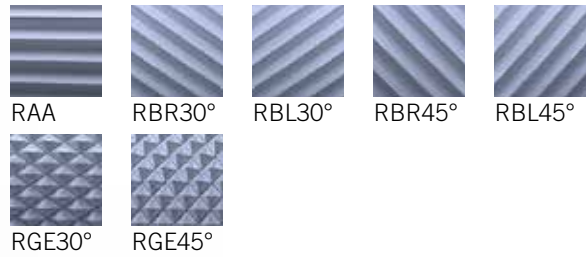
### JAWS

Order no.	Description	Tool
22BHR0490	Form knurling	F791
22BHR0537	Form knurling up to a shoulder	F792



# CUT KNURLING TOOL SET C610



## ADDED VALUES

- All common knurl profiles can be produced
- Maximum user flexibility due to numerous possible combinations of head and shank
- Additional, patented QUICK cooling unit for optimised chip flow


Order no.	Model	Shank [mm]	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]
32000040	C611	10 / 12 / 16	3 – 50	14.5 x 3 x 5
	C612		3 – 50	14.5 x 3 x 5

Coolant nozzle (order no. 22BHR0145) included in set.


Order no.	Model	Shank [mm]	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]
32000045	C611	20 / 25	5 – 250	21.5 x 5 x 8
	C612		5 – 250	21.5 x 5 x 8

Coolant nozzle (order no. 22BHR0145) included in set.

## E-KIT

Order no.	Knurling wheel (Ø x w x b) [mm]	
22BHR0507	14.5 x 3 x 5	
22BHR0508	21.5 x 5 x 8	

## ADAPTER

Order no.	Description	Tool	
22BHR0152	Adapter 10 x 10	C611	
22BHR0151	Adapter 12 x 12	C611	
22BHR0150	Adapter 16 x 16	C611	
22BHR0149	Adapter 10 x 10	C612	
22BHR0148	Adapter 12 x 12	C612	
22BHR0147	Adapter 16 x 16	C612	

In knurling technology there are two different processes: cut knurling and form knurling.

Both processes have their special applications and areas of utilisation.

Possible knurling profiles on the workpiece:



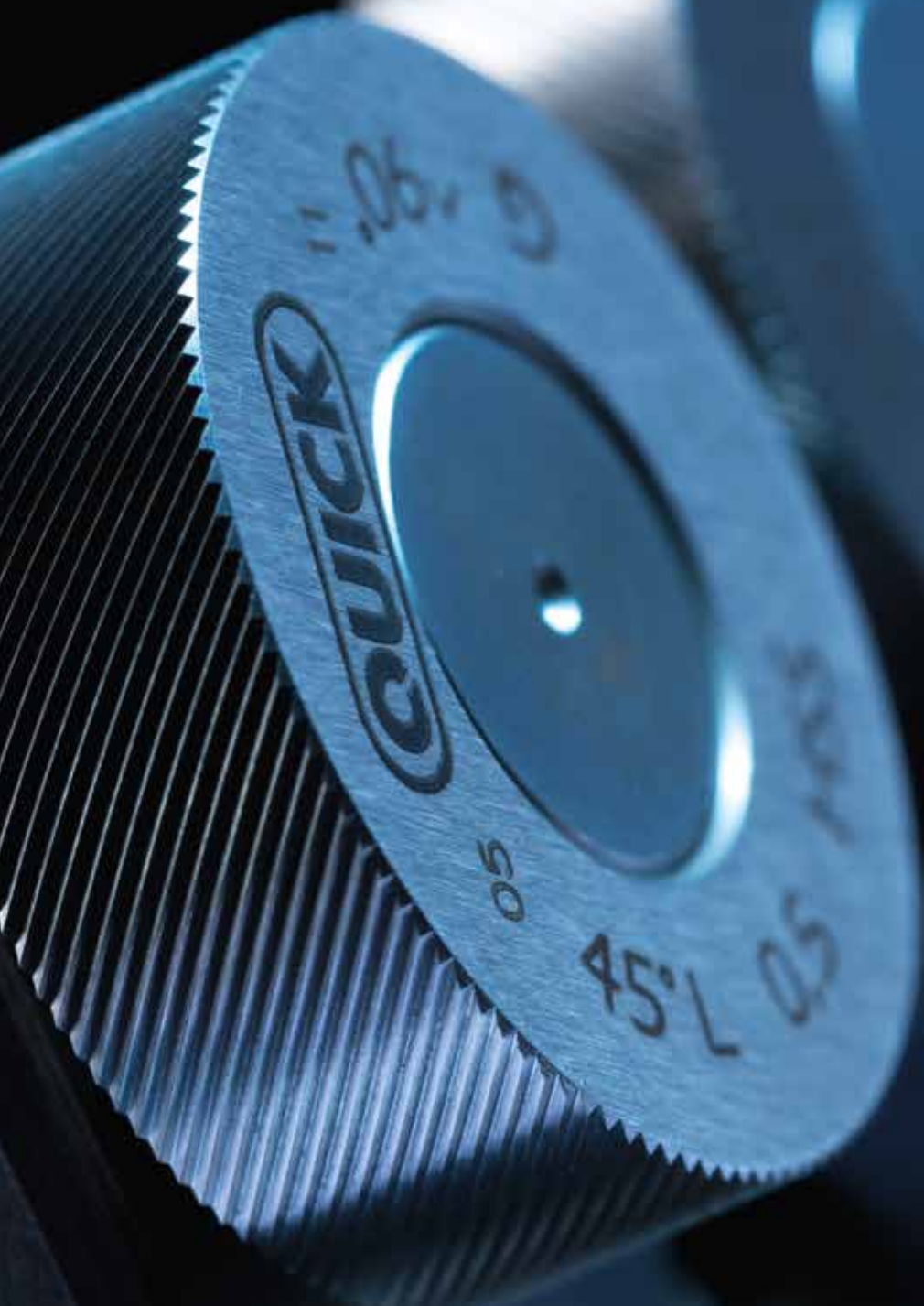
## FORM KNURLING

In form knurling process the surface of the workpiece is formed chipless. Cold forming is used to shape the material, which limits its use to materials that are suitable for cold forming.

## ADDED VALUES

- Machining of the workpiece by cold forming, which compresses the surface of the workpiece
- Knurling is possible all the way to a workpiece shoulder
- All knurling profiles according to DIN 82 can be produced
- Knurling is possible at any position on the workpiece
- Knurling of inner and end faces is possible
- Conical knurling is possible

# FORM KNURLING







# OVERVIEW OF FORM KNURLING TOOLS

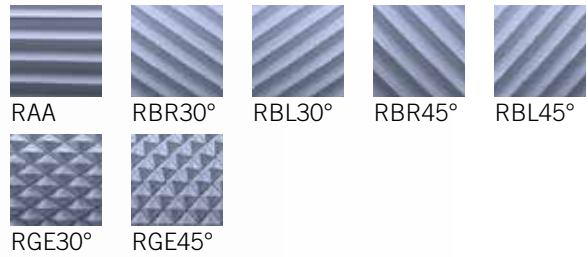
With the product finder for form knurling tools you can find your desired QUICK product even faster. You receive all relevant tool data, as well as possible profiles, the corresponding knurling wheels and the possible direction of machining at a glance.

Tool series	Workpiece Ø [mm]	Profile on workpiece	Profile on knurling wheel	
 <p>F711</p>	<p>2.5 – 24</p> <p>7 – 120</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>Single-wheel:</p> <p>1 x AA</p> <p>1 x BL30°</p> <p>1 x BR30°</p> <p>1 x BL45°</p> <p>1 x BR45°</p>	<p>Double-wheel:</p> <p>2 x AA</p> <p>2 x BL30°</p> <p>2 x BR30°</p> <p>2 x BL45°</p> <p>2 x BR45°</p> <p>1 x BR30°/ 1 x BL30°</p> <p>1 x BR45°/ 1 x BL45°</p>
 <p>F712 (B0)</p>	<p>3.5 – 50</p> <p>7 – 120</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>Single-wheel:</p> <p>1 x AA</p> <p>1 x BL30°</p> <p>1 x BR30°</p> <p>1 x BL45°</p> <p>1 x BR45°</p>	<p>Double-wheel:</p> <p>2 x AA</p> <p>2 x BL30°</p> <p>2 x BR30°</p> <p>2 x BL45°</p> <p>2 x BR45°</p> <p>1 x BR30°/ 1 x BL30°</p> <p>1 x BR45°/ 1 x BL45°</p>
 <p>F751</p>	<p>5 – 20*</p> <p>0 – 15</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>2 x AA</p> <p>2 x BL30°</p> <p>2 x BR30°</p> <p>2 x BL45°</p> <p>2 x BR45°</p> <p>1 x BR30° / 1 x BL30°</p> <p>1 x BR45° / 1 x BL45°</p>	
 <p>F761</p>	<p>10 – 45</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>2 x AA</p> <p>2 x BL30°</p> <p>2 x BR30°</p> <p>2 x BL45°</p> <p>2 x BR45°</p> <p>1 x BR30° / 1 x BL30°</p> <p>1 x BR45° / 1 x BL45°</p>	
 <p>F791</p>	<p>1.8 – 20</p> <p>2.6 – 20</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>3 x AA</p> <p>3 x BL30°</p> <p>3 x BR30°</p> <p>3 x BL45°</p> <p>3 x BR45°</p> <p>1 x BR30° / 2 x BL30° or 1 x BL30° / 2 x BR30°</p> <p>1 x BR45° / 2 x BL45° or 1 x BL45° / 2 x BR45°</p>	
 <p>F792</p>	<p>2.6 – 20</p>	<p>RAA</p> <p>RBR30°</p> <p>RBL30°</p> <p>RBR45°</p> <p>RBL45°</p> <p>RGE30°</p> <p>RGE45°</p>	<p>3 x AA</p> <p>3 x BL30°</p> <p>3 x BR30°</p> <p>3 x BL45°</p> <p>3 x BR45°</p> <p>1 x BR30° / 2 x BL30° or 1 x BL30° / 2 x BR30°</p> <p>1 x BR45° / 2 x BL45° or 1 x BL45° / 2 x BR45°</p>	

\*possibly parameter adjustment is necessary on the machine

Shank [mm]	Knurling wheel Ø [mm]	Knurling				
			RAA	RBL	RBR	RGE
10 / 12	10	Workpiece centre / without plunge cut (radial)	●	●	●	●
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	●	●	●	●
20 / 25	20	Starting in centre of workpiece / without plunge cut	●	●	●	●
		Up to a shoulder	–	–	–	–
		Starting at workpiece beginning up to the collar	–	–	–	–
10 / 12	15	Workpiece centre / without plunge cut (radial)	●	●	●	●
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	●	●	●	●
20 / 25	20	Starting in centre of workpiece / without plunge cut	●	●	●	●
		Up to a shoulder	●	●	●	●
		Starting at workpiece beginning up to the collar	●	●	●	●
12	10	Workpiece centre / without plunge cut (radial)	●	●	●	●
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	●	●	●	●
	15	Starting in centre of workpiece / without plunge cut	●	●	●	●
		Up to a shoulder	–	–	–	–
		Starting at workpiece beginning up to the collar	–	–	–	–
20 / 25	20 / 25	Workpiece centre / without plunge cut (radial)	●	●	●	●
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	●	●	●	●
		Starting in centre of workpiece / without plunge cut	●	●	●	●
		Up to a shoulder	–	–	–	–
		Starting at workpiece beginning up to the collar	–	–	–	–
Ø15 Ø20 Ø25	10	Workpiece centre / without plunge cut (radial)	–	–	–	–
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	–	–	–	–
	15	Starting in centre of workpiece / without plunge cut	–	–	–	–
		Up to a shoulder	–	–	–	–
		Starting at workpiece beginning up to the collar	–	–	–	–
Ø15 Ø20 Ø25	15	Workpiece centre / without plunge cut (radial)	–	–	–	–
		Starting at workpiece beginning	●	●	●	●
		Starting in centre of workpiece / after plunge cut	–	–	–	–
		Starting in centre of workpiece / without plunge cut	–	–	–	–
		Up to a shoulder	–	–	–	–
		Starting at workpiece beginning up to the collar	●	●	●	●

# FORM KNURLING TOOL F711



## ADDED VALUES

- All common knurl profiles can be produced
- Single plus double roller system for maximum flexibility
- Firmly defined centre height
- Adjustment of alignment is possible


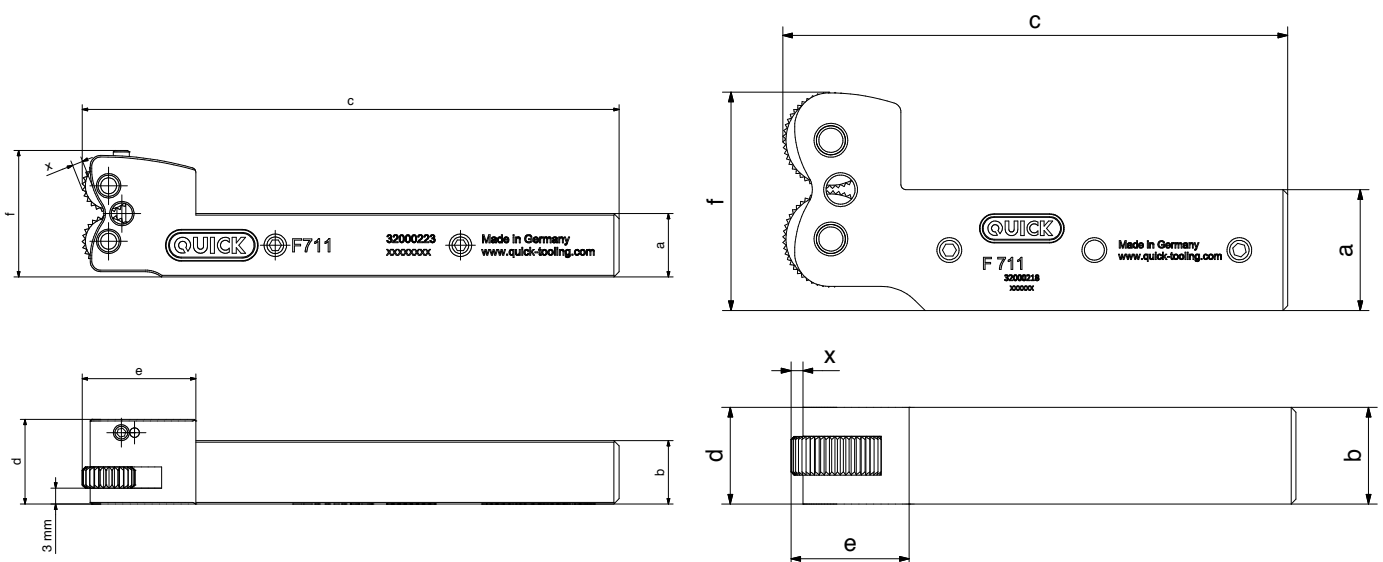
Order no.	Model	Workpiece $\varnothing$ [mm]	Knurling wheel ( $\varnothing \times w \times b$ ) [mm]	Dimensions [mm]						
				a	b	c	d	e	f	x
32000226	F711-10R	2.5 – 24	10 x 4 x 4	10	10	101.5	16.5	21.5	24	2
32000223	F711-12R	2.5 – 24	10 x 4 x 4	12	12	101.5	16.5	21.5	24	2
32000217	F711-20U	7 – 120	20 x 8 x 6	20	20	104.5	20	24.5	40.4	2.5
32000218	F711-25U	7 – 120	20 x 8 x 6	25	20	104.5	20	24.5	45.2	2.5

Left-hand version of shank dimensions 10 and 12 mm available on request.

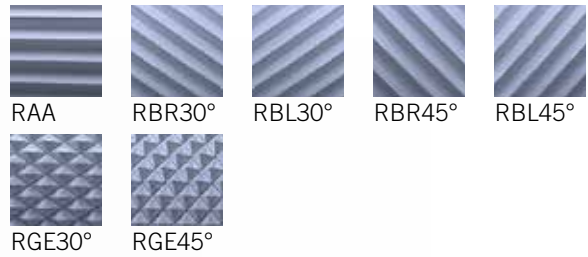
For the **single-wheel** use of this tool (shank size 10 or 12 mm) you may insert a knurling wheels measuring **15 x 4 x 4** mm. The maximum workpiece  $\varnothing$  is then extended to 50 mm.

## SPARE PART

Order no.	Knurling wheel ( $\varnothing \times w \times b$ ) [mm]
06TER1036	10 x 4 x 4
06TER0965	20 x 8 x 6

# FORM KNURLING TOOL F712



## ADDED VALUES


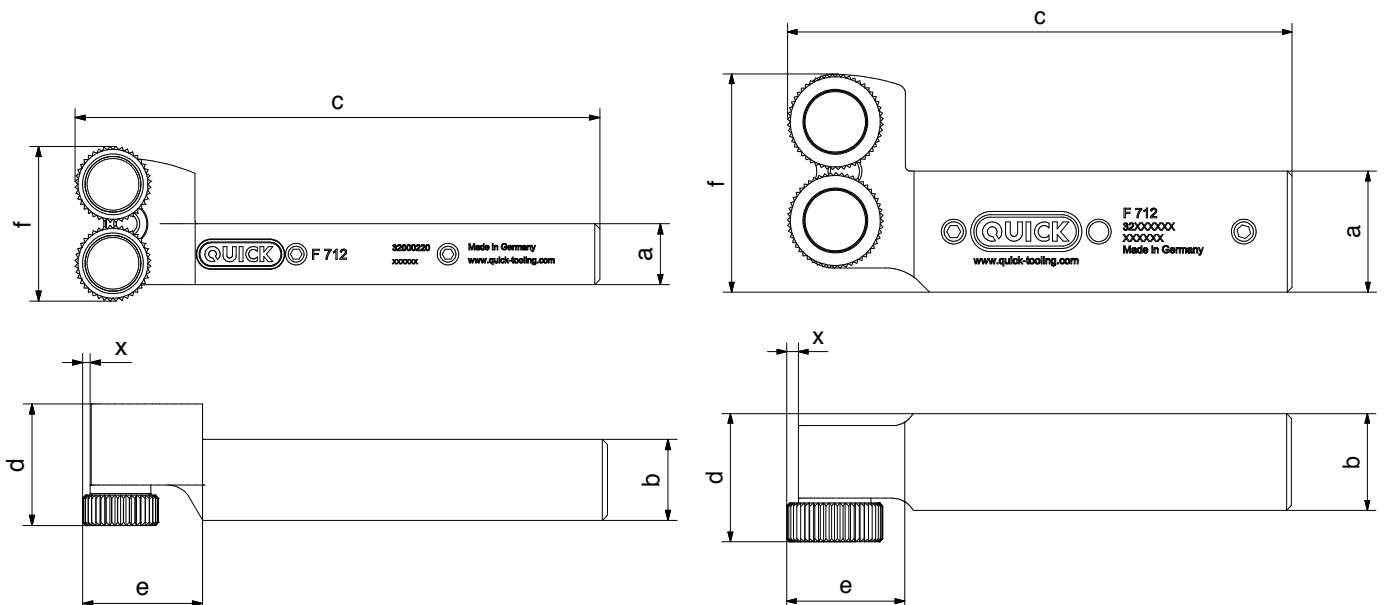
- Knurling up to a shoulder
- All common knurl profiles can be produced
- Single plus double roller system for maximum flexibility
- Firmly defined centre height
- Adjustment of alignment is possible

Order no.	Model	Workpiece $\varnothing$ [mm]	Knurling wheel ( $\varnothing$ x w x b) [mm]	Dimensions [mm]						
				a	b	c	d	e	f	x
32000219	F712-10R	3.5 – 50	15 x 6 x 6A11	10	16	104.5	24	23,7	30.6	1.5
32000220	F712-12R	3.5 – 50	15 x 6 x 6A11	12	16	104.5	24	23,7	30.6	1.5
32000209	F712-20U	7 – 120	20 x 8 x 6A13	20	20	104.5	26.5	24.5	40.4	2.5
32000210	F712-25U	7 – 120	20 x 8 x 6A13	25	20	104.5	26.5	24.5	45.2	2.5

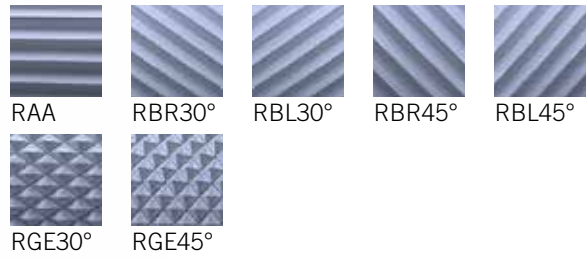
Left-hand version of shank dimensions 10 and 12 mm available on request.

## E-KIT

Order no.	Knurling wheel ( $\varnothing$ x w x b) [mm]
22BHR0548	15 x 6 x 6A11
22BHR0538	20 x 8 x 6A13

# FORM KNURLING TOOL F751



## ADDED VALUES

- High process stability due to tangential machining
- Special design for Swiss-type lathes
- Eliminates double workplace allocation in the slide unit
- User-friendly handling

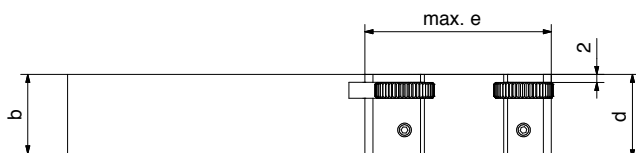
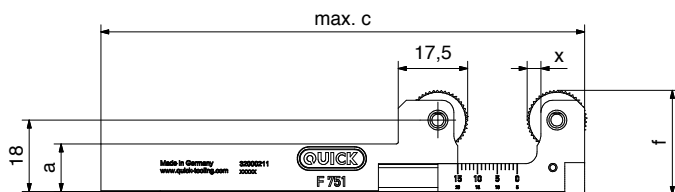
Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]						
				a	b	c	d	e	f	x
32000211	F751-12R	5 – 20*	10 x 4 x 4	12	20	max. 122	21	max. 47	26	1
		0 – 15	15 x 4 x 4							3.5

Left-hand version available on request.

\*possibly parameter adjustment is necessary on the machine

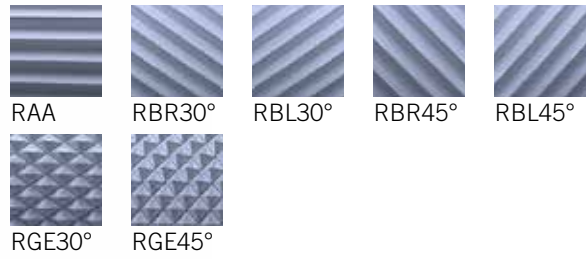
## SPARE PART

Order no.	
06TER0964	





# FORM KNURLING TOOL F761




## ADDED VALUES

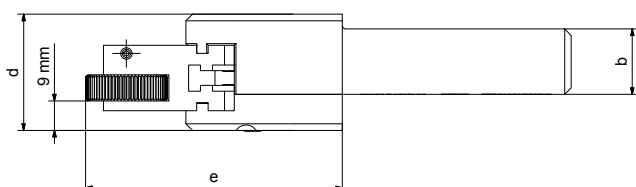
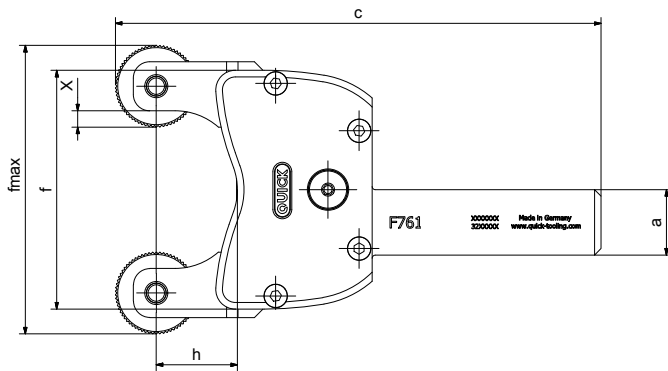
- High process stability due to tangential machining
- Knurl holders can be adjusted via synchronous spindle
- Force neutralisation due to tangential position

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]								
				a	b	c	d	e	f	f max.	h	x
32000221	F761-20R	10 – 45	20 x 8 x 6	20	20	148.5	35.5	78.5	73	94	25	2.5
			25 x 8 x 6									5
32000225	F761-25R	10 – 45	20 x 8 x 6	25	25	148.5	35.5	78.5	73	94	25	2.5
			25 x 8 x 6									5

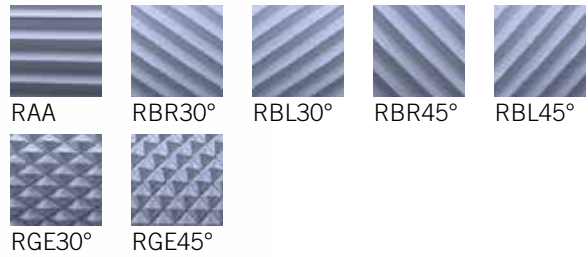
Left-hand version available on request.

## SPARE PART

Order no.	
06TER0965	



# FORM KNURLING TOOL F791



## ADDED VALUES

- Knurl holders individually adjustable
- Maximum process stability
- All knurling processes can be used by exchanging the knurl holder jaws
- Suitable for very small installation spaces due to compact design
- Force reduction due to three-point machining

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]						
				d max.	e	j	k	l	n max.	x
32000072	F791	1.8 – 20	10 x 4 x 4	75	53	20	54	16	32	1
		2.6 – 20	15 x 4 x 4							3.5

Tool is delivered without shank.


### SHANK

Order no.	Ø „a“ [mm]	Bore „i“ [mm]	Length „h“ [mm]
22BHR0119	15	9	50
22BHR0121	20	10	50
22BHR0122	25	15	50



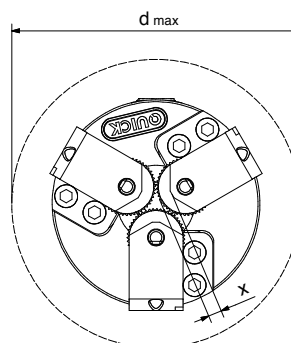
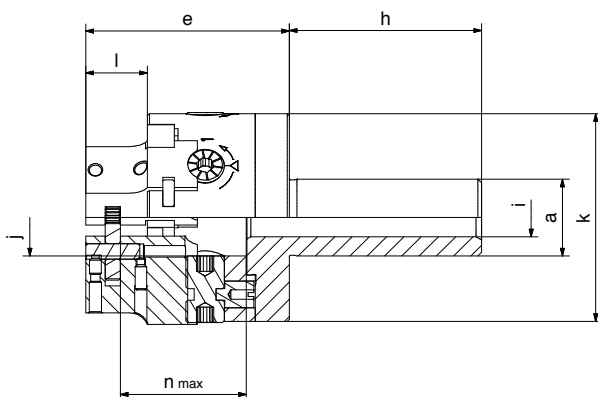
### SPARE PART

Order no.
21BHR1306

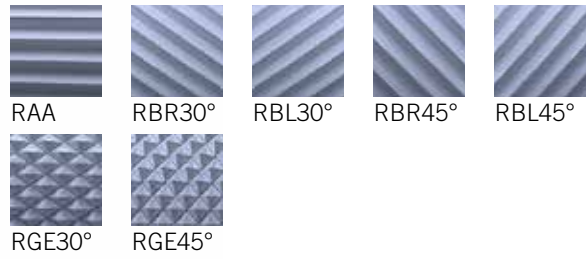


### JAWS

Order no.	Description	Tool
22BHR0537	Form knurling up to a shoulder	F792
22BHR0536	Cut knurling	C693

# FORM KNURLING TOOL F792



## ADDED VALUES

- Knurl holders individually adjustable
- Maximum process stability
- All knurling processes can be used by exchanging the knurl holder jaws
- Suitable for very small installation spaces due to compact design
- Knurling up to a shoulder

Order no.	Model	Workpiece Ø [mm]	Knurling wheel (Ø x w x b) [mm]	Dimensions [mm]						
				d max.	e	j	k	l	n max.	x
32000206	F792	2.6 – 20	15 x 6 x 6A11	75	54	20	54	17	37	1.5

Tool is delivered without shank.

### SHANK

Order no.	Ø „a“ [mm]	Bore „i“ [mm]	Length „h“ [mm]
22BHR0119	15	9	50
22BHR0121	20	10	50
22BHR0122	25	15	50



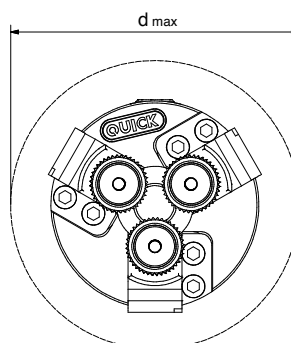
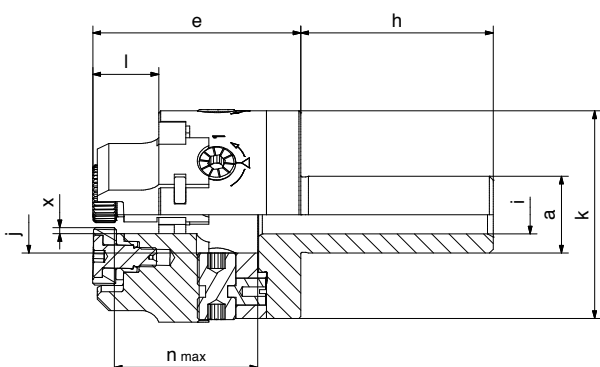
### E-KIT

Order no.
22BHR0548

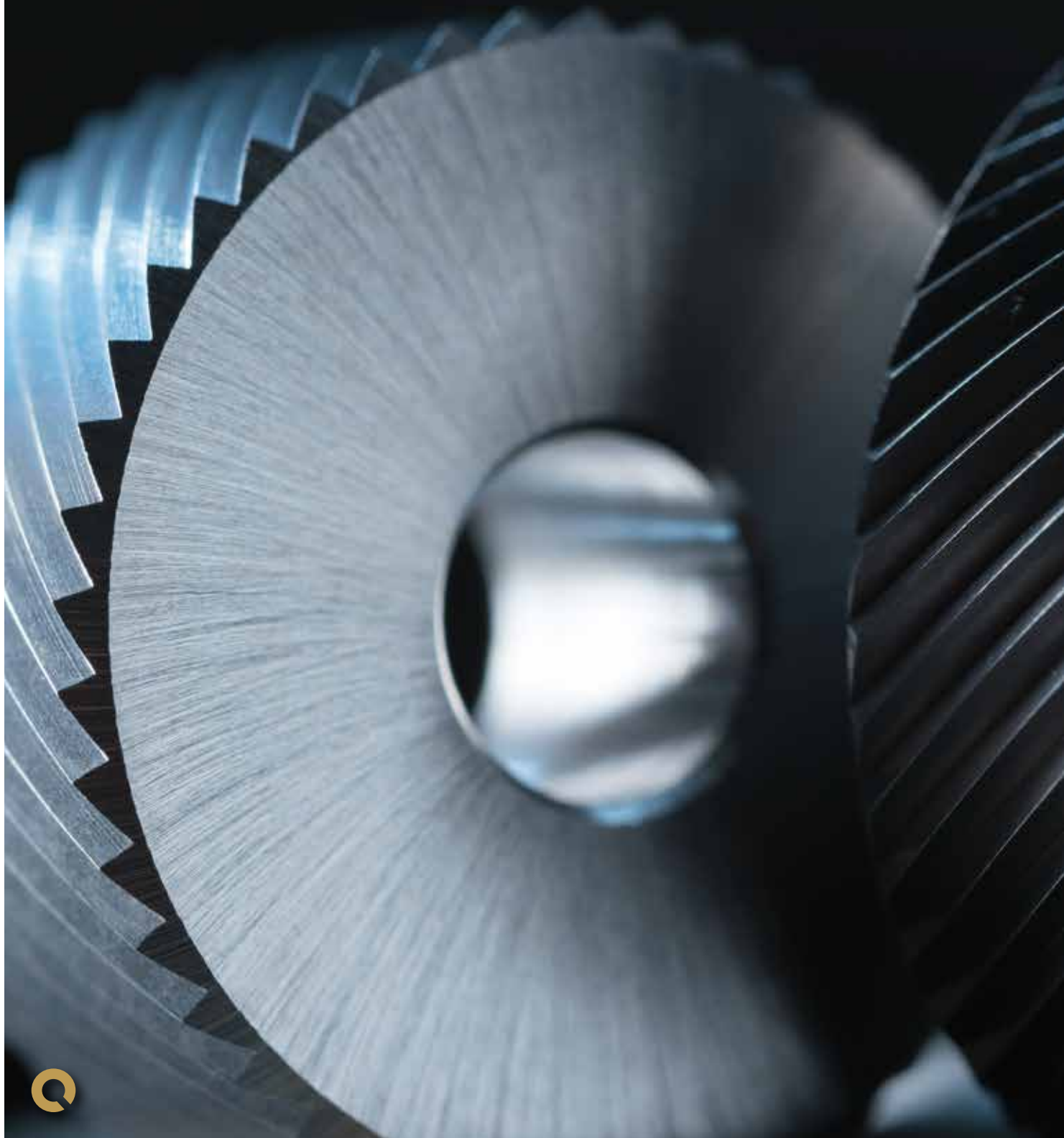


### JAWS

Order no.	Description	Tool
22BHR0490	Form knurling	F791
22BHR0536	Cut knurling	C693



# KNURLING WHEELS






# CUT KNURLING PROCESS

QUICK knurling wheels for cut knurling processes are manufactured of PM.

## Surface treatment PVD coatings

For cut knurling processes we recommend different PVD coatings, since they can have a positive effect on the life of the knurling wheels. The following variants are available on request.

PVD coating	Colour sample	Suitable for
Q-Dur		Cold-work steel/hot-work steel/ high-speed steels/tempering steels (alternative)
Q-Blue		Stainless steels/high-speed steels/tempering steels/ titanium alloys
Q-Gold		Aluminium and brass alloys

# FORM KNURLING PROCESS

QUICK knurling wheels for form knurling processes are manufactured of PM.

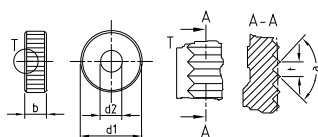
## Surface treatment TENIFER® salt-bath nitriding heat treatment

For form knurling processes we recommend the TENIFER® method, since the salt-bath nitrocarburising process achieves high case hardness.

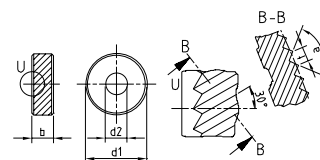
# PROFILES AND PITCHES

DIN 403 describes and specifies the knurling profile on the knurling wheel.  
DIN 403 defines form knurling types AA, BL and BR. Knurling wheels that deviate from DIN 403 are considered special knurling tools and are custom manufactured by Hommel+Keller based on customer drawings.

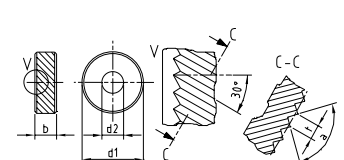
AA | Knurling wheel with axially parallel grooves



BL | Left-hand knurling wheel



BR | Right-hand knurling wheel



The knurling profile on the knurling wheel according to DIN 403 is based on the desired knurling profile on the workpiece (DIN 82) and the toolholder that is used. The knurling pitch prefers to the distance between tooth crests. The pitches = 0.5/0.6/0.8/1.0/1.2/1.6 are standard according to DIN 403. The Hommel+Keller product spectrum includes other pitches as well.

# KNURLING WHEELS FOR CUTTING



AA



BL15°



BR15°



BL30°



BR30°

Ground profile, no chamfer, profile angle 90° – PM

Ø	Dimensions [mm]		Profile	Pitches [mm]
	Width	Bore		
8.9	2.5	4	AA	⊙
			BL15°	□
			BR15°	□
			BL30°	⊙
			BR30°	⊙
14.5	3	5	AA	○
			BL15°	■
			BR15°	■
			BL30°	□
			BR30°	□
21.5	5	8	AA	●
			BL15°	●
			BR15°	●
			BL30°	●
			BR30°	●
32	8	14	AA	◆
			BL15°	◆
			BR15°	◆
42	12	18	AA	◆
			BL15°	◆
			BR15°	◆
			BL30°	❖
			BR30°	❖

## STANDARD PITCHES

●	0.5 / 0.6 / 0.8 / 1.0 / 1.2 / 1.5 / 1.6 / 2.0
○	0.4 / 0.5 / 0.6 / 0.8 / 1.0 / 1.2
⊙	0.3 / 0.4 / 0.5 / 0.6 / 0.8 / 1.0
■	0.5 / 0.6 / 0.8 / 1.0 / 1.2
□	0.4 / 0.5 / 0.6 / 0.8 / 1.0
◆	1.5 / 2.0 / 2.5 / 3.0
❖	1.5 / 2.0 / 3.0

# KNURLING WHEELS FOR FORMING



AA



BL30°



BR30°



BL45°



BR45°

Milled profile, 45° chamfer, profile angle 90° – PM

Ø	Dimensions [mm]		Profile	Pitches [mm]
	Width	Bore		
10	4	4	AA	⊙
			BL30°	⊙
			BR30°	⊙
			BL45°	□
			BR45°	□
15	4	4	AA	⊙
			BL30°	□
			BR30°	□
15	6	6A11	AA	⊙
			BL30°	⊙
			BR30°	⊙
			BL45°	⊙
			BR45°	⊙
20	8	6	AA	●
			BL30°	○
			BR30°	○
			BL45°	■
			BR45°	■
20	8	6A13	AA	○
25	8	6	AA	○

## STANDARD PITCHES

●	0.3 / 0.4 / 0.5 / 0.6 / 0.8 / 1.0 / 1.2 / 1.5 / 2.0
○	0.5 / 0.6 / 0.8 / 1.0 / 1.2 / 1.5
⊙	0.3 / 0.4 / 0.5 / 0.6 / 0.8 / 1.0
■	0.6 / 0.8 / 1.0 / 1.2 / 1.5 / 2.0
□	0.5 / 0.6 / 0.8 / 1.0

# TECHNOLOGY

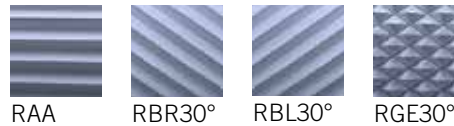




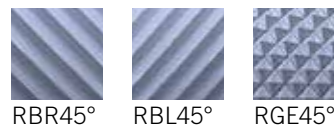
# IMPORTANT INFORMATION

## KNURLING PROFILES

Knurling profiles according to DIN 82



Additional profiles



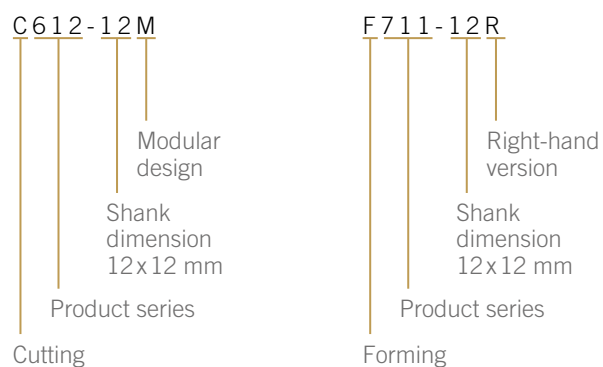
## DOVETAIL GUIDE

- Modular shank design: Shank can be exchanged quickly and easily by means of the dovetail guide
  1. Shank sizes 10 x 16 / 12 x 16 / 16 x 16 mm are suitable for the small knurling head
  2. Shank sizes 20 x 25 / 25 x 25 mm are suitable for the large knurling head
- Eccentric clamping
- For shank sizes 10 x 16 / 12 x 16 / 16 x 16 mm and 20 x 25 / 25 x 25 mm there is an adaptable coolant nozzle

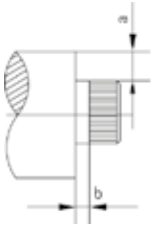


## EXPLANATION OF MODEL DESIGNATIONS

Each QUICK tool has a particular designation.  
The following explanation is provided for your convenience.



# INFLUENCING FACTORS



## ■ Clearance dimension for cut knurling – workpiece collar

Due to the design-related inclination (30°) of the knurling head and the overhang of the cover plate, knurling up to a collar is not possible with a cut knurling tool.

Dimension a corresponds to the increase in the step (mm).  
Dimension b corresponds to the minimum clearance for the respective knurling wheel ( $\varnothing$  specified in mm).

Dimension a is calculated with shoulder-height and 1/2 pisch with a flank angle of 90°.

a	b 8.9	b 14.5	b 21.5	b 32	b 42
1	1.0	1.3	2.0	1.5	1.8
2	2.5	1.8	2.6	2.5	3.0
3	3.0	2.2	3.0	3.1	4.3
4	3.0	2.6	3.8	3.8	5.7
5	3.0	2.8	4.5	4.5	6.7
6	3.0	3.1	4.7	5.1	7.5
7	3.0	3.1	5.0	6.2	8.1
8	3.0	3.1	5.3	7.6	8.6
9	3.0	3.1	5.3	9.4	9.1
10	3.0	3.1	5.3	9.8	9.5
11	3.0	3.1	5.3	10.4	9.8
12	3.0	3.1	5.3	10.6	10.1
13	3.0	3.1	5.3	10.8	12.2
14	3.0	3.1	5.3	11.1	13.1
15	3.0	3.1	5.3	11.1	13.6
16	3.0	3.1	5.3	11.1	14.1
17	3.0	3.1	5.3	11.1	14.4
18	3.0	3.1	5.3	11.1	14.6
19	3.0	3.1	5.3	11.1	14.8

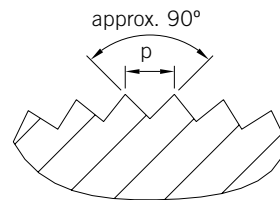
Dimension a = shoulder-height + 1/2 pisch (flank angle 90°)

# OPTIMISATION OF KNURLING

To guarantee optimal results, we recommend that you read the operating manual carefully before using our products. Correct assembly and handling of the tool will save you set-up time and allow you to achieve your desired results.

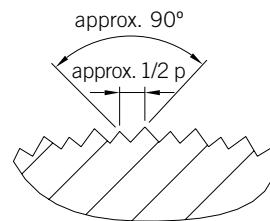
## The pitch corresponds to the workpiece circumference

In many cases the user does not notice the relationship between the pitch and the workpiece circumference. The knurling wheel can compensate the distortion of the pitch to produce optimal knurling results (see figure).



## The pitch does not correspond to the workpiece circumference at all, or is not optimal

This is an extreme case. The knurling wheel cannot compensate the unfavourable relationship between the pitch and the workpiece circumference, or the profile is heavily distorted. In the worst case this can result in “double knurling”. This happens when the knurling wheel does not engage in the knurling profile after one workpiece rotation, but instead engages in between. This is evident in the finer pitch of the knurling (see figure).



**The knurling quality and the tool life can be improved substantially by optimising the knurling by changing the rough-turn diameter, the cutting values and/or the pitch.**

### 1. Correction of the rough-turn diameter and the cutting values until optimal knurling is achieved.

If a correction is not possible due to inability to comply with the tolerances, then:

### 2. Check whether the pitch can be changed.

If it is not possible to change the pitch, it is necessary to manufacture a special knurling wheel with optimised pitch (defined number of teeth/outer diameter of knurling wheel).

Consultation is provided by the Hommel+Keller application engineer on the basis of a workpiece drawing and information about the machine.

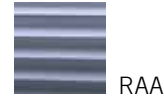
The calculation of the optimal pitch is conducted on the basis of approximate formulas. Due to influencing factors (such as differences in materials) further optimisation may be necessary.

# MATERIAL DISPLACEMENT IN FORM KNURLING PROCESS

Our empirical values for enlargement of the workpiece diameter

Knurling profile acc. to DIN 82: RAA (knurling profile on the workpiece)

Knurling wheels acc. to DIN 403: AA (knurling profile on knurling wheel)



Material	Workpiece Ø [mm]	Pitch [mm]										
		0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.5	1.6	2.0
		Enlargement of workpiece diameter [mm]										
Free-cutting steel	5	0.08	0.14	0.18	0.22	0.27	0.29	0.35	0.50	–	–	–
	15	0.08	0.14	0.18	0.23	0.30	0.40	0.44	0.50	0.60	0.65	0.70
	25	0.08	0.15	0.23	0.24	0.28	0.35	0.44	0.53	0.62	0.70	0.98
Stainless steel	5	0.10	0.15	0.20	0.25	0.28	0.30	0.42	0.41	–	–	–
	15	0.10	0.15	0.19	0.25	0.30	0.34	0.45	0.51	0.60	–	–
	25	0.10	0.14	0.20	0.26	0.31	0.33	0.43	0.50	0.62	–	–
Brass	5	0.08	0.12	0.18	0.20	0.21	0.22	0.25	0.28	–	–	–
	15	0.10	0.14	0.20	0.26	0.28	0.29	0.35	0.41	0.44	0.48	0.55
	25	0.10	0.15	0.20	0.25	0.28	0.30	0.36	0.43	0.46	0.50	0.53
Aluminium	5	0.09	0.15	0.19	0.23	0.28	0.30	0.41	0.40	–	–	–
	15	0.10	0.15	0.19	0.26	0.29	0.33	0.45	0.51	0.57	0.65	–
	25	0.09	0.15	0.19	0.26	0.29	0.32	0.45	0.52	0.59	0.65	0.75

Important notice: This information represents empirical values. Deviations are possible.

Knurling profile acc. to DIN 82: RBL30°/RBR30° (knurling profile on workpiece)

Knurling wheels acc. to DIN 403: BR30°/BL30° (knurling profile on knurling wheel)



Material	Workpiece Ø [mm]	Pitch [mm]										
		0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.5	1.6	2.0
		Enlargement of workpiece diameter [mm]										
Free-cutting steel	5	0.11	0.15	0.20	0.24	0.28	0.34	0.45	0.55	–	–	–
	15	0.11	0.15	0.22	0.26	0.30	0.35	0.45	0.52	0.67	0.73	0.85
	25	0.11	0.14	0.23	0.25	0.28	0.36	0.45	0.56	0.70	0.72	0.90
Stainless steel	5	0.09	0.14	0.19	0.25	0.31	0.34	0.45	0.52	–	–	–
	15	0.12	0.20	0.23	0.31	0.35	0.40	0.51	0.62	0.66	0.73	0.97
	25	0.12	0.18	0.24	0.27	0.37	0.39	0.49	0.59	0.80	0.84	0.96
Brass	5	0.10	0.14	0.20	0.23	0.24	0.28	0.33	0.37	–	–	–
	15	0.10	0.15	0.21	0.23	0.24	0.31	0.41	0.47	0.53	0.55	0.63
	25	0.11	0.15	0.22	0.22	0.25	0.30	0.40	0.45	0.55	0.61	0.68
Aluminium	5	0.12	0.14	0.21	0.24	0.29	0.34	0.41	0.51	–	–	–
	15	0.12	0.18	0.23	0.26	0.36	0.40	0.50	0.56	0.56	0.61	0.75
	25	0.12	0.18	0.25	0.28	0.37	0.39	0.50	0.58	0.77	0.82	0.96

36 Important notice: This information represents empirical values. Deviations are possible.

Knurling profile acc. to DIN 82: RGE30° (knurling profile on the workpiece)

Knurling wheels acc. to DIN 403: BR30°+ BL30° (knurling profile on knurling wheel)



RGE30°

Material	Workpiece Ø [mm]	Pitch [mm]										
		0.3	0.4	0.5	0.6	0.7	0.8	1.0	1.2	1.5	1.6	2.0
		Enlargement of workpiece diameter [mm]										
Free-cutting steel	5	0.12	0.16	0.20	0.25	0.33	0.41	0.55	0.65	–	–	–
	15	0.13	0.22	0.30	0.32	0.35	0.41	0.52	0.62	0.67	0.81	0.95
	25	0.12	0.18	0.28	0.32	0.35	0.38	0.55	0.67	0.77	0.87	0.98
Stainless steel	5	0.11	0.20	0.25	0.30	0.36	0.39	0.55	0.55	–	–	–
	15	0.10	0.14	0.21	0.24	0.29	0.34	0.43	0.53	0.66	0.72	0.88
	25	0.11	0.13	0.20	0.25	0.28	0.32	0.44	0.52	0.67	0.70	0.83
Brass	5	0.12	0.13	0.16	0.20	0.24	0.28	0.32	0.38	–	–	–
	15	0.12	0.16	0.18	0.24	0.28	0.30	0.39	0.40	0.48	0.52	0.63
	25	0.12	0.17	0.22	0.23	0.27	0.30	0.38	0.41	0.48	0.50	0.63
Aluminium	5	0.10	0.15	0.21	0.25	0.33	0.36	0.50	0.57	–	–	–
	15	0.11	0.14	0.20	0.25	0.28	0.33	0.43	0.54	0.67	0.71	0.89
	25	0.11	0.15	0.22	0.25	0.29	0.34	0.44	0.53	0.68	0.69	0.88

Important notice: This information represents empirical values. Deviations are possible.

# GUIDELINES FOR CUTTING SPEED AND FEED RATE

Cut knurling process

Material	Workpiece Ø [mm]	Knurling wheel Ø [mm]	Vc [m/min]		f [mm/U]					
					Radial		Axial			
			from	to			Pitch [mm]			
					> 0.3 < 0.5	> 0.5 < 1.0	> 1.0 < 1.5	> 1.5 < 2.0		
Free-cutting steel	< 10	8.9 / 14.5 / 21.5	40	70	0.04	0.08	0.20	0.13	0.08	0.07
	10 – 40	8.9 / 14.5 / 21.5 / 32 / 42	50	90	0.05	0.10	0.28	0.18	0.14	0.10
	40 – 100	14.5 / 21.5 / 32 / 42	65	110	0.05	0.10	0.35	0.25	0.17	0.11
	100 – 250	21.5 / 32 / 42	65	110	0.05	0.10	0.42	0.28	0.18	0.13
	> 250	32 / 42	80	100	0.05	0.10	0.45	0.29	0.20	0.14
Stainless steel	< 10	8.9 / 14.5 / 21.5	22	40	0.04	0.08	0.14	0.09	0.06	0.05
	10 – 40	8.9 / 14.5 / 21.5 / 32 / 42	30	50	0.05	0.10	0.20	0.13	0.10	0.07
	40 – 100	14.5 / 21.5 / 32 / 42	35	60	0.05	0.10	0.25	0.18	0.12	0.08
	100 – 250	21.5 / 32 / 42	35	60	0.05	0.10	0.29	0.20	0.13	0.09
	> 250	32 / 42	45	55	0.05	0.10	0.31	0.21	0.14	0.10
Brass	< 10	8.9 / 14.5 / 21.5	55	100	0.04	0.08	0.22	0.14	0.09	0.08
	10 – 40	8.9 / 14.5 / 21.5 / 32 / 42	70	125	0.05	0.10	0.31	0.20	0.15	0.11
	40 – 100	14.5 / 21.5 / 32 / 42	90	155	0.05	0.10	0.39	0.28	0.18	0.12
	100 – 250	21.5 / 32 / 42	90	155	0.05	0.10	0.46	0.31	0.20	0.14
	> 250	32 / 42	115	140	0.05	0.10	0.49	0.32	0.22	0.15
Aluminium	< 10	8.9 / 14.5 / 21.5	70	120	0.04	0.08	0.12	0.08	0.05	0.04
	10 – 40	8.9 / 14.5 / 21.5 / 32 / 42	80	150	0.05	0.10	0.17	0.11	0.08	0.06
	40 – 100	14.5 / 21.5 / 32 / 42	110	160	0.05	0.10	0.21	0.15	0.10	0.07
	100 – 250	21.5 / 32 / 42	110	160	0.05	0.10	0.25	0.17	0.11	0.08
	> 250	32 / 42	130	150	0.05	0.10	0.27	0.18	0.12	0.08

Important notice: This information represents reference values. The optimal values are to be found in the application. Ensure effective cooling/lubrication to prevent chips from being rolled into the profile and to prolong the life of the knurling wheels.

Form knurling process

Material	Workpiece Ø [mm]	Knurling wheel Ø [mm]	Vc [m/min]		f [mm/U]					
					Radial		Axial			
			from	to			Pitch [mm]			
					from	to	> 0.3 < 0.5	> 0.5 < 1.0	> 1.0 < 1.5	> 1.5 < 2.0
Free-cutting steel	< 10	10 / 15 / 20	20	50	0.04	0.08	0.14	0.09	0.06	0.05
	10 – 40	10 / 15 / 20 / 25	25	55	0.05	0.10	0.20	0.13	0.10	0.07
	40 – 100	15 / 20 / 25	30	60	0.05	0.10	0.25	0.18	0.12	0.08
	100 – 250	20 / 25	30	60	0.05	0.10	0.30	0.20	0.13	0.09
Stainless steel	< 10	10 / 15 / 20	15	40	0.04	0.08	0.12	0.08	0.05	0.04
	10 – 40	10 / 15 / 20 / 25	20	50	0.05	0.10	0.17	0.11	0.09	0.06
	40 – 100	15 / 20 / 25	25	50	0.05	0.10	0.21	0.15	0.10	0.07
	100 – 250	20 / 25	25	50	0.05	0.10	0.26	0.17	0.11	0.08
Brass	< 10	10 / 15 / 20	30	75	0.04	0.08	0.15	0.09	0.06	0.05
	10 – 40	10 / 15 / 20 / 25	40	85	0.05	0.10	0.21	0.14	0.11	0.07
	40 – 100	15 / 20 / 25	45	90	0.05	0.10	0.26	0.19	0.13	0.08
	100 – 250	20 / 25	45	90	0.05	0.10	0.32	0.21	0.14	0.09
Aluminium	< 10	10 / 15 / 20	25	60	0.04	0.08	0.18	0.11	0.08	0.06
	10 – 40	10 / 15 / 20 / 25	30	65	0.05	0.10	0.25	0.16	0.13	0.09
	40 – 100	15 / 20 / 25	35	70	0.05	0.10	0.31	0.23	0.15	0.10
	100 – 250	20 / 25	35	70	0.05	0.10	0.38	0.25	0.16	0.11

Important notice: This information represents reference values. The optimal values are to be found in the application. Ensure effective cooling/lubrication to prevent chips from being rolled into the profile and to prolong the life of the knurling wheels.



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