IFANGER
THE CUTTING TOOL THAT KEEPS YOU AHEAD

Swiss-Knurl

Knurling tools
Pitch starting at 0.1 mm

KN-EN-3.1b

SWISS MADE
QUALITY SINCE 1917

Table of Contents

Technical Notes

Swiss Tools
History and values 4

Swiss-Knurl System
For Swiss-type lathes and more 5

Tool Selection
Knurling by deformation 6
Knurling by cutting 8

Material
Knurling rolls materials and coatings 10

Reference Values
Knurling by deformation 12
Diameter expansion 13
Knurling by cutting 14

General Notes
Knurling by pressure 62
Knurling by cutting 64

Standards
DIN 82, ISO 13444, UNI 149 66
CP, DP (imperial) 67

Guidelines for designers 68



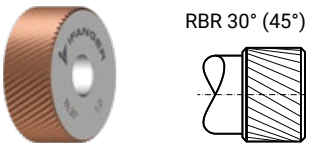
Swiss-Knurl knurling rolls

Knurling by deformation

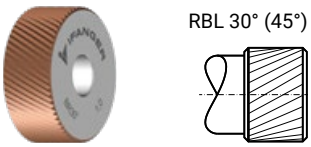
RDAA 16 — RAA



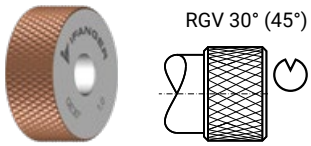
RDBL 18 — RBR 30° (45°)



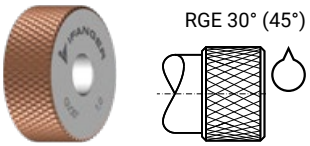
RDBR 20 — RBL 30° (45°)



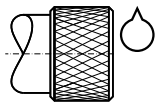
RDGE 22 — RGV 30° (45°)



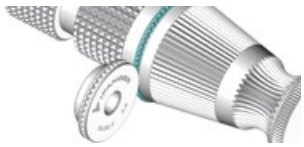
RDGV 24 — RGE 30° (45°)



RDBL + RDBR 28 — RGE 30° (45°)

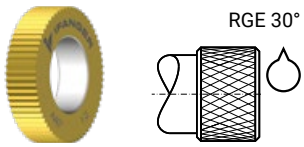


Spezialrollen 32

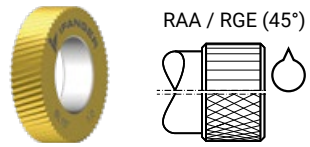


Knurling by cutting

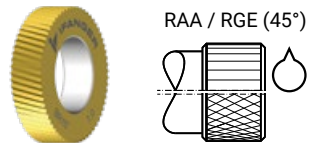
RFAA 26 — RGE 30°



RFBL 28 — RAA / RGE (45°)



RFBR 30 — RAA / RGE (45°)



Swiss-Knurl holder

1 ROLL 34
RASN, RCSR, RSCL



2 ROLLS 38
RCDL, RCDR, RVDR



CUSTOMIZED SOLUTIONS 54

1 ROLL 44
RZSR, RZSL



2 ROLLS 48
RKDR, RKDL



3 ROLLS 52
RRTN

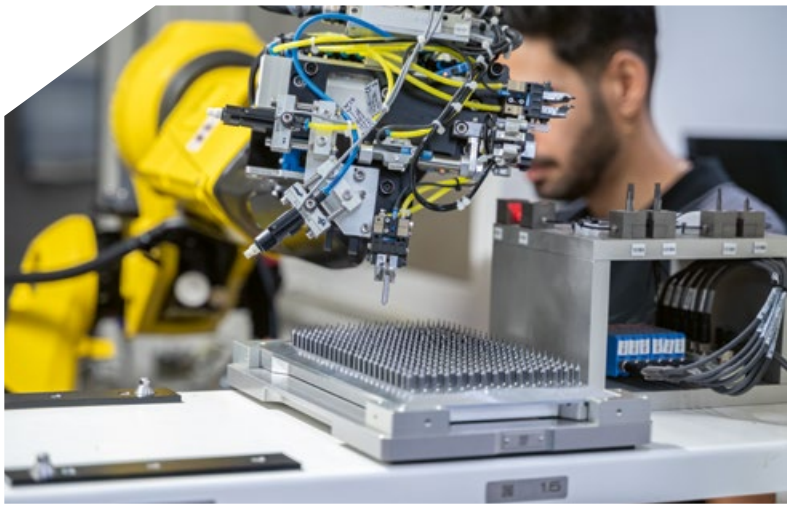


Swiss Tools

History and values

As a "Swiss-made product," Swiss-Knurl represents quality and reliability. The IFANGER team's relentless commitment pushes the boundaries of innovation and exceeds quality and performance standards.

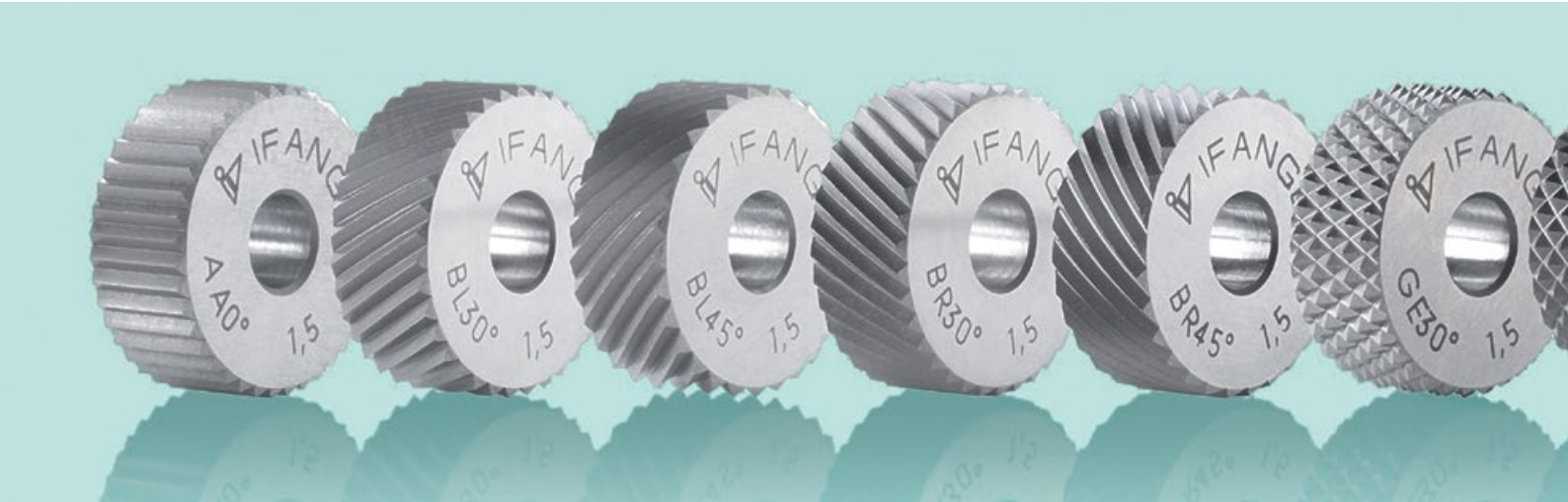
IFANGER developed the "Swiss-Knurl" tool family based on this fundamental approach. These tools have been consistently developed and perfected under the Swiss Made label for decades. The invention of the "Swiss-type automatic lathe", an internationally recognized term, is attributed to the watchmaker Jakob Schweizer in 1872. This technology embodies all aspects of the Swiss manufacturing industry.





In 1917, tool pioneer Eduard Ifanger laid the foundation for the company's success with the launch of its modular, resharpenable turning tools. To this day, the family-run company strives to develop tool concepts with a "technological edge."

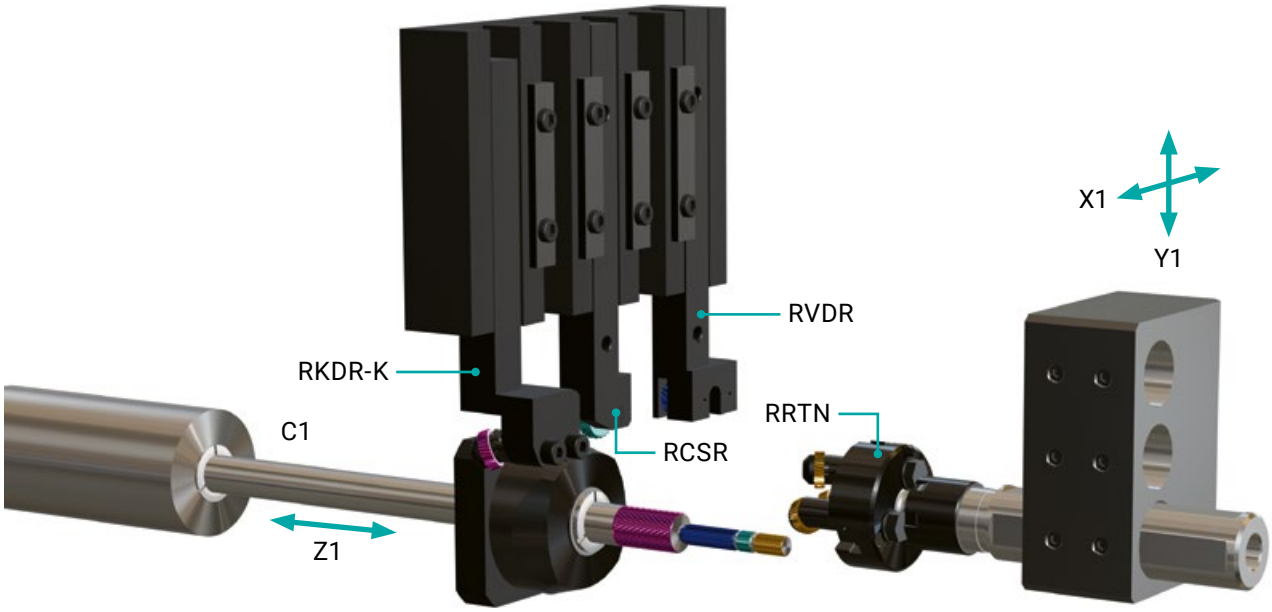
Development and production are carried out entirely in Switzerland to the highest quality standards.

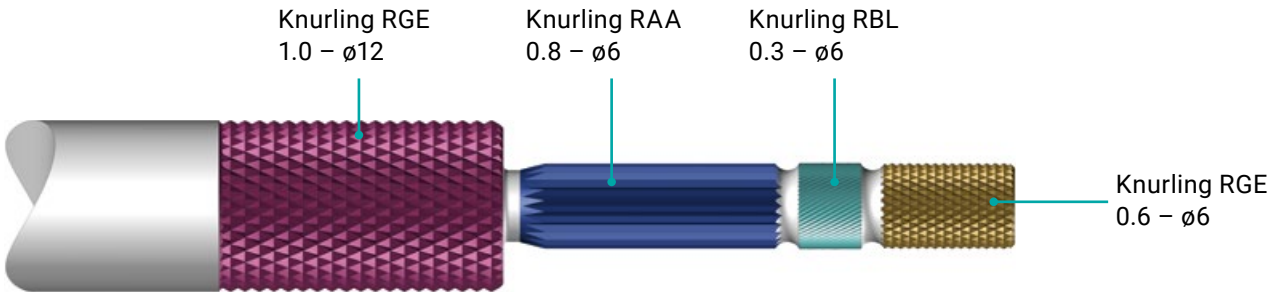


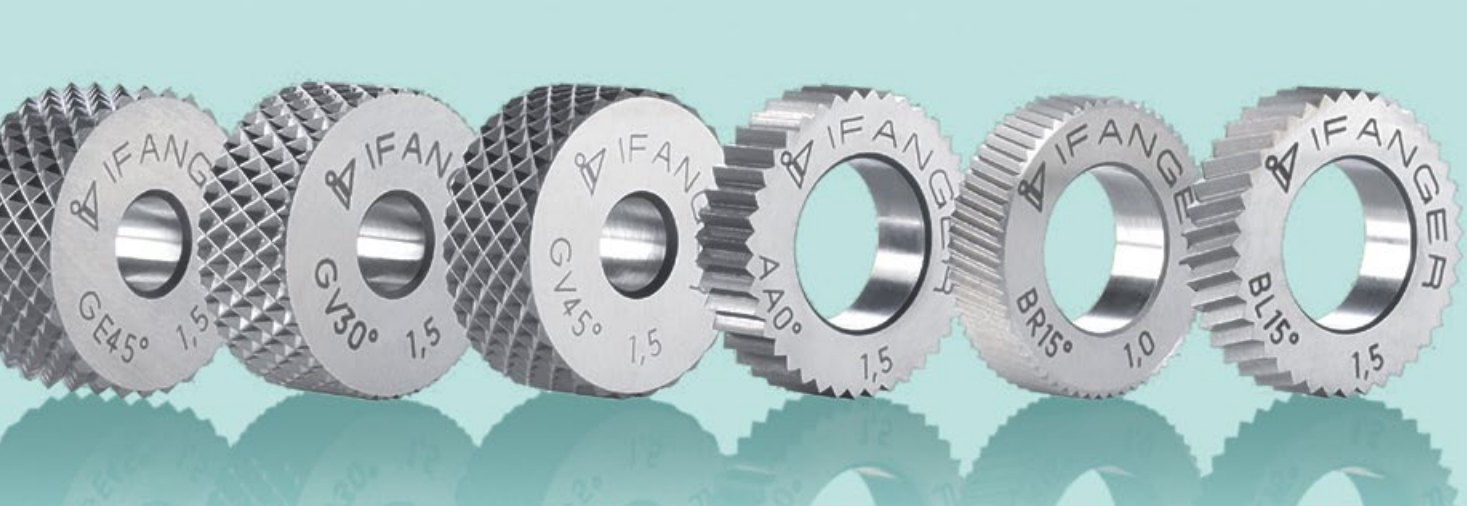
Swiss-Knurl System

For Swiss-type lathes and more

Swiss-Knurl tools are specially designed for the high-performance production of knurled parts starting with a diameter of 0.5 mm and knurl pitches of 0.1 mm on Swiss-type lathes. They have proven themselves millions of times over. They impress with their maximum precision, exceptional reliability, and cost-effectiveness. The tool range also includes high-performance solutions for the production of knurled profiles on CNC and conventional machines.







Tool selection

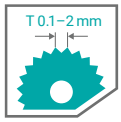
Knurling by deformation

KNURLING BY DEFORMATION «RD»

Criteria

- Pitches starting at 0.1 mm
- Knurl widths of less than 1 mm possible
- Knurl diameter starting at 0.5 mm
- Reliable and cost-efficient process
- Leads to an increase of the workpiece diameter
- Surface hardening through cold forming
- Suitable only for deformable metals

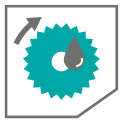
Knurling is a forming process in which the pattern is impressed into the surface. The knurling roll is pressed onto the rotating workpiece, plastically deforming the material and creating the desired profile. This process is well suited to softer materials and particularly economical, as no material is lost.



BIG CHOICES OF PITCHES (T)



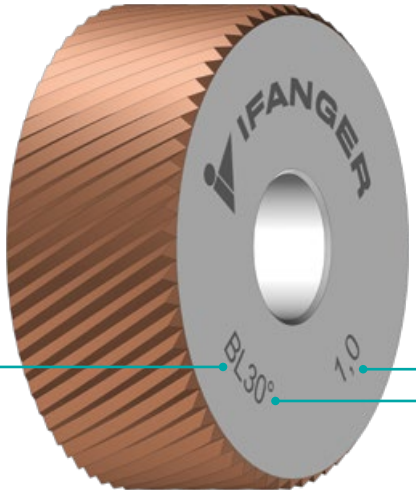
ACCURATE PLANARITY & ROUNDNESS



HONED BORE SMOOTH-RUNNING ANTI-GRIPP



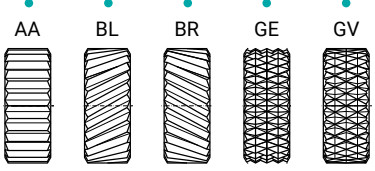
BRUSHED CLEAN TEETH

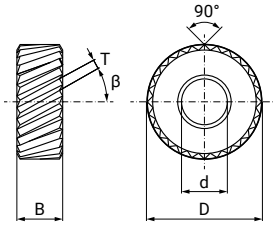


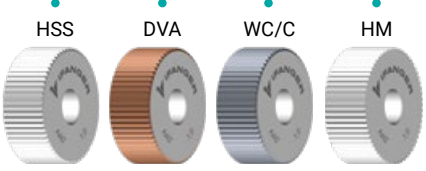
ifanger.com/RD_Knurl

Composition of order reference

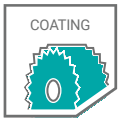
R	D	B	L	–	20	08	06	–	30	–	1.0	–	DVA
Method		Knurled profile			D	B	d		β		T		Coating
Knurling by deformation		Left (BL 30°)			20 mm	8 mm	6 mm		30°		1.0 mm		DVA



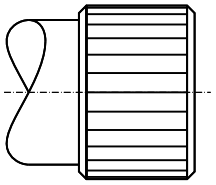
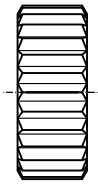
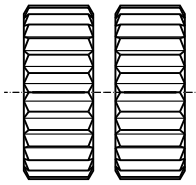
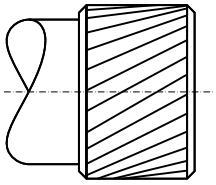
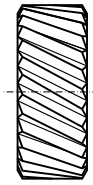
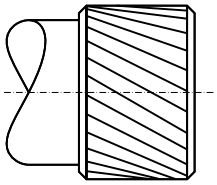
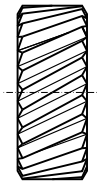
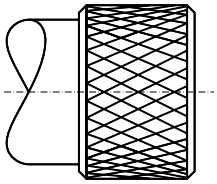
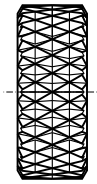
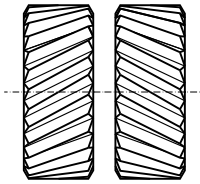
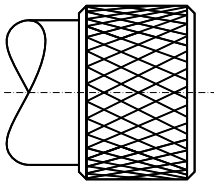
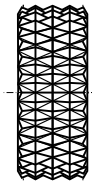




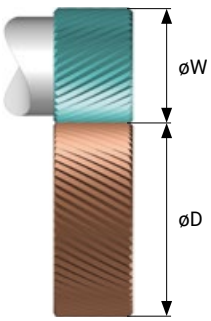






Workpiece	Standards see page 66	Choice of knurling rolls Holder with one roll	Holder with two rolls
	DIN 82 RAA ISO 13444 Type A UNI 149 A	 RDAA	 RDAA + RDAA
	DIN 82 RBL 30° (45°) ISO 13444 – UNI 149 B	 RDBR	
	DIN 82 RBR 30° (45°) ISO 13444 – UNI 149 C	 RDBL	
	DIN 82 RGE 30° (45°) ISO 13444 Type B UNI 149 D	 RDGV	 RDBL + RDBR
	DIN 82 RGV 30° (45°) ISO 13444 – UNI 149 E	 RDGE	

Workpiece ø W	Knurling roll ø D
0.5–2	8–10
2–8	10–12
8–20	15–20
20–120	20–25



Tool selection
Knurling by cutting

KNURLING BY CUTTING «RF»

Criteria
- Ideal when the focus is on the knurling look
- Lower forces than with knurling by deformation
- No increase in the workpiece diameter
- Particularly suitable for thin-walled workpieces
- Can also be used with brittle materials
- Can be used for the knurling of plastics
- Ideal for handles and flat knurling tips

Knurling by cutting is a machining process in which the desired pattern is created by a combination of scraping and forming. Unlike with knurling by deformation, this process requires lower forces on the workpiece. The knurling rolls are pressed against the rotating workpiece and move in the axial direction of the workpiece, whereby material is both removed and deformed.

ACCURATE PLANARITY & ROUNDNESS

HONED BORE SMOOTH-RUNNING ANTI-GRIPP

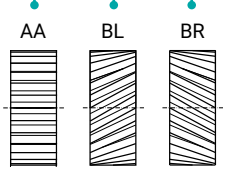
BRUSHED CLEAN TEETH

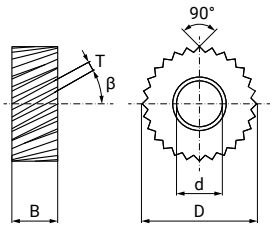


ifanger.com/RZS_Knurl

Composition of rder reference

R	F	B	L	–	20	05	11	–	15	–	1.0	–	TiN
Method		Knurled profile			D	B	d		β		T		Coating
Knurling by cutting		Left (BL 15°)			20 mm	5 mm	11 mm		15°		1.0 mm		TiN



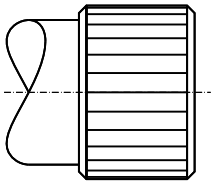
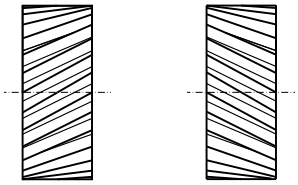
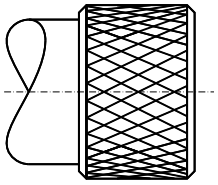
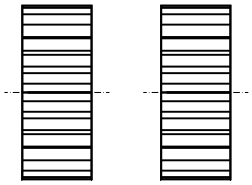
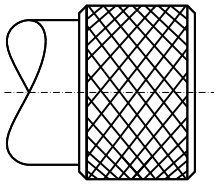
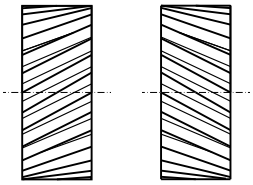




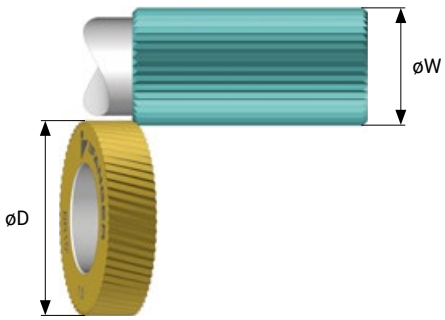
HSS

COATING

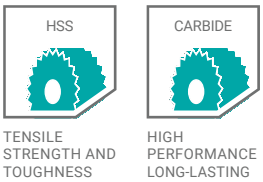
CARBIDE

Workpiece	Standards see page 66	Choice of knurling rolls Holder with one roll	Holder with two rolls
	DIN 82 RAA ISO Type A UNI 149 A	 RFBL 15° or RFBR 15°	
	DIN 82 RGE (30°) ISO Type B UNI 149 D		 RFAA + RFAA
	RGE (45°) – D		 RFBL 15° + RFBR 15°

Workpiece ø W	Knurling roll ø D
3–8	11–15
8–20	15–20
20–120	20–25



Knurling rolls
Materials



HSS – The material for maximum precision

Thanks to its specific material properties, high-speed steel (HSS) is the ideal material for knurling tools wherever precision, durability and cost-effectiveness are the focus.

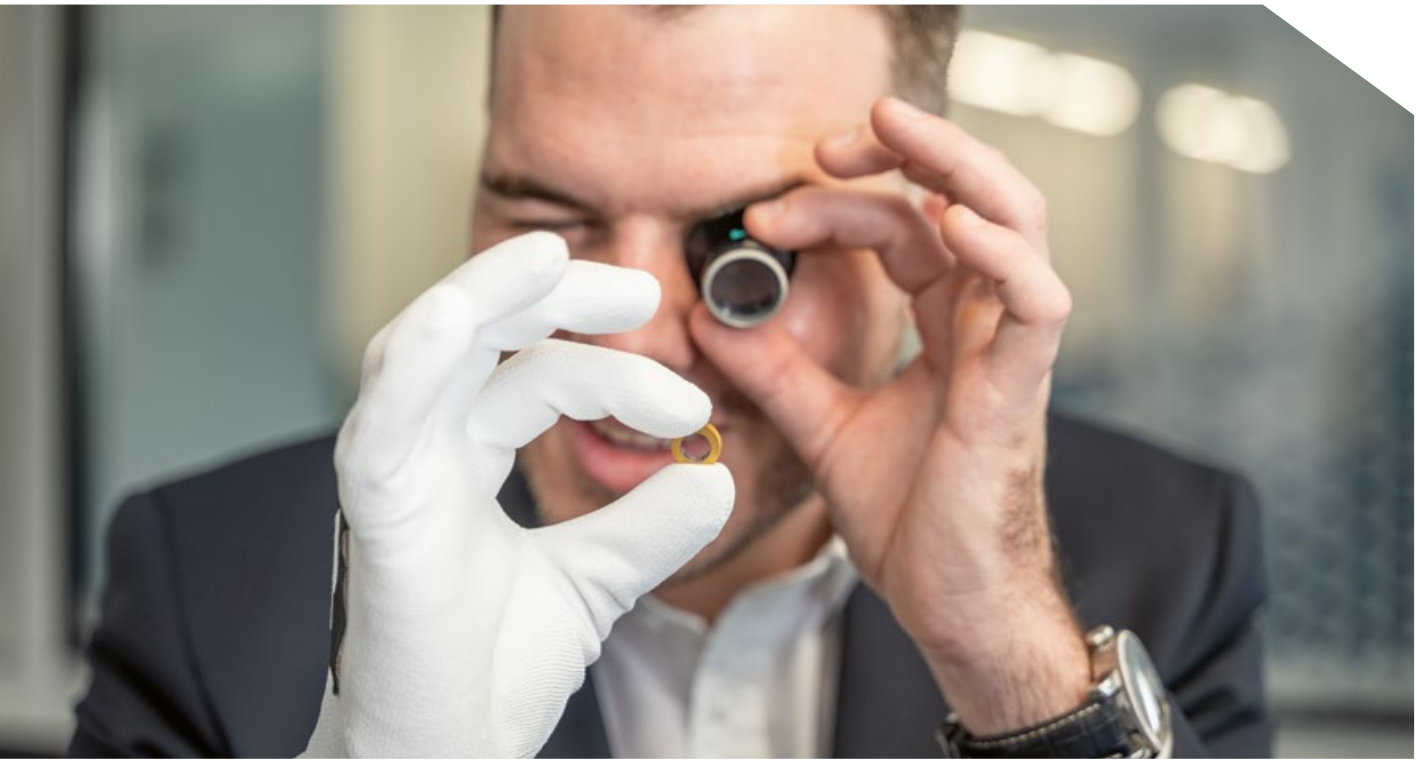
HSS offers:

- High temperature resistance: Maintains hardness up to approx. 600°C – ideal for high cutting speeds.
- Low susceptibility to breakage: More resilient than powder-metallurgical materials or carbide due to the extruded manufacturing process.
- Outstanding manufacturing quality: Swiss-Knurl tools feature face-ground surfaces on both sides and precisely honed bores. The result: maximum axial and radial run-out accuracy – for clean, dimensionally precise, and visually flawless knurls.
- Optional coatings for extreme applications: For particularly demanding tasks, HSS knurling rolls are also available with a special coating – ensuring maximum wear resistance and extended tool life.

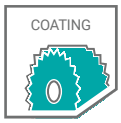
Carbide – For maximum service life and efficiency

Solid carbide knurling rolls offer outstanding wear resistance and are ideal for demanding series production. They are the first choice for machining materials with high deformation resistance – such as brass and similar alloys.

The combination of exceptional hardness and dimensional stability ensures consistently precise knurling, even in high-volume production – economical, reliable, and efficient.



Knurling rolls
Coatings



HIGH PERFORMANCE COATINGS

Higher performance and longer tool life thanks to coating

Coatings further enhance the performance and reliability of our knurling rolls. They not only increase wear resistance but also extend the tools' service life. Additionally, the coating provides effective protection against chemical influences – ensuring consistently precise results even under demanding conditions.

Coatings for knurling by deformation



DVA
Duplex coating.
For all materials.



WC/C
For stainless steels with a low carbon content such as 1.4301 (X 5 CrNi 18-10) or 1.4305 as well as for non-ferrous metals.

Coatings for knurling cutters

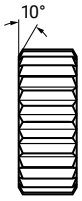


TiN
TiN is recommended when surface quality and versatility are paramount, especially when machining iron-based materials.



DLC
This coating is particularly suitable for non-ferrous metals such as aluminum, copper and brass if the highest demands are placed on the surface quality.

Optional chamfers - for longer tool life



Cutting rolls can be provided with chamfers on request. This measure improves the service life of the tools as it reduces edge breakage and wear. At the same time, however, the cutting ability is slightly reduced – a deliberate compromise for longer tool life with less aggressive cutting.

Standard values
Knurling by deformation

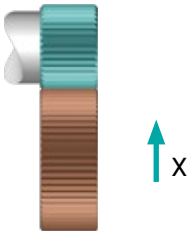
KNURLING BY DEFORMATION «RD»

Cutting speed (v_c) and feed rate (f_n)

The values given serve as a guide; the ideal cutting parameters must be determined for the respective application.

Material	ø Workpiece		ø Knurling roll		V_c (m/min.)	f_n (mm) on the Z axis	
	from	to	from	to		from	to
Free-machining steels	0.5	2	8	10	20	0.05	0.15
	2	8	10	12	25	0.05	0.20
	8	20	15	20	30	0.07	0.25
	20	120	20	25	30	0.07	0.30
Stainless steel	0.5	2	8	10	15	0.05	0.10
	2	8	10	12	20	0.05	0.15
	8	20	15	20	25	0.05	0.15
	20	120	20	25	25	0.07	0.25
Brass	0.5	2	8	10	30	0.05	0.15
	2	8	10	12	35	0.05	0.20
	8	20	15	20	40	0.07	0.25
	20	120	20	25	40	0.07	0.30
Aluminum	0.5	2	8	10	25	0.05	0.15
	2	8	10	12	30	0.05	0.20
	8	20	15	20	35	0.07	0.25
	20	120	20	25	35	0.07	0.30

Setup instructions Seite 62



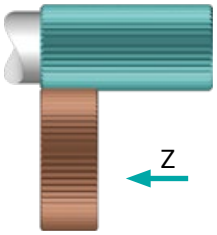
Feed on the X axis

For materials with very good plasticity: $f_n \approx 0.5 \times$ pitch
For materials with limited plasticity: $f_n \approx 0.25 \times$ pitch

Examples:
Aluminum (good plasticity):
Pitch: 0.8 mm
$f_n = 0.5 \times 0.8 = 0.4$ mm

Brass (medium plasticity):
Pitch: 0.8 mm
$f_n = 0.25 \times 0.8 = 0.2$ mm

In order for the knurling profile to be fully formed, the knurling roll should remain on the core diameter of the knurling profile for a few revolutions.



Feed on the Z axis

Knurling requires time for precise forming of the material. For optimum results, it is recommended to start with a reduced speed and lower feed rate than specified in the standard guidelines. A proven starting value for the feed on the Z axis is approx. 0.05 mm/rev.

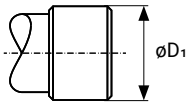
Diameter expansion

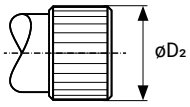
Knurling by deformation

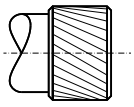
KNURLING BY DEFORMATION «RD»

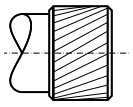
Guide values for increasing the workpiece diameter

The values are based on empirical data; the reel values must be found in the application.





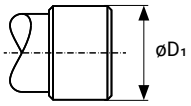


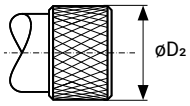


		Pitch 0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.5	2.0
Material	**øD₁**	**Guideline values for A – increase in workpiece diameter (mm)**								
Free-machining steels	5	0.08	0.14	0.18	0.20	0.21				
	10	0.09	0.14	0.18	0.20	0.22				
	20	0.11	0.15	0.21	0.27	0.34	0.42	0.46	0.53	0.61
Stainless steel	5	0.10	0.11	0.13	0.16	0.19				
	10	0.10	0.11	0.14	0.17	0.20				
	20	0.14	0.18	0.22	0.26	0.35	0.48	0.54	0.60	
Brass	5	0.10	0.14	0.18	0.22	0.26				
	10	0.10	0.15	0.20	0.24	0.30	0.35	0.41		
	20	0.10	0.15	0.21	0.25	0.30	0.36	0.43	0.46	0.50
Aluminum	5	0.10	0.12	0.18	0.22	0.26				
	10	0.10	0.14	0.19	0.22	0.38	0.42	0.48	0.57	0.66
	20	0.10	0.15	0.20	0.26	0.32	0.45	0.52	0.59	0.75

$øD_2 = øD_1 + A$

Example: Knurl RAA, free-cutting steel, $øD_1$ = 20 mm, pitch = 1 mm, A = 0.42 mm, $øD_2$ ca. 20.42 mm





		Pitch 0.3	0.4	0.5	0.6	0.8	1.0	1.2	1.5	2.0
Material	**øD₁**	**Guideline values for A – increase in workpiece diameter (mm)**								
Free-machining steels	5	0.05	0.09	0.11	0.14	0.15				
	10	0.05	0.10	0.12	0.15	0.16				
	20	0.06	0.10	0.12	0.19	0.22	0.28	0.33	0.42	0.50
Stainless steel	5	0.06	0.07	0.09	0.11	0.12				
	10	0.06	0.08	0.10	0.12	0.13				
	20	0.06	0.10	0,14	0.18	0.23	0.28	0.34	0.44	
Brass	5	0.06	0.08	0.10	0.15	0.16				
	10	0.07	0.10	0.15	0.18	0.22	0.28	0.32		
	20	0.09	0.12	0.18	0.21	0.25	0.30	0.35	0.38	
Aluminum	5	0.06	0.08	0.11	0.15	0.21				
	10	0.06	0.09	0.18	0.24	0.30	0.33	0.38	0.45	0.51
	20	0.07	0.10	0.20	0.26	0.34	0.40	0.50	0.68	0.78

Standard values
Knurling by cutting

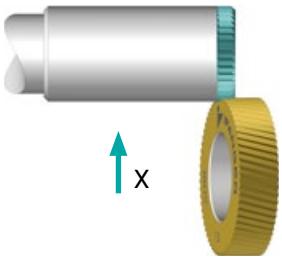
KNURLING BY CUTTING «RF»

Cutting speed (v_c) and feed rate (f_n)

The values given serve as a guide; the ideal cutting parameters must be determined for the respective application.

Material	ø workpiece		ø knurling roll		V_c (m/min.)	f_n (mm) on the Z axis	
	from	to	from	to		from	to
Steels up to 900 N/mm²	3	8	8.9	15.0	25	0.04	0.07
	8	20	14.5	20.0	30	0.05	0.12
	20	>100	20.0	25.0	35	0.06	0.16
Stainless steels	3	8	8.9	15.0	20	0.04	0.06
	8	20	14.5	20.0	25	0.05	0.08
	20	>100	20.0	25.0	30	0.06	0.12
Steel casting, gray cast iron	3	8	8.9	15.0	20	0.04	0.06
	8	20	14.5	20.0	25	0.05	0.08
	20	>100	20.0	25.0	30	0.06	0.12
Brass	3	8	8.9	15.0	70	0.06	0.13
	8	20	14.5	20.0	85	0.10	0.25
	20	>100	20.0	25.0	100	0.10	0.25
Plastics	Standard values on request						

Setup instructions Seite 64

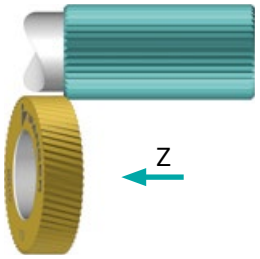


Feed on the X axis

For materials with very good plasticity: $f_n \approx 0.5 \times$ pitch
For materials with limited plasticity: $f_n \approx 0.25 \times$ pitch

Examples:
Aluminum (good plasticity):
Pitch: 0.8 mm
$f_n = 0.5 \times 0.8 = 0.4$ mm

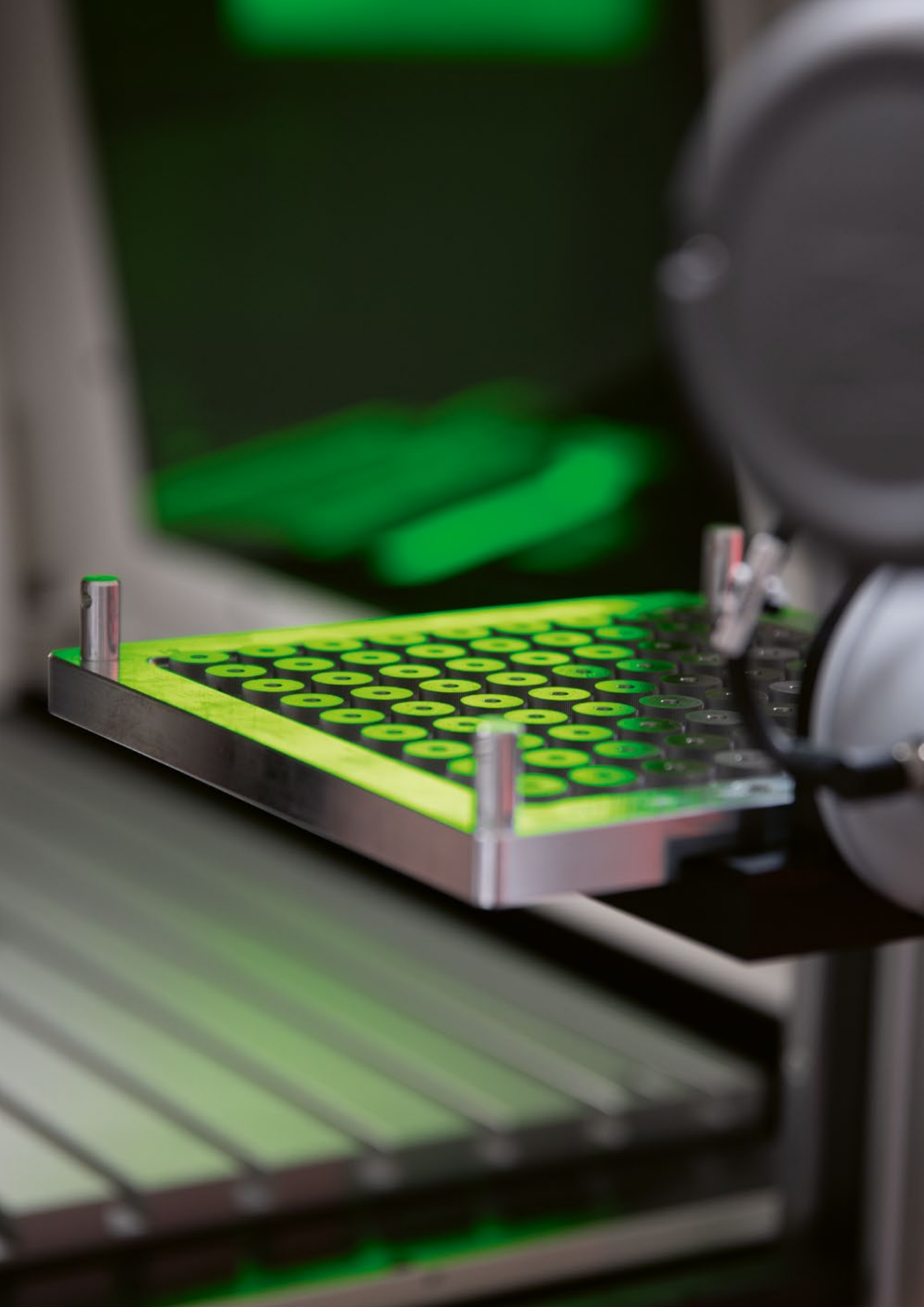
Brass (medium plasticity):
Pitch: 0.8 mm
$f_n = 0.25 \times 0.8 = 0.2$ mm



In order for the knurling profile to be fully formed, the knurling roll should remain on the core diameter of the knurling profile for a few revolutions.

Feed on the Z axis

Knurling requires time for precise cutting and forming of the material. For optimum results, it is recommended to start with a reduced speed and lower feed rate than specified in the standard guidelines. A proven starting value for the feed on the Z axis is approx. 0.05 mm/rev.



RDAA

Rolls for knurling by deformation made of HSS



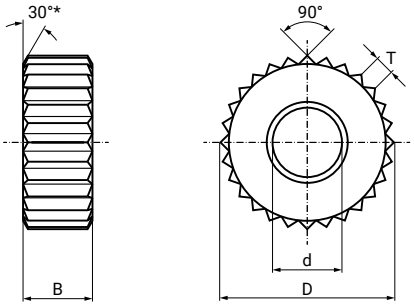
KNURLING BY DEFORMATION «RD»



TENSILE STRENGTH AND TOUGHNESS



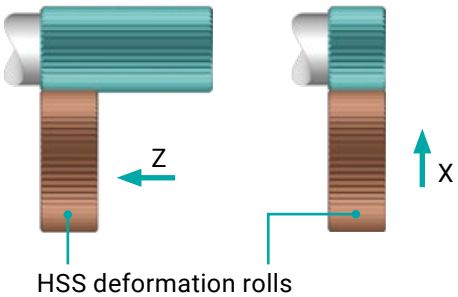
Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	Ref. Nº	T**																	Coating		
			mm	0.1	0.15	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.6	1.75	2.0	2.5	HSS	WC/C	DVA
			TPI***	254	169	127	102	85	64	51	42	36	32	28	25	21	17	16	15	13	10			
8	3	3	RDAA-080303-00	●	●	●	●	●	●	●	●	●	●	○	●							●	○	○
8	4	3	RDAA-080403-00	○	○	●	●	●	●	●	●	●	●	○	●							●	○	○
10	2	3	RDAA-100203-00	●	●	●	●	●	●	●	●	●	●	○	○							●	○	○
10	3	3	RDAA-100303-00	●	●	●	●	●	●	●	●	●	●	○	●							●	○	○
10	4	3	RDAA-100403-00	○	○	●	●	●	●	●	●	●	●	○	●	●	●					●	○	○
10	4	4	RDAA-100404-00	○	○	●	●	●	●	●	●	●	●	●	●	●	●					●	○	○
12	4	4	RDAA-120404-00	○	○	○	○	●	●	●	●	●	●	●	●	●	●					●	○	○
15	4	4	RDAA-150404-00	○	○	●	●	●	●	●	●	●	●	●	●	●	●	○	○	○		●	○	○
15	5	4	RDAA-150504-00			○	○	●	●	●	●	●	●	●	●	●	●	○	○	○		●	○	○
15	5	5	RDAA-150505-00			○	○	●	●	●	●	●	●	●	●	●	●	○	○	●		●	○	○
15	6	4	RDAA-150604-00			○	○	●	●	●	●	●	●	○	●	●	○	○	○	●		●	○	○
15	6	5	RDAA-150605-00				○	●	●	●	●	●	●	○	●	●	○	○	○	●		●	○	○
20	6	6	RDAA-200606-00					●	●	●	●	●	●	○	●	●	●	●	●	●		●	○	○
20	8	6	RDAA-200806-00					●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
20	10	6	RDAA-201006-00					○	●	●	●	○	●	○	●	●	●	○	○	●	○	●	○	○
25	8	6	RDAA-250806-00							○	○	○	○	○	●	●	●	○	○	●	○	●	○	○

* *From a pitch of 0.3 mm and a width of 3 mm, knurling rolls are manufactured with 30° chamfers on both sides as a rule.*
Exception: Reference no. RDAA-100203 – this version is always sharp, without chamfers.
** *Pitch of 0.13, 0.14, 0.16, and 0.45 are available on request.*
*** *TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RAA (DIN 82)
Type A (ISO 13444)



RDAA

Rolls for knurling by deformation made of carbide

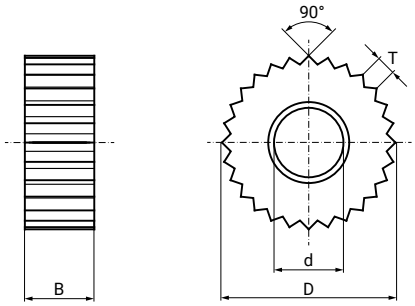
KNURLING BY DEFORMATION «RD»

CARBIDE

HIGH PERFORMANCE LONG-LASTING



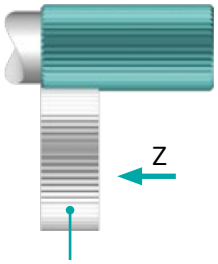
Standard values (V_c/f_n) page 12
Coatings page 11



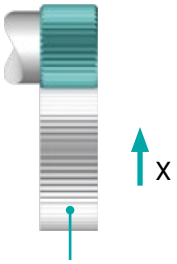
D	B	d	Ref. Nº	T									
			mm	0.2	0.25	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
			TPI*	127	102	85	64	51	42	36	32	28	25
8	3	3	RDAA-080303-00-__-HM	●	○	●	●	○	○				
8	4	3	RDAA-080403-00-__-HM	●	○	●	●	●	○				
10	2	3	RDAA-100203-00-__-HM	○	○	●	○	○	○	○	○		
10	3	3	RDAA-100303-00-__-HM	○	●	●	●	●	●	○	●		
10	4	3	RDAA-100403-00-__-HM	○	○	●	●	●	●	○	○		
10	4	4	RDAA-100404-00-__-HM	●	○	●	●	●	●	●	●		
12	4	4	RDAA-120404-00-__-HM	○	○	●	●	○	●	○	●		
15	4	4	RDAA-150404-00-__-HM	○	○	●	●	●	●	●	●	○	●
15	5	4	RDAA-150504-00-__-HM			○	●	○	●	○	○	○	○
15	5	5	RDAA-150505-00-__-HM			○	●	○	●	○	●	○	○

** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RAA (DIN 82)
Type A (ISO 13444)



The carbide rolls can be supplied with chamfers on request. This improves the tool's lifetime for operations with sidewise feeding



Carbide rolls without chamfers

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RDAA-080303-00-0.2-HM

● Shop-item ○ Available on request

ifanger.com/en/shop

RDBL

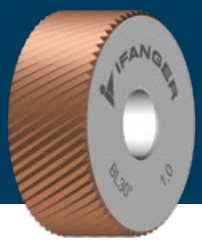
Rolls for knurling by deformation made of HSS



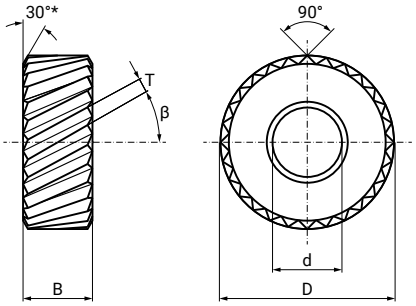
KNURLING BY DEFORMATION «RD»



TENSILE STRENGTH AND TOUGHNESS



Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. Nº	T													Coating		
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.6	1.75	2.0	HSS	WC/C	DVA
				TPI *	85	64	51	42	36	32	28	25	21	17	16	15	13			
8	3	3	30°	RDBL-080303-30	●	●	●	●	●	●	○	●						●	○	○
8	3	3	45°	RDBL-080303-45	●	●	●	●	●	●	○	●						●	○	○
8	4	3	30°	RDBL-080403-30	●	●	●	●	●	●	○	●						●	○	○
8	4	3	45°	RDBL-080403-45	●	●	●	●	●	●	○	●						●	○	○
10	3	3	30°	RDBL-100303-30	●	●	●	●	●	●	○	●	○	○				●	○	○
10	3	3	45°	RDBL-100303-45	●	●	●	●	●	●	○	●	○	○				●	○	○
10	4	3	30°	RDBL-100403-30	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	3	45°	RDBL-100403-45	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	4	30°	RDBL-100404-30	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	4	45°	RDBL-100404-45	●	●	●	●	●	●	○	●	●	●				●	○	○
12	4	4	30°	RDBL-120404-30	○	●	○	●	○	○	○	○	○	○				●	○	○
12	4	4	45°	RDBL-120404-45	●	●	●	●	●	●	○	●	●	●				●	○	○
15	4	4	30°	RDBL-150404-30	●	●	●	●	●	●	●	●	●	●				●	○	○
15	4	4	45°	RDBL-150404-45	●	●	●	●	●	●	●	●	●	●				●	○	○
15	4	4	30°	RDBL-150504-30	○	●	●	●	●	●	●	●	●	●				●	○	○
15	5	4	45°	RDBL-150504-45	○	●	●	●	●	●	●	●	●	●				●	○	○
15	5	5	30°	RDBL-150505-30	●	●	●	●	●	●	○	●	●	●		○	○	●	○	○
15	5	5	45°	RDBL-150505-45	●	●	●	●	●	●	●	●	●	●		○	○	●	○	○
15	6	4	30°	RDBL-150604-30	○	●	●	●	○	●	○	●	●	●				●	○	○
15	6	4	45°	RDBL-150604-45	○	●	●	●	○	●	○	●	●	●				●	○	○
15	6	5	30°	RDBL-150605-30	○	●	●	●	○	●	○	●	○	○				●	○	○
15	6	5	45°	RDBL-150605-45	○	●	●	●	○	●	○	●	○	○				●	○	○
20	6	6	30°	RDBL-200606-30	●	●	●	●	○	●	○	●	●	●	○	○	●	●	○	○
20	6	6	45°	RDBL-200606-45	●	●	●	●	○	●	○	●	●	●	○	○	●	●	○	○
20	8	6	30°	RDBL-200806-30	○	●	●	●	●	●	○	●	●	●	●	●	●	●	○	○
20	8	6	45°	RDBL-200806-45	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
20	10	6	30°	RDBL-201006-30	○	●	●	○	○	○	○	●	●	●	○	○	○	●	○	○
20	10	6	45°	RDBL-201006-45	●	○	●	●	○	●	○	●	●	●	○	○	●	●	○	○
25	8	6	45°	RDBL-250806-45						●	○	●	●	●	○	○	●	●	○	○

** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RDBL

Rolls for knurling by deformation made of carbide

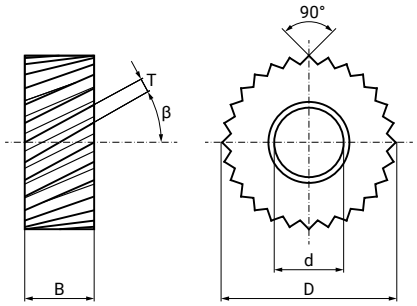
KNURLING BY DEFORMATION «RD»

CARBIDE

HIGH PERFORMANCE LONG-LASTING



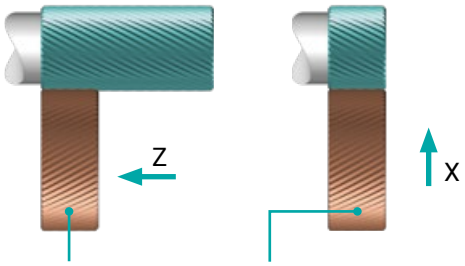
Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. N°	T					
				mm	0.3	0.4	0.5	0.6	0.8	1.0
				TPI *	85	64	51	42	32	25
8	3	3	30°	RDBL-080303-30-__-HM	○	●	○	○		
8	3	3	45°	RDBL-080303-45-__-HM	○	●	○	●		
10	3	3	30°	RDBL-100303-30-__-HM	○	○	●	○	○	○
10	4	3	45°	RDBL-100403-45-__-HM	○	○	○	○	○	●
10	4	4	30°	RDBL-100404-30-__-HM	○	○	●	●	○	○
10	4	4	45°	RDBL-100404-45-__-HM	●	●	●	○	●	●
15	4	4	45°	RDBL-150404-45-__-HM	○	○	○	●	●	○
15	5	4	45°	RDBL-150504-45-__-HM	○	○	○	●	○	○

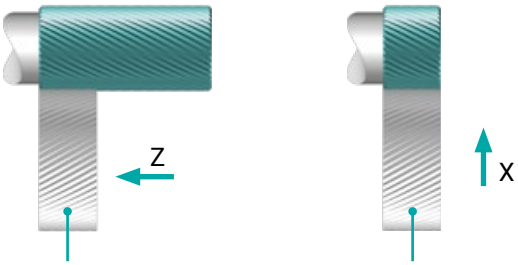
** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RBR 30° (DIN 82)
RBR 45° (not standardized)



HSS deformation rolls

RBR 30° (DIN 82)
RBR 45° (not standardized)



The carbide rolls can be supplied with chamfers on request. This improves the lifetime for operations with sidewise feeding

Carbide deformation rolls without chamfers

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RDBL-080303-30-0.3-HM

● Shop-item ○ Available on request

ifanger.com/en/shop

RDBR

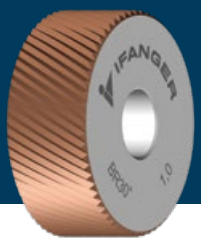
Rolls for knurling by deformation made of HSS



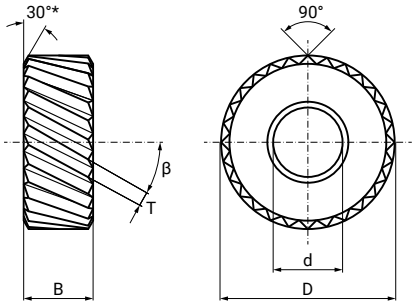
KNURLING BY DEFORMATION «RD»



TENSILE STRENGTH AND TOUGHNESS



Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. Nº	T													Coating		
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.6	1.75	2.0	HSS	WC/C	DVA
				TPI *	85	64	51	42	36	32	28	25	21	17	16	15	13			
8	3	3	30°	RDBR-080303-30	●	●	●	●	●	●	○	●						●	○	○
8	3	3	45°	RDBR-080303-45	●	●	●	●	●	●	○	●						●	○	○
8	4	3	30°	RDBR-080403-30	●	●	●	●	●	●	○	●						●	○	○
8	4	3	45°	RDBR-080403-45	●	●	●	●	●	●	○	●						●	○	○
10	3	3	30°	RDBR-100303-30	●	●	●	●	●	●	○	●	○	○				●	○	○
10	3	3	45°	RDBR-100303-45	●	●	●	●	●	●	○	●	○	○				●	○	○
10	4	3	30°	RDBR-100403-30	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	3	45°	RDBR-100403-45	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	4	30°	RDBR-100404-30	●	●	●	●	●	●	○	●	●	●				●	○	○
10	4	4	45°	RDBR-100404-45	●	●	●	●	●	●	○	●	●	●				●	○	○
12	4	4	30°	RDBR-120404-30	○	●	○	●	○	○	○	○	○	○				●	○	○
12	4	4	45°	RDBR-120404-45	●	●	●	●	●	●	○	●	●	●				●	○	○
15	4	4	30°	RDBR-150404-30	●	●	●	●	●	●	●	●	●	●				●	○	○
15	4	4	45°	RDBR-150404-45	●	●	●	●	●	●	●	●	●	●				●	○	○
15	4	4	30°	RDBR-150504-30	○	●	●	●	●	●	●	●	●	●				●	○	○
15	5	4	45°	RDBR-150504-45	○	●	●	●	●	●	●	●	●	●				●	○	○
15	5	5	30°	RDBR-150505-30	●	●	●	●	●	●	○	●	●	●		○	○	●	○	○
15	5	5	45°	RDBR-150505-45	●	●	●	●	●	●	●	●	●	●		○	○	●	○	○
15	6	4	30°	RDBR-150604-30	○	●	●	●	○	●	○	●	●	●				●	○	○
15	6	4	45°	RDBR-150604-45	○	●	●	●	○	●	○	●	●	●				●	○	○
15	6	5	30°	RDBR-150605-30	○	●	●	●	○	●	○	●	○	○				●	○	○
15	6	5	45°	RDBR-150605-45	○	●	●	●	○	●	○	●	○	○				●	○	○
20	6	6	30°	RDBR-200606-30	●	●	●	●	○	●	○	●	●	●	○	○	●	●	○	○
20	6	6	45°	RDBR-200606-45	●	●	●	●	○	●	○	●	●	●	○	○	●	●	○	○
20	8	6	30°	RDBR-200806-30	○	●	●	●	●	●	○	●	●	●	●	●	●	●	○	○
20	8	6	45°	RDBR-200806-45	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
20	10	6	30°	RDBR-201006-30	○	●	●	○	○	○	○	●	●	●	○	○	○	●	○	○
20	10	6	45°	RDBR-201006-45	●	○	●	●	○	●	○	●	●	●	○	○	●	●	○	○
25	8	6	45°	RDBR-250806-45						●	○	●	●	●	○	○	●	●	○	○

** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

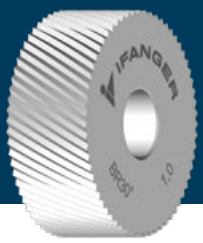
RDBR

Rolls for knurling by deformation made of carbide

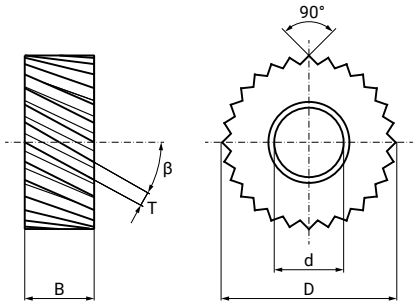
KNURLING BY DEFORMATION «RD»

CARBIDE

HIGH PERFORMANCE LONG-LASTING



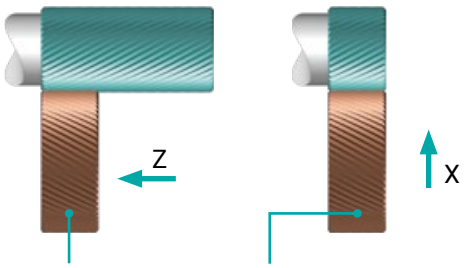
Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. N°	T					
				mm	0.3	0.4	0.5	0.6	0.8	1.0
				TPI *	85	64	51	42	32	25
8	3	3	30°	RDBR-080303-30-__-HM	○	●	○	○		
8	3	3	45°	RDBR-080303-45-__-HM	○	●	○	●		
10	3	3	30°	RDBR-100303-30-__-HM	○	○	●	○	○	○
10	4	3	45°	RDBR-100403-45-__-HM	○	○	○	○	○	●
10	4	4	30°	RDBR-100404-30-__-HM	○	○	●	●	○	○
10	4	4	45°	RDBR-100404-45-__-HM	●	●	●	○	●	●
15	4	4	45°	RDBR-150404-45-__-HM	○	○	○	●	●	○
15	5	4	45°	RDBR-150504-45-__-HM	○	○	○	●	○	○

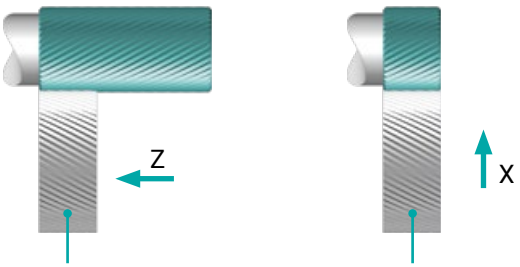
** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RBR 30° (DIN 82)
RBR 45° (not standardized)



HSS deformation rolls

RBR 30° (DIN 82)
RBR 45° (not standardized)



The carbide rolls can be supplied with chamfers on request. This improves the lifetime for operations with sidewise feeding

Carbide deformation rolls without chamfers

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RDBR-080303-30-0.3-HM

● Shop-item ○ Available on request

ifanger.com/en/shop

RDGE

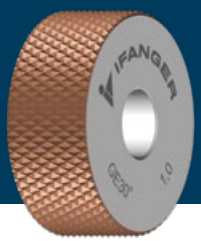
Rolls for knurling by deformation made of HSS



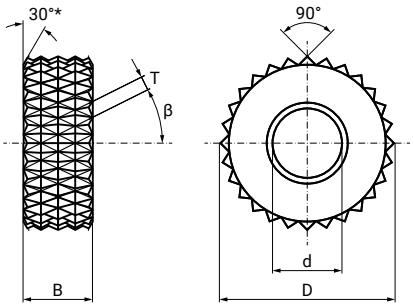
KNURLING BY DEFORMATION «RD»



TENSILE STRENGTH AND TOUGHNESS



Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. Nº	T													Coating		
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.6	1.75	2.0	HSS	WC/C	DVA
				TPI*	85	64	51	42	36	32	28	25	21	17	16	15	13			
8	3	3	30°	RDGE-080303-30	●	●	●	●	●	●		●						●	○	○
8	3	3	45°	RDGE-080303-45	●	●	●	●	●	●		●						●	○	○
8	4	3	30°	RDGE-080403-30	●	●	●	●	●	●		●						●	○	○
8	4	3	45°	RDGE-080403-45	●	●	●	●	●	●		●						●	○	○
10	3	3	30°	RDGE-100303-30	●	●	●	●	●	●		●						●	○	○
10	3	3	45°	RDGE-100303-45	●	●	●	●	●	●		●	●					●	○	○
10	4	3	30°	RDGE-100403-30	●	●	●	●	●	●		●	●	●				●	○	○
10	4	3	45°	RDGE-100403-45	●	●	●	●	●	●		●	●	●				●	○	○
10	4	4	30°	RDGE-100404-30	●	●	●	●	●	●		●	●	●				●	○	○
10	4	4	45°	RDGE-100404-45	●	●	●	●	●	●		●	●	●				●	○	○
12	4	4	30°	RDGE-120404-30	○	○	○	○		○		○						●	○	○
12	4	4	45°	RDGE-120404-45	●	●	●	●		●		●						●	○	○
15	4	4	30°	RDGE-150404-30	●	●	●	●	●	●	●	●	●	●				●	○	○
15	4	4	45°	RDGE-150404-45	●	●	●	●	●	●	●	●	●	●				●	○	○
15	5	4	30°	RDGE-150504-30	●	●	●	●	●	●	●	●	●	●				●	○	○
15	5	4	45°	RDGE-150504-45	●	●	●	●	●	●	●	●	●	●				●	○	○
15	5	5	30°	RDGE-150505-30	●	●	●	●	●	●	●	●	●	●				●	○	○
15	5	5	45°	RDGE-150505-45	●	●	●	●		●		●	●	●				●	○	○
15	6	4	30°	RDGE-150604-30		●	●	●		●		●	●	●				●	○	○
15	6	4	45°	RDGE-150604-45		●	●	●		●		●	●	●				●	○	○
15	6	5	30°	RDGE-150605-30		○	○	○		○		○						●	○	○
15	6	5	45°	RDGE-150605-45		●	●	●		●		●						●	○	○
20	6	6	30°	RDGE-200606-30		●	●	●		●		●	●	●			●	●	○	○
20	6	6	45°	RDGE-200606-45	●	●	●	●		●		●	●	●			●	●	○	○
20	8	6	30°	RDGE-200806-30	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
20	8	6	45°	RDGE-200806-45	●	●	●	●	●	●	●	●	●	●	●	●	●	●	○	○
20	10	6	30°	RDGE-201006-30			●	●		●		●	●	●				●	○	○
20	10	6	45°	RDGE-201006-45	●	●	●	●		●		●	●	●			●	●	○	○

** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

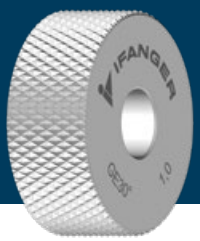
RDGE

Rolls for knurling by deformation made of carbide

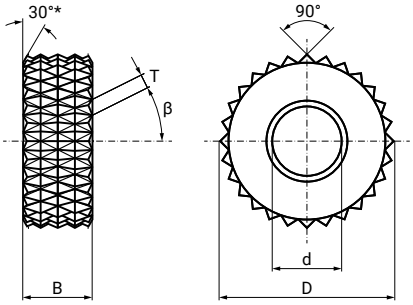
KNURLING BY DEFORMATION «RD»

CARBIDE

HIGH PERFORMANCE LONG-LASTING



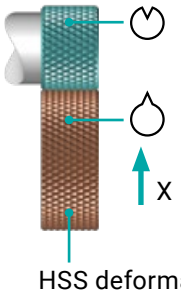
Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. N°	T					
				mm	0.3	0.4	0.5	0.6	0.8	1.0
				TPI *	85	64	51	42	32	25
8	3	3	30°	RDGE-080303-30-__-HM	○	●	○	○		
8	3	3	45°	RDGE-080303-45-__-HM	○	●	○	●		
10	3	3	30°	RDGE-100303-30-__-HM	○	○	●	○	○	○
10	4	3	45°	RDGE-100403-45-__-HM	○	○	○	○	○	●
10	4	4	30°	RDGE-100404-30-__-HM	○	○	●	●	○	○
10	4	4	45°	RDGE-100404-45-__-HM	●	●	●	○	●	●
15	4	4	45°	RDGE-150404-45-__-HM	○	○	○	●	●	○
15	5	4	45°	RDGE-150504-45-__-HM	○	○	○	●	○	○

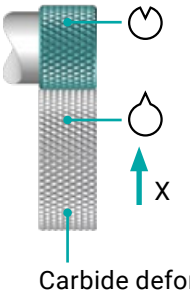
** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

RGV 30° (DIN 82)
RGV 45° (not standardized)



HSS deformation rolls

RGV 30° (DIN 82)
RGV 45° (not standardized)



Carbide deformation rolls

RDGE carbide deformation rolls cannot be used with sidewise feeding on the Z axis.
They can only be used with plunging.

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RDGE-080303-30-0.3-HSS

● Shop-item ○ Available on request

ifanger.com/en/shop

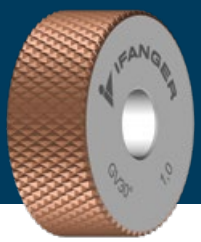
RDGV

Rolls for knurling by deformation made of HSS

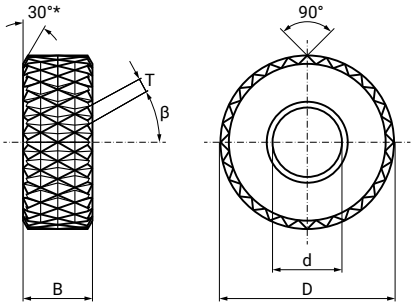
KNURLING BY DEFORMATION «RD»

HSS

TENSILE STRENGTH AND TOUGHNESS



Standard values (V_c/f_n) page 12
Coatings page 11



D	B	d	β	Ref. Nº	T												Coating		
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.75	2.0	HSS	WC/C	DVA
				TPI *	85	64	51	42	36	32	28	25	21	17	15	13			
8	3	3	30°	RDGV-080303-30	●	●	●	●	●	●		●					●	○	○
8	3	3	45°	RDGV-080303-45	●	●	●	●	●	●		●					●	○	○
8	4	3	30°	RDGV-080403-30	●	●	●	●	●	●		●					●	○	○
8	4	3	45°	RDGV-080403-45	●	●	●	●	●	●		●					●	○	○
10	3	3	30°	RDGV-100303-30	●	●	●	●	●	●		●					●	○	○
10	3	3	45°	RDGV-100303-45	●	●	●	●	●	●		●					●	○	○
10	4	3	30°	RDGV-100403-30	●	●	●	●	●	●		●	●	●			●	○	○
10	4	3	45°	RDGV-100403-45	●	●	●	●	●	●		●	●	●			●	○	○
10	4	4	30°	RDGV-100404-30	●	●	●	●	●	●		●	●	●			●	○	○
10	4	4	45°	RDGV-100404-45	●	●	●	●	●	●		●	●	●			●	○	○
12	4	4	30°	RDGV-120404-30	○	○	○	○	○	○		○					●	○	○
12	4	4	45°	RDGV-120404-45	●	●	●	●	●	●		●					●	○	○
15	4	4	30°	RDGV-150404-30	●	●	●	●	●	●		●	●	●			●	○	○
15	4	4	45°	RDGV-150404-45	●	●	●	●	●	●		●	●	●			●	○	○
15	5	4	30°	RDGV-150504-30		●	●	●	●	●	●	●	●	●			●	○	○
15	5	4	45°	RDGV-150504-45		●	●	●	●	●	●	●	●	●			●	○	○
15	5	5	30°	RDGV-150505-30		●	●	●		●		●	●	●			●	○	○
15	5	5	45°	RDGV-150505-45		●	●	●	●	●		●	●	●			●	○	○
15	6	4	30°	RDGV-150604-30	●	●	●	●		●		●	●	●			●	○	○
15	6	4	45°	RDGV-150604-45	●	●	●	●		●		●	●	●			●	○	○
20	6	6	30°	RDGV-200606-30		○	○	○		○		○	○	○			●	○	○
20	6	6	45°	RDGV-200606-45		●	●	●		●		●	●	●			●	○	○
20	8	6	30°	RDGV-200806-30		●	●	●		●		●	●	●			●	○	○
20	8	6	45°	RDGV-200806-45	●	●	●	●	●	●		●	●	●			●	○	○
20	10	6	30°	RDGV-201006-30						●		●	●	●			●	○	○
20	10	6	45°	RDGV-201006-45		●	●	●		●		●	●	●			●	○	○

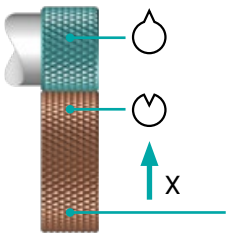
** TPI = number of teeth per 25.4 mm (1 inch); values are rounded.*

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RDGV-080303-30-0.3-HSS

● Shop-item ○ Available on request

ifanger.com/en/shop



RGE 30° (DIN 82)
Type B (ISO 13444) RGE 45° (not standardized)

HSS deformation rolls

RDGV rolls must not be used with sidewise feeding on the Z axis;
they are designed for plunge feeding only.

RFAA

Rolls for knurling by cutting made of HSS

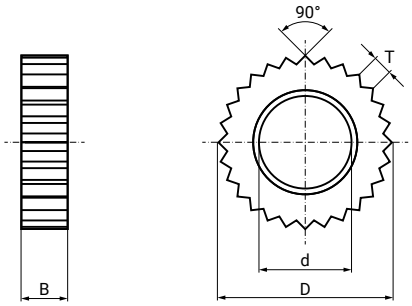

KNURLING BY CUTTING «RF»



TENSILE STRENGTH AND TOUGHNESS

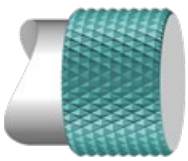


Standard values (V_c/f_n) page 14
Coatings page 11

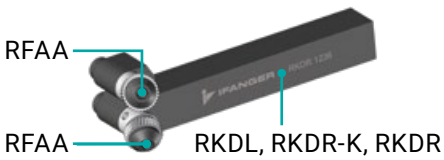


D	B	d	Ref. N°	T												Coating	
			mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.6	1.75	2.0	HSS	TIN
			TPI *	85	64	51	42	36	32	28	25	21	17	16	15	13		
8.9	2.5	4	RFAA-090204-00 **	●	●	●	●	●	●		●	●	●				●	○
11.0	3.0	6	RFAA-110306-00	●	●	●	●	●	●	●	●	●	●				●	○
14.5	3.0	5	RFAA-140305-00 **	●	●	●	●	●	●		●	●	●				●	○
15.0	4.0	8	RFAA-150408-00 **			●	●		●		●	●	●				●	○
15.0	4.0	9	RFAA-150409-00	○	○	●	●	●	●	○	●	●	●	●			●	○
20.0	5.0	8	RFAA-200508-00 **			●	●		●		●	●	●		●		●	○
20.0	5.0	11	RFAA-200511-00	●	●	●	●		●		●	●	●			●	●	○
21.5	5.0	8	RFAA-210508-00 **	●	●	●	●		●		●	●	●		●	●	●	○
25.0	5.0	11	RFAA-250511-00		●	●	●		●		●	●	●	●	●	●	●	○
25.0	6.0	8	RFAA-250608-00 **		●	●	●		●		●	●	●			●	●	○

* *TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
** *These rolls are compatible with holders of other makes. Further information can be found in our webshop.*



RGE 30° (DIN 82)
Type B (ISO 13444)



Order directly online
Order the suitable tool easily online via QR code or weblink.
Example of an order-number: RFAA-090204-00-0.3-HSS

All cutting rolls can by delivered with 10° chamfers on request.

● Shop-item ○ Available on request

ifanger.com/en/shop

RFAA

Rolls for knurling by cutting made of carbide

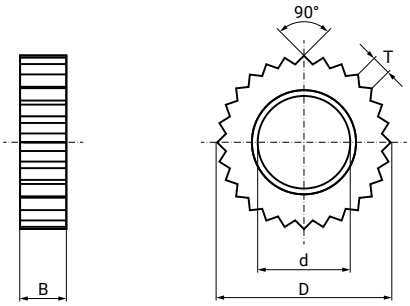
KNURLING BY CUTTING «RF»

CARBIDE

HIGH PERFORMANCE LONG-LASTING

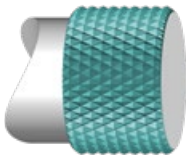


Standard values (V_c/f_n) page 14
Coatings page 11



D	B	d	Ref. Nº	T						
			mm	0.3	0.4	0.5	0.6	0.7	0.8	1.0
			TPI *	85	64	51	42	36	32	25
8.9	2.5	4	RFAA-090204-00-__-HM **	○	○	○	○	○	○	○
11.0	3.0	6	RFAA-110306-00-__-HM	●	○	●	●	●	●	●
15.0	4.0	9	RFAA-150409-00-__-HM		○	○	●	○	●	●
21.5	5.0	8	RFAA-210508-00-__-HM **			○	○	○	●	○

* *TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
** *These rolls are compatible with holders of other makes. Further information can be found in our webshop.*



RGE 30° (DIN 82)
Type B (ISO 13444)



Order directly online
Order the suitable tool easily online via QR code or weblink.
Example of an order-number: RFAA-090204-00-0.3-HM

All cutting rolls can by delivered with 10° chamfers on request.

○ Shop-item ○ Available on request

ifanger.com/en/shop

RFBL

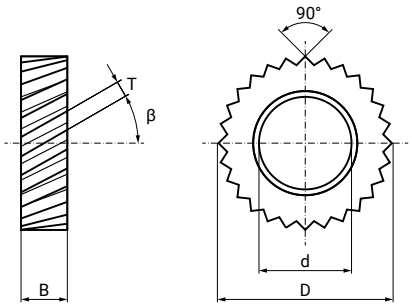
Rolls for knurling by cutting made of HSS





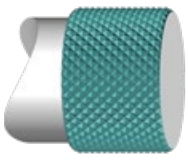


Standard values (V_c/f_n) page 14



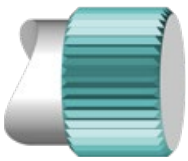
D	B	d	β	Ref. Nº	T												Coating	
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.75	2.0	HSS	TIN
				TPI *	85	64	51	42	36	32	28	25	21	17	15	13		
8.9	2.5	4	15°	RFBL-090204-15 **	●	●	●	●	●	●		●	●				●	○
8.9	2.5	4	30°	RFBL-090204-30 **	●	●	●	●	●	●		●	●				●	○
11.0	3.0	6	15°	RFBL-110306-15	●	●	●	●	●	●	●	●	●	●	●		●	○
11.0	3.0	6	30°	RFBL-110306-30	●	●	●	●	●	●		●	●	●			●	○
14.5	3.0	5	15°	RFBL-140305-15 **		●	●	●		●		●	●	●			●	○
14.5	3.0	5	30°	RFBL-140305-30 **		●	●	●		●		●	●	●			●	○
15.0	4.0	8	15°	RFBL-150408-15 **			●	●		●		●	●	●			●	○
15.0	4.0	8	30°	RFBL-150408-30 **			●	●		●		●	●	●			●	○
15.0	4.0	9	15°	RFBL-150409-15	●	●	●	●	●	●		●	●	●		●	●	○
15.0	4.0	9	30°	RFBL-150409-30			●	●		●		●	●	●			●	○
20.0	5.0	8	15°	RFBL-200508-15 **			○	○		○		○	○	○		○	●	○
20.0	5.0	8	30°	RFBL-200508-30 **			○	○		○		○	○	○		○	●	○
20.0	5.0	11	15°	RFBL-200511-15			●	●	●	●	●	●	●	●	●	●	●	○
20.0	5.0	11	30°	RFBL-200511-30			●	●	○	●	○	●	●	●	●	●	●	○
21.5	5.0	8	15°	RFBL-210508-15 **		●	●	●		●		●	●	●	●	●	●	○
21.5	5.0	8	30°	RFBL-210508-30 **		●	●	●		●		●	●	●	●	●	●	○
25.0	5.0	11	15°	RFBL-250511-15		●	●	●	○	●	○	●	●	●	●	●	●	○
25.0	5.0	11	30°	RFBL-250511-30			●	●	○	●	○	●	●	●	●	●	●	○
25.0	6.0	8	15°	RFBL-250608-15 **			●	●		●		●	●	●	●	●	●	○
25.0	6.0	8	30°	RFBL-250608-30 **			●	●	●	●		●	●	●	●	●	●	○

RFBL 30° only for RRTN holder
Pitch 0.13, 0.14, 0.16, 0.35, 0.45 mm on request.
** TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
*** These rolls are compatible with holders of other makes. Further information can be found in our webshop.*

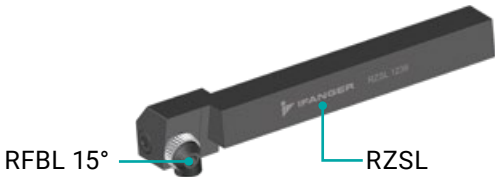


RGE 45° (not standardized)





RAA (DIN 82)
Type A (ISO 13444)



RFBL

Rolls for knurling by cutting made of carbide

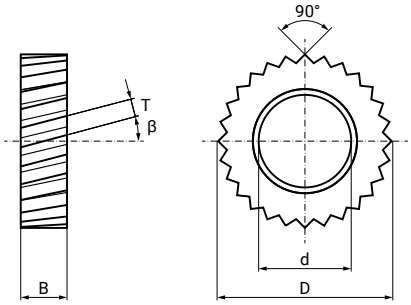
KNURLING BY CUTTING «RF»

CARBIDE

HIGH PERFORMANCE LONG-LASTING

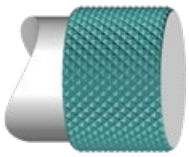


Standard values (V_c/f_n) page 14



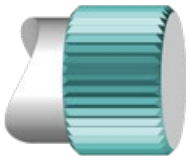
D	B	d	β	Ref. Nº	T						
				mm	0.3	0.4	0.5	0.6	0.7	0.8	1.0
				TPI *	85	64	51	42	36	32	25
8.9	2.5	4	15°	RFBL-090204-00-__-HM **	○	○	○	○	○	○	○
11.0	3.0	6	15°	RFBL-110306-00-__-HM	●	○	●	●	●	●	●
15.0	4.0	9	15°	RFBL-150409-00-__-HM		○	○	●	○	●	●
21.5	5.0	8	15°	RFBL-210508-00-__-HM **			○	○	○	●	○

* *TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
** *These rolls are compatible with holders of other makes. Further information can be found in our webshop.*

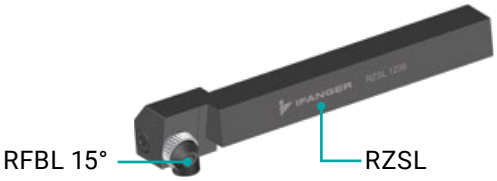


RGE 45° (not standardized)





RAA (DIN 82)
Type A (ISO 13444)



Order directly online
Order the suitable tool easily online via QR code or weblink.
Example of an order-number: RFBL-090204-00-0.3-HM

All cutting rolls can by delivered with 10° chamfers on request.

● Shop-item ○ Available on request

ifanger.com/en/shop

RFBR

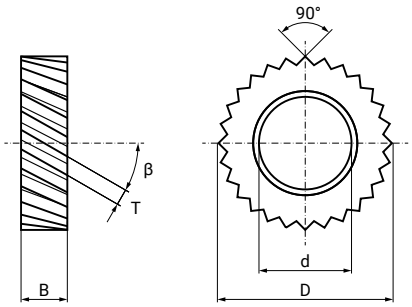
Rolls for knurling by cutting made of HSS





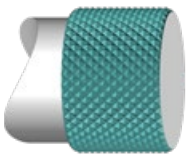


Standard values (V_c/f_n) page 14



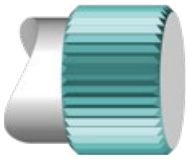
D	B	d	β	Ref. Nº	T												Coating	
				mm	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2	1.5	1.75	2.0	HSS	TIN
				TPI *	85	64	51	42	36	32	28	25	21	17	15	13		
8.9	2.5	4	15°	RFBR-090204-15 **	●	●	●	●	●	●		●	●				●	○
8.9	2.5	4	30°	RFBR-090204-30 **	●	●	●	●	●	●		●	●				●	○
11.0	3.0	6	15°	RFBR-110306-15	●	●	●	●	●	●	●	●	●	●	●		●	○
11.0	3.0	6	30°	RFBR-110306-30	●	●	●	●	●	●		●	●	●			●	○
14.5	3.0	5	15°	RFBR-140305-15 **		●	●	●		●		●	●	●			●	○
14.5	3.0	5	30°	RFBR-140305-30 **		●	●	●		●		●	●	●			●	○
15.0	4.0	8	15°	RFBR-150408-15 **			●	●		●		●	●	●			●	○
15.0	4.0	8	30°	RFBR-150408-30 **			●	●		●		●	●	●			●	○
15.0	4.0	9	15°	RFBR-150409-15	●	●	●	●	●	●		●	●	●		●	●	○
15.0	4.0	9	30°	RFBR-150409-30			●	●		●		●	●	●			●	○
20.0	5.0	8	15°	RFBR-200508-15 **			○	○		○		○	○	○		○	●	○
20.0	5.0	8	30°	RFBR-200508-30 **			○	○		○		○	○	○		○	●	○
20.0	5.0	11	15°	RFBR-200511-15			●	●	●	●	●	●	●	●	●	●	●	○
20.0	5.0	11	30°	RFBR-200511-30			●	●	○	●	○	●	●	●	●	●	●	○
21.5	5.0	8	15°	RFBR-210508-15 **		●	●	●		●		●	●	●	●	●	●	○
21.5	5.0	8	30°	RFBR-210508-30 **		●	●	●		●		●	●	●	●	●	●	○
25.0	5.0	11	15°	RFBR-250511-15		●	●	●	○	●	○	●	●	●	●	●	●	○
25.0	5.0	11	30°	RFBR-250511-30			●	●	○	●	○	●	●	●	●	●	●	○
25.0	6.0	8	15°	RFBR-250608-15 **			●	●		●		●	●	●	●	●	●	○
25.0	6.0	8	30°	RFBR-250608-30 **			●	●	●	●		●	●	●	●	●	●	○

RFBR 30° only for RRTN holder or special holder RXSR-K
Pitch 0.13, 0.14, 0.16, 0.35, 0.45 mm on request.
** TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
*** These rolls are compatible with holders of other makes. Further information can be found in our webshop.*



RGE 45° (not standardized)





RAA (DIN 82)
Type A (ISO 13444)



RFBR

Rolls for knurling by cutting made of carbide

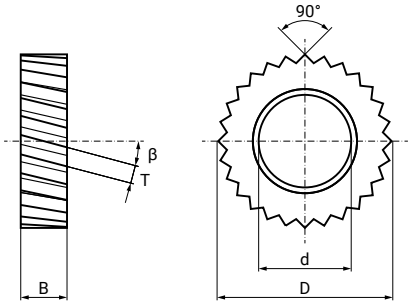
KNURLING BY CUTTING «RF»

CARBIDE

HIGH PERFORMANCE LONG-LASTING

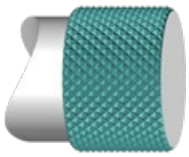


Standard values (V_c/f_n) page 14



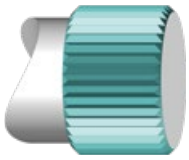
D	B	d	β	Ref. Nº	T						
				mm	0.3	0.4	0.5	0.6	0.7	0.8	1.0
				TPI *	85	64	51	42	36	32	25
8.9	2.5	4	15°	RFBR-090204-00-__-HM **	○	○	○	○	○	○	○
11.0	3.0	6	15°	RFBR-110306-00-__-HM	●	○	●	●	●	●	●
15.0	4.0	9	15°	RFBR-150409-00-__-HM		○	○	●	○	●	●
21.5	5.0	8	15°	RFBR-210508-00-__-HM **			○	○	○	●	○

* *TPI= Number of teeth per 25.4 mm (1 inch); the values are rounded.*
** *These rolls are compatible with holders of other makes. Further information can be found in our webshop.*



RGE 45° (not standardized)





RAA (DIN 82)
Type A (ISO 13444)



Order directly online
Order the suitable tool easily online via QR code or weblink.
Example of an order-number: RFBR-090204-00-0.3-HM

All cutting rolls can by delivered with 10° chamfers on request.

● Shop-item ○ Available on request

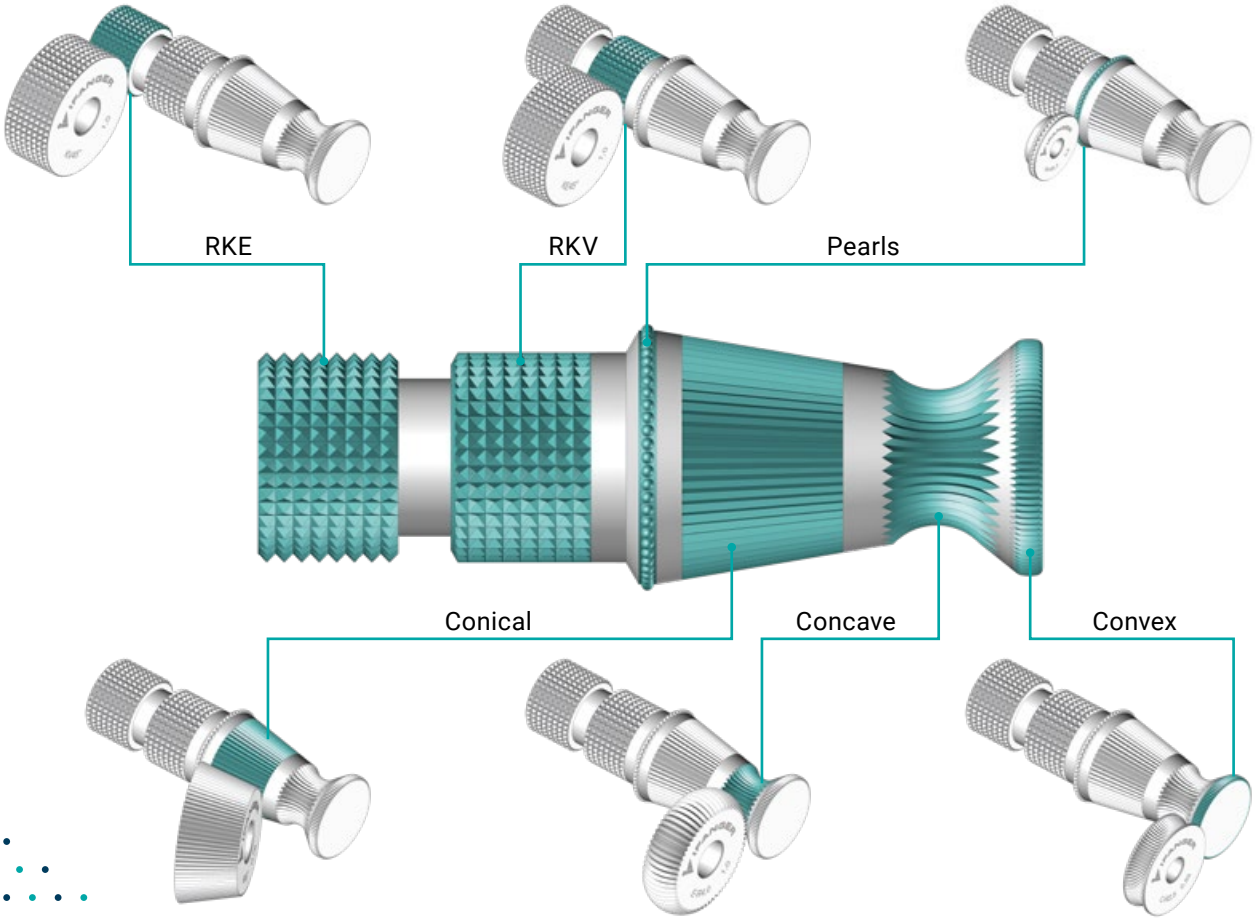
ifanger.com/en/shop

Special knurling rolls

Individual knurling profiles

Swiss precision - your edge in practical use

Deeply rooted in Swiss industrial culture, we stand for the highest quality, reliability, and technical expertise. Our year-long experience is exemplified by numerous successfully completed projects – particularly in the watchmaking, jewelry, and automotive industries. From the initial idea to the finished spcial tool, we accompany you with Swiss diligence and innovative spirit: consulting, development, design, and production – all from a single source and entirely in-house. Efficient, reliable, committed!



Standard knurling rolls with special widths

Standard knurling rolls can be individually adapted to special knurl widths or fitted with custom chamfers within a few working days, as illustrated below.



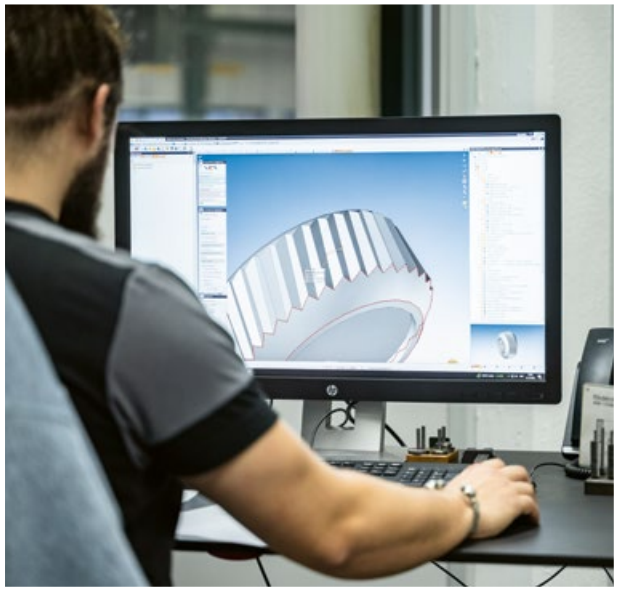


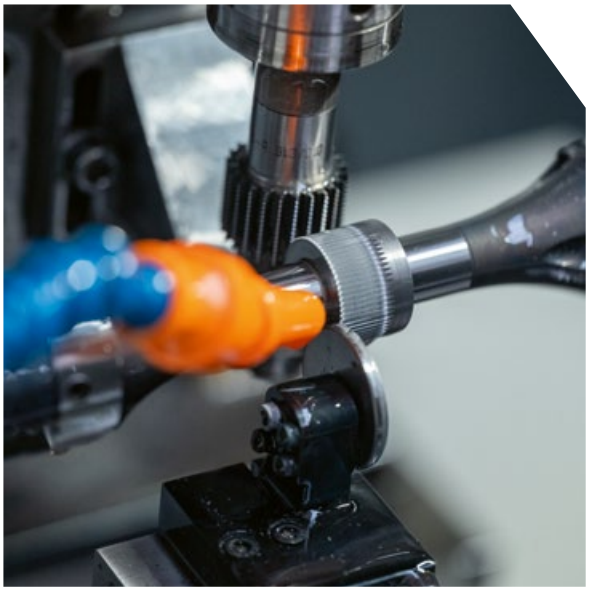


Get in touch

Contact us – our team will gladly provide personal consultation. Together, we'll identify the ideal solution for your specific needs.

ifanger.com/en/contact





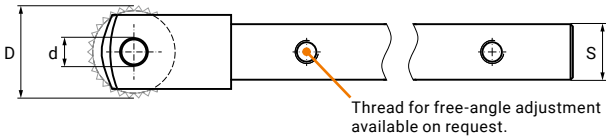
RASN

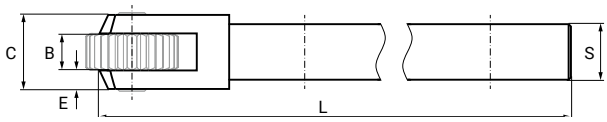
Knurling roll holder for knurling by deformation

KNURLING BY DEFORMATION «RD»

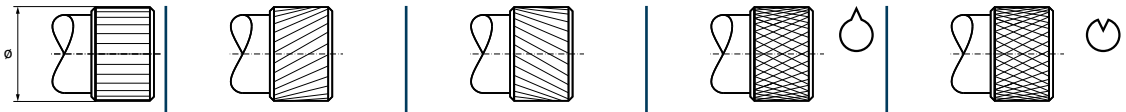


Setup instructions page 62





S	C	E	L	Ref. Nº	D	B	d	ø min.	ø max.
7	8	2.0	120	RASN 0743	8–10	4	3	0.5	15
8	8	2.0	120	RASN 0843	8–10	4	3	0.5	15
7	10	3.0	120	RASN 0744	10–15	4	4	2.0	20
8	10	3.0	120	RASN 0844	10–15	4	4	2.0	20
8	12	3.5	120	RASN 0855	15	5	5	8.0	20
10	10	3.0	120	RASN 1044	10–15	4	4	2.0	20
10	12	3.5	120	RASN 1055	15	5	5	8.0	20
10	16	4.0	160	RASN 1086	20–25	8	6	20.0	120
12	20	5.0	160	RASN 12106	20	10	6	20.0	120
12	12	3.5	120	RASN 1255	15	5	5	8.0	20
12	16	4.0	160	RASN 1286	20–25	8	6	20.0	120
20	20	5.0	160	RASN 20106	20	10	6	20.0	120



β = Helix angle	0°	30°	45°	30°	45°	30°	45°	30°	45°
DIN 82	RAA	RBL	–	RBR	–	RGE	–	RGV	–
ISO 13444	Type A	–	–	–	–	Type B	–	–	–
Knurling roll	RDAA	RDBR-30°	RDBR-45°	RDBL-30°	RDBl-45°	RDGV-30°	RDGV-45°	RDGE-30°	RDGE-45°

Workpiece diameter expansion through material displacement, page 13.

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RASN 0743

ifanger.com/en/shop

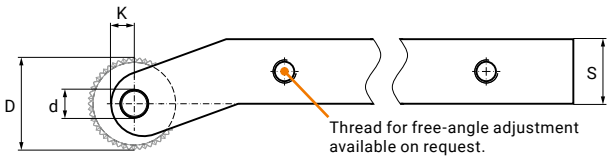
RCSL

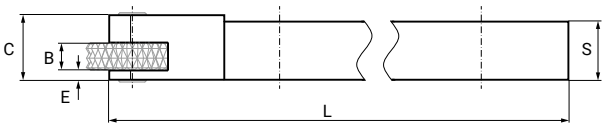
Knurling roll holder for knurling by deformation on Cam-Controlled Lathes

KNURLING BY DEFORMATION «RD»

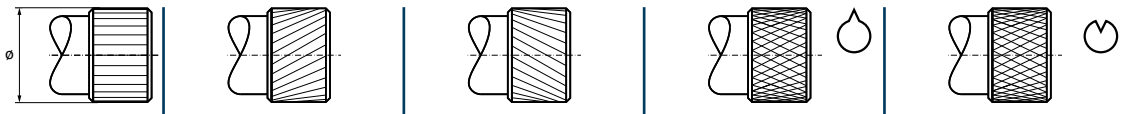
Setup instructions page 62
Spare parts page 58







S	E	C	L	K	Ref. Nº	D	B	d	ø min.	ø max.
6	1.5	10	120	3.3	RCSL 0633	8–10	3	3	0.5	15
7	1.5	10	120	3.3	RCSL 0733	8–10	3	3	0.5	15
7	1.5	11	120	3.3	RCSL 0743	8–10	4	3	0.5	15
8	1.5	10	120	3.3	RCSL 0823	10	2	3	2.0	20
8	1.5	10	120	3.3	RCSL 0833	8–10	3	3	0.5	15
8	1.5	11	120	3.3	RCSL 0843	8–10	4	3	0.5	15
8	1.5	11	120	3.9	RCSL 0844	10–15	4	4	2.0	20
8	1.5	13	120	3.9	RCSL 0855	15	5	5	2.0	20
10	1.5	10	135	3.4	RCSL 1033	8–10	3	3	0.5	15
10	1.5	11	135	4.1	RCSL 1044	10–15	4	4	2.0	20
10	2.0	13	135	4.1	RCSL 1055	15	5	5	8.0	20
12	2.0	12	150	4.1	RCSL 1244	10–15	4	4	2.0	20
12	2.0	13	150	4.1	RCSL 1254	15	5	4	8.0	20
12	2.0	13	150	4.1	RCSL 1255	15	5	5	8.0	20
14	2.0	14	150	5.0	RCSL 1444	10–15	4	4	2.0	20
14	2.0	14	150	5.0	RCSL 1455	15	5	5	8.0	20
14	2.0	14	150	5.0	RCSL 1466	20	6	6	20.0	120



β = Helix angle	0°	30°	45°	30°	45°	30°	45°	30°	45°
DIN 82	RAA	RBL	–	RBR	–	RGE	–	RGV	–
ISO 13444	Type A	–	–	–	–	Type B	–	–	–
Knurling roll	RDAA	RDBR-30°	RDBR-45°	RDBL-30°	RDBl-45°	RDGV-30°	RDGV-45°	RDGE-30°	RDGE-45°

Workpiece diameter expansion through material displacement, page 13.

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RCSL 0633

ifanger.com/en/shop

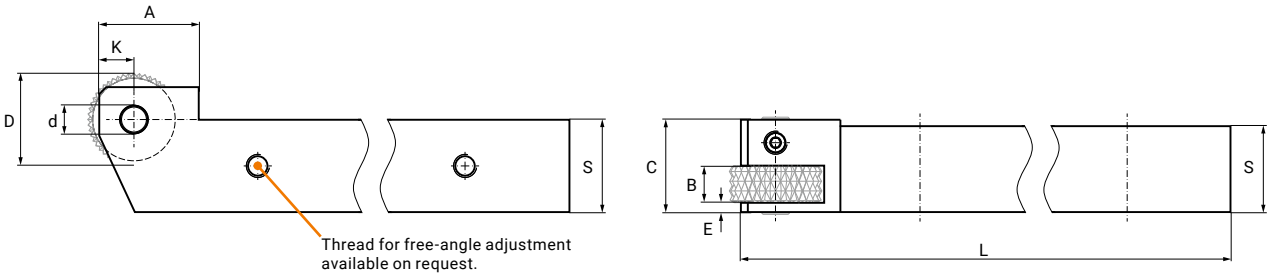
RCSR

Knurling roll holder for knurling by deformation

KNURLING BY DEFORMATION «RD»



Setup instructions page 62
Spare parts page 59

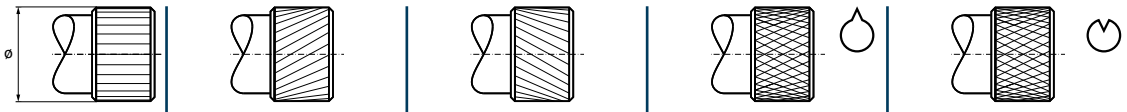


S	E	C	L	A	K	Ref. Nº	D	B	d	ø min.	ø max.
8	1.5	10	100	11.0	3.0	RCSR 0823	8–10	2	3	0.5	15
8	1.5	10	100	11.0	3.0	RCSR 0833	8–10	3	3	0.5	15
8	1.5	11	100	11.0	3.0	RCSR 0843	8–10	4	3	0.5	15
8	1.5	11	100	13.0	4.0	RCSR 0844	10–12	4	4	2.0	15
8	1.5	13	100	16.5	5.0	RCSR 0855	15	5	5	8.0	20
10	1.5	10	100	11.0	3.0	RCSR 1023	8–10	2	3	0.5	15
10	1.5	10	100	11.0	3.0	RCSR 1033	8–10	3	3	0.5	15
10	1.5	11	100	14.5	4.0	RCSR 1044	10–15	4	4	2.0	20
10	2.0	13	100	16.5	5.0	RCSR 1055	15	5	5	8.0	20
12	1.5	12	100	11.0	3.0	RCSR 1233	8–10	3	3	0.5	15
12	2.0	12	115	15.0	4.0	RCSR 1244	10–15	4	4	2.0	20
12	2.0	13	115	17.0	6.0	RCSR 1254	15	5	4	8.0	20
12	2.0	13	115	17.0	6.0	RCSR 1255	15	5	5	8.0	20
12	2.0	18	115	21.5	7.5	RCSR 1286	20	8	6	20.0	120
16	2.0	16	120	15.0	4.0	RCSR 1644	10–15	4	4	8.0	20
16	2.0	16	120	17.0	6.0	RCSR 1654	15	5	4	8.0	20
16	2.0	16	120	17.0	6.0	RCSR 1655	15	5	5	8.0	20
16	2.0	20	120	17.0	6.0	RCSR 1664	15	6	4	8.0	20
16	2.0	20	120	21.5	7.5	RCSR 1686	20	8	6	20.0	120
20	2.0	20	120	17.0	6.0	RCSR 2055	15	5	5	8.0	20
20	2.0	20	120	17.0	6.0	RCSR 2064	15	6	4	8.0	20
20	2.0	20	120	21.5	7.5	RCSR 2066	20	6	6	20.0	120
20	2.0	20	120	21.5	7.5	RCSR 2086	20	8	6	20.0	120
20	2.5	20	120	21.5	7.5	RCSR 20106	20	10	6	20.0	120
25	2.0	25	150	25.0	7.5	RCSR 2586	20–25	8	6	20.0	120

Order directly online
Order the suitable tool easily online via QR code or weblink.

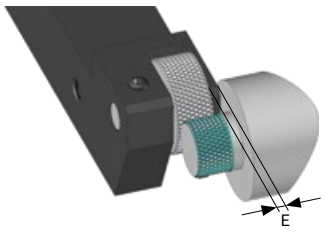
Example of an order-number: RCSR 0823

ifanger.com/en/shop



β = Helix angle	0°	30°	45°	30°	45°	30°	45°	30°	45°
DIN 82	RAA	RBL	–	RBR	–	RGE	–	RGV	–
ISO 13444	Type A	–	–	–	–	Type B	–	–	–
Knurling roll	RDAA	RDBR-30°	RDBR-45°	RDBL-30°	RDBl-45°	RDGV-30°	RDGV-45°	RDGE-30°	RDGE-45°

Workpiece diameter expansion through material displacement, page 13.



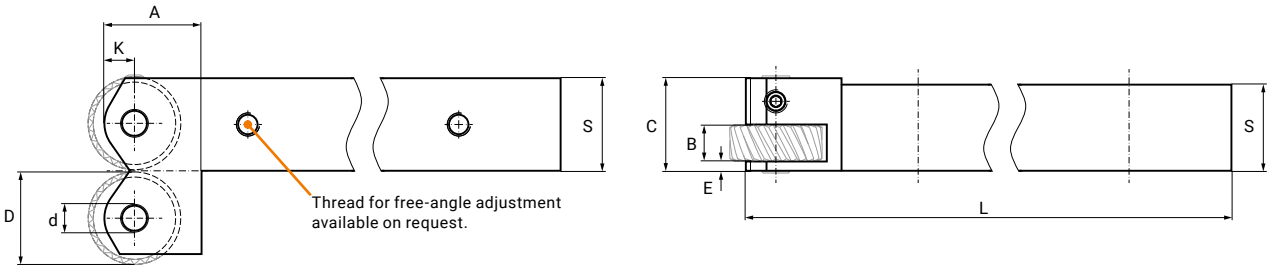
RCDL

Knurling roll holder for knurling by deformation

KNURLING BY DEFORMATION «RD»

Setup instructions page 62
Spare parts page 60

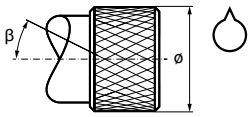


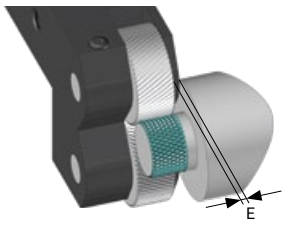


S	C	E	L	A	K	Ref. Nº	D	B	d	ø min.	ø max.
6	10	1.5	120	10.0	3.0	RCDL 0633/08	8	3	3	0.5	2
7	10	1.5	120	10.0	3.0	RCDL 0733/08	8	3	3	0.5	2
7	11	1.5	120	10.0	3.0	RCDL 0743/08	8	4	3	0.5	2
8	10	1.5	135	10.0	3.0	RCDL 0833/08	8	3	3	0.5	2
8	10	1.5	135	11.5	3.5	RCDL 0833/10	10	3	3	2.0	8
8	12	1.5	135	10.0	3.0	RCDL 0843/08	8	4	3	0.5	2
10	10	1.5	135	10.0	3.0	RCDL 1033/08	8	3	3	0.5	2
10	10	1.5	135	11.5	3.5	RCDL 1033/10	10	3	3	2.0	8
10	12	1.5	135	10.0	3.0	RCDL 1043/08	8	4	3	0.5	2
10	12	2.0	135	11.5	3.5	RCDL 1044/10	10	4	4	2.0	8
12	12	2.0	135	11.5	3.5	RCDL 1244/10	10	4	4	2.0	8

β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Knurling roll	RDBL-30°	RDBL-45°
Knurling roll	RDBR-30°	RDBR-45°

Workpiece diameter expansion through material displacement, page 13.





Order directly online
Order the suitable tool easily online via QR code or weblink.

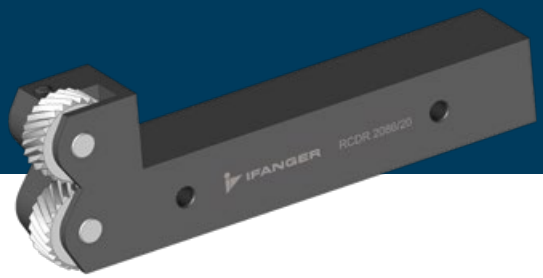
Example of an order-number: RCDL 0633/08

ifanger.com/en/shop

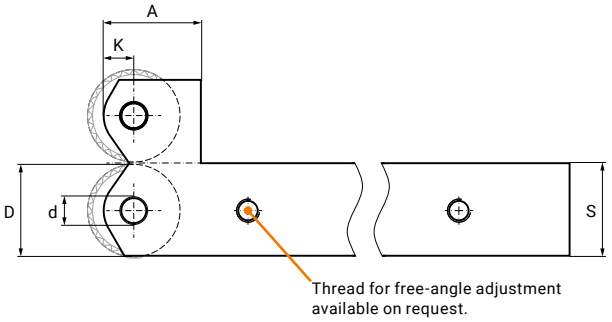
RCDR

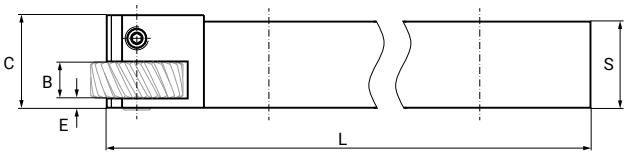
Knurling roll holder for knurling by deformation

KNURLING BY DEFORMATION «RD»



Setup instructions page 62
Spare parts page 61

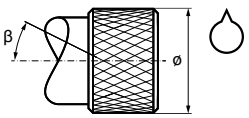


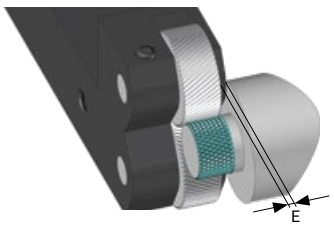


S	C	E	L	A	K	Ref. N°	D	B	d	ø min.	ø max.
8	10	1.5	100	10	3.0	RCDR 0833/08	8	3	3	0.5	2
8	10	1.5	100	12	3.5	RCDR 0833/10	10	3	3	2.0	8
8	12	1.5	100	12	3.5	RCDR 0843/10	10	4	3	2.0	8
10	10	1.5	100	10	3.0	RCDR 1033/08	8	3	3	0.5	2
10	10	1.5	100	12	3.5	RCDR 1033/10	10	3	3	2.0	8
10	12	2.0	100	12	3.5	RCDR 1043/10	10	4	3	2.0	8
10	12	2.0	100	12	4.0	RCDR 1044/10	10	4	4	2.0	8
12	12	2.0	115	12	4.0	RCDR 1244/10	10	4	4	2.0	8
12	12	2.0	115	18	5.0	RCDR 1244/15	15	4	4	8.0	20
12	12	2.0	115	18	5.5	RCDR 1254/15	15	5	4	8.0	20
12	12	2.0	115	18	5.5	RCDR 1255/15	15	5	5	8.0	20
16	16	2.0	120	18	5.5	RCDR 1644/15	15	4	4	8.0	20
16	16	2.0	120	18	5.5	RCDR 1654/15	15	5	4	8.0	20
16	16	2.0	120	18	5.5	RCDR 1655/15	15	5	5	8.0	20
16	16	2.0	120	18	5.5	RCDR 1664/15	15	6	4	8.0	20
20	20	2.0	120	18	5.5	RCDR 2044/15	15	4	4	8.0	20
20	20	2.0	120	18	5.5	RCDR 2054/15	15	5	4	8.0	20
20	20	2.0	120	18	5.5	RCDR 2064/15	15	6	4	8.0	20
20	20	2.0	120	21	6.5	RCDR 2066/20	20	6	6	20.0	120
20	20	2.0	120	21	6.5	RCDR 2086/20	20	8	6	20.0	120
25	25	2.0	150	26	9.0	RCDR 2586/25	25	8	6	20.0	120

β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Knurling roll	RDBL-30°	RDBL-45°
Knurling roll	RDBR-30°	RDBR-45°

Workpiece diameter expansion through material displacement, page 13.





Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RCDR 0833/08

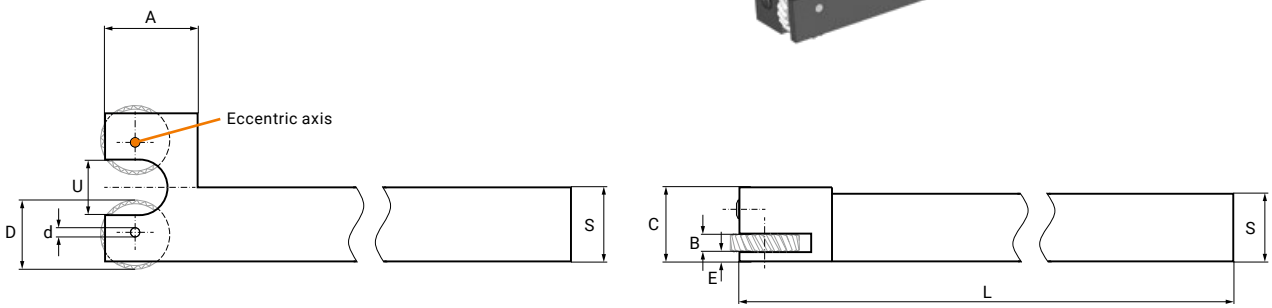
ifanger.com/en/shop

RVDR

Knurling roll holder for knurling by deformation

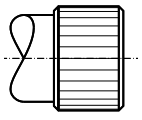
KNURLING BY DEFORMATION «RD»

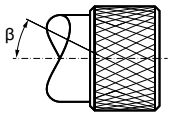




S	A	C	E	L	U	Ref. Nº	D	B	d	ø Werkstück	
8	15.0	14	2	100	4.0	RVDR 0833/10-1,0 *	10	3	3	1.0	± 0.3
12	15.0	14	2	120	5.0	RVDR 1233/10-1,0 *	10	3	3	1.0	± 0.3
8	15.0	14	2	120	5.0	RVDR 0833/10-1,5 *	10	3	3	1.5	± 0.3
12	18.0	14	2	110	5.3	RVDR 1233/10-1,6 *	10	3	3	1.6	± 0.3
8	15.0	14	2	120	5.5	RVDR-0833/10-2,0 *	10	3	3	2.0	± 0.3
10	15.0	14	2	100	4.0	RVDR 1033/10-2.02 *	10	3	3	2.0	± 0.3
10	16.0	14	2	120	6.0	RVDR-1033/10-2,0 *	10	3	3	2.0	± 0.3
12	17.0	14	2	110	6.3	RVDR 1233/10-2,0 *	10	3	3	2.0	± 0.3
8	15.0	14	2	100	5.5	RVDR-0833/10-2,5 *	10	3	3	2.5	± 0.3
10	16.0	14	2	120	6.0	RVDR-1033/10-2,5 *	10	3	3	2.5	± 0.3
12	15.0	14	2	120	6.8	RVDR 1233/10-2,5 *	10	3	3	2.5	± 0.3
8	15.0	14	2	100	6.0	RVDR-0833/10-3,0 *	10	3	3	3.0	± 0.3
10	16.5	14	2	100	6.0	RVDR-1033/10-3,0 *	10	3	3	3.0	± 0.3
12	15.0	14	2	120	6.3	RVDR 1233/10-3,0 *	10	3	3	3.0	± 0.3
12	15.0	14	2	120	6.0	RVDR 1233/10-3,5 *	10	3	3	3.5	± 0.3
8	17.0	14	2	100	7.0	RVDR 0833/10-4,0 *	10	3	3	4.0	± 0.3
10	16.5	14	2	100	6.0	RVDR-1033/10-4,0 *	10	3	3	4.0	± 0.3
12	15.0	14	2	120	6.0	RVDR 1233/10-4,0 *	10	3	3	4.0	± 0.3
12	15.0	14	2	120	7.0	RVDR 1233/10-5,0 *	10	3	3	5.0	± 0.3
12	15.0	14	2	120	9.0	RVDR 1233/10-6,0 *	10	3	3	6.0	± 0.3
8	16.0	14	2	120	8.5	RVDR 1033/10-6,0 *	10	3	3	6.0	± 0.3
12	16.0	14	2	120	10.0	RVDR 1233/10-7,0 *	10	3	3	7.0	± 0.3
10	25.0	16	2	120	13.0	RVDR-1044/15-8,0 **	15	4	3	8.0	± 0.4

Workpiece β	0°	30°	45°
Knurling roll 1	RDAA-0°	RDBL-30°	RDBL-45°
Knurling roll 2	RDAA-0°	RDBR-30°	RDBR-45°





RGE 30° (DIN 82)
Type B (ISO 13444)
RGE 45° (not standardized)

Spare part for eccentric shaft: *REVA-0314-SX; **REVA-0416-SX

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RVDR 0833/10-1,0

ifanger.com/en/shop

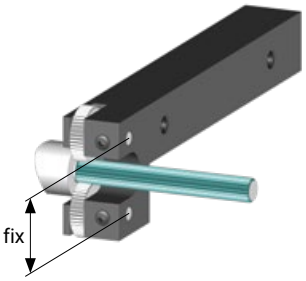
RVDR

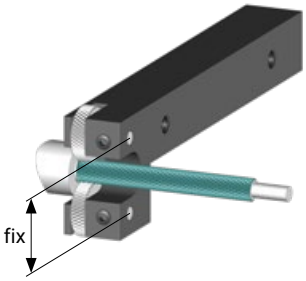
Setup instructions

Your benefits at a glance

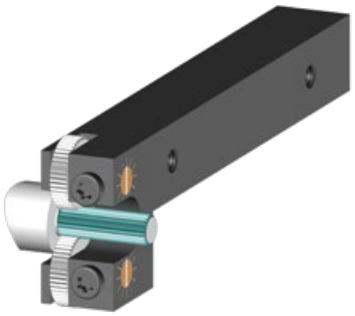
- Ideal for long knurling on small workpiece diameters
- Dimensional stability is maintained even with long knurling lengths
- Minimal bending forces on the workpiece
- Perfect for applications with limited space
- Knurling up to the shoulder of the workpiece

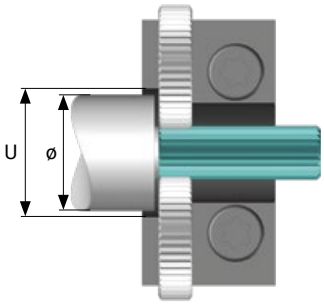
The RVDR holder with adjustable knurling diameter is ideal for small batch sizes and allows precise empirical determination of the optimal center distance between the knurling rolls. For large production volumes, holders with a fixed center distance are available, simplifying setup and roll changes.



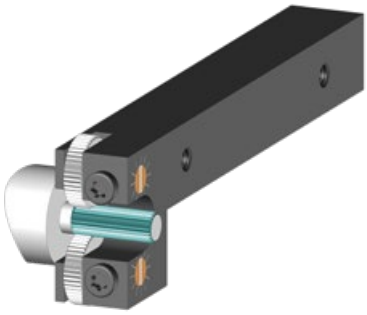


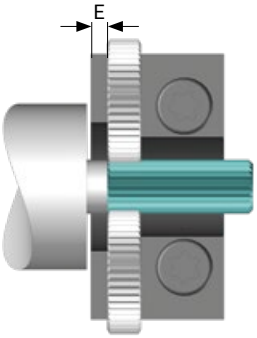
Knurled area up to the workpiece shoulder
The fork opening "U" must be larger than the diameter of the workpiece shoulder.





The dimension "E" must be observed if the fork opening "U" is smaller than the diameter of the workpiece shoulder.





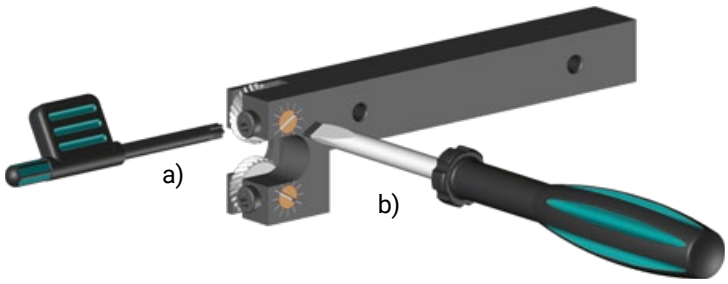
RVDR

Setup instructions

Setting the center distances of the knurling rolls

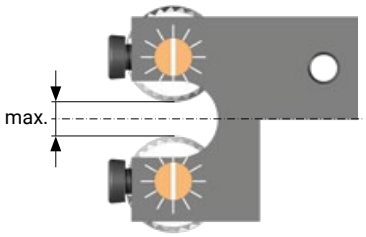
Adjusting screws on the holder

a) Fixing knurling rolls spacing
b) Setting the knurling rolls distance



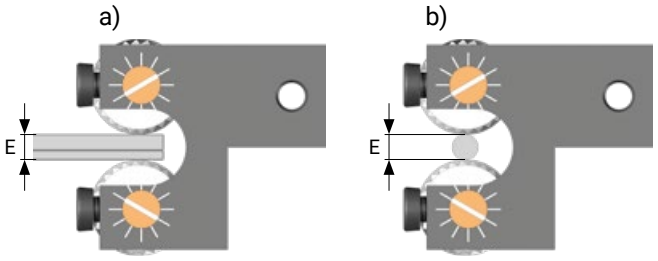
1. Open Knurling rolls spacing

Fully open the gap between the knurling wheels



2. Setting the knurling rolls spacing

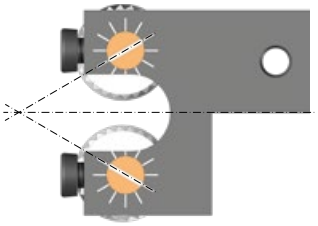
a) With gauge blocks, outside the machine
b) With workpiece, on the machine



E = Knurled diameter of the workpiece minus pitch.
Example:
E = 6 mm (knurl diameter) – 0.5 mm (pitch) = 5.5 mm

3. Fixing

Ensure that the knurling axes are symmetrically aligned with each other and with the center of the fork. Additionally, the direction of the axle slots must match the illustration.





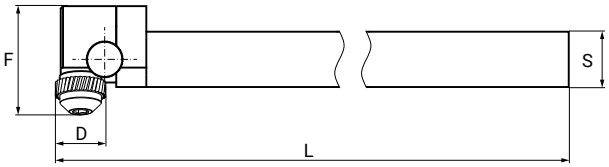
RZSR

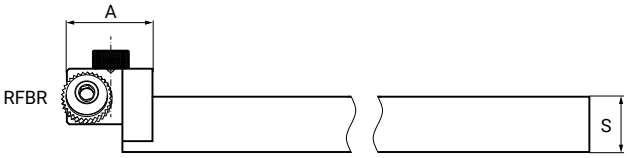
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»

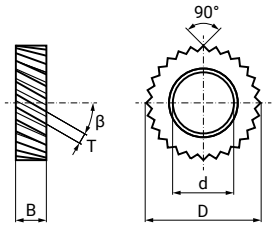


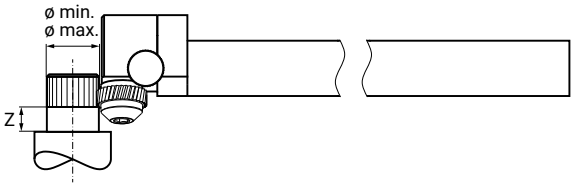
Setup instructions page 64
Spare parts page 57



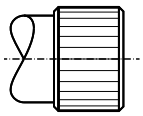


S	L	F	A	Ref. Nº	D	B	d	ø min.	ø max.	Shoulder clearance Z
10	110	24	19	RZSR 1036	11	3	6	3	8	4.0
12	110	24	19	RZSR 1236	11	3	6	3	8	4.0
16	110	31	25	RZSR 1649	15	4	9	8	20	6.0
20	130	36	30	RZSR 20511	20	5	11	20	120	6.5
25	130	41	35	RZSR 25511	25	5	11	20	120	7.5





DIN 82	RAA
ISO 13444	Type A
Cutting rolls	RFBR 15°





Adjusting screw for fine-tuning the knurled profile – see video.

ifanger.com/RZS_Knurl

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RZSR 1036

ifanger.com/en/shop

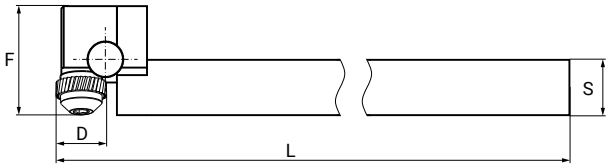
RZSR-K

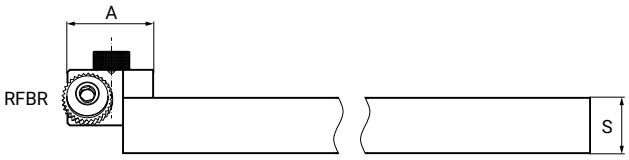
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»

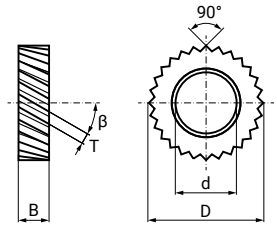


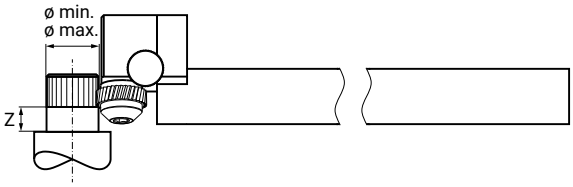
Setup instructions page 64
Spare parts page 57



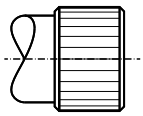


S	L	F	A	Ref. Nº	D	B	d	ø min.	ø max.	Shoulder clearance Z
8	100	24	19	RZSR 0836-K	11	3	6	3	8	4.0
10	110	24	19	RZSR 1036-K	11	3	6	3	8	4.0
12	110	24	19	RZSR 1236-K	11	3	6	3	8	4.0
16	110	24	19	RZSR 1636-K	11	3	6	3	8	6.0
16	110	31	19	RZSR 1649-K	15	4	9	8	20	6.5





DIN 82	RAA
ISO 13444	Type A
Cutting rolls	RFBR 15°





Adjusting screw for fine-tuning the knurled profile – see video.

ifanger.com/RZS_Knurl

Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RZSR 0836-K

ifanger.com/en/shop

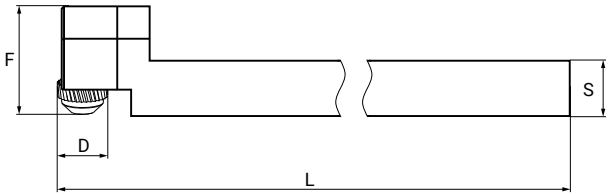
RZSL

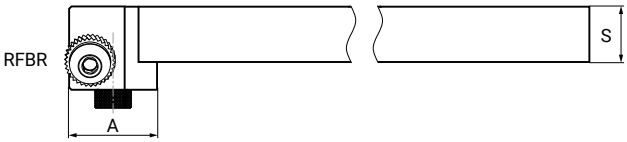
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»

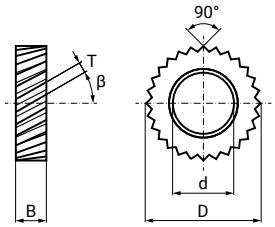


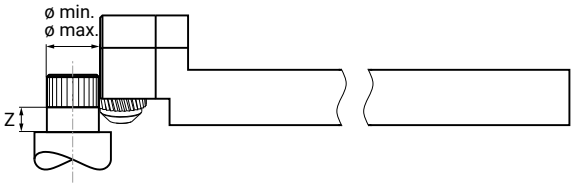
Setup instructions page 64
Spare parts page 57



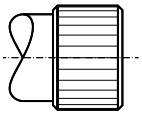


S	L	F	A	Ref. N°	D	B	d	ø min.	ø max.	Shoulder clearance Z
8	135	18	18	RZSL 0836	11	3	6	3	8	4.0
10	135	18	18	RZSL 1036	11	3	6	3	8	4.0
12	135	21	24	RZSL 1236	11	3	6	3	8	4.0





DIN 82	RAA
ISO 13444	Type A
Cutting rolls	RFBL 15°



Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RZSL 0836

ifanger.com/en/shop



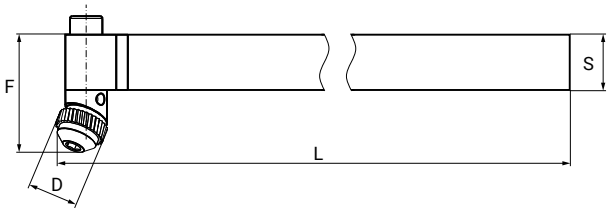
RKDR

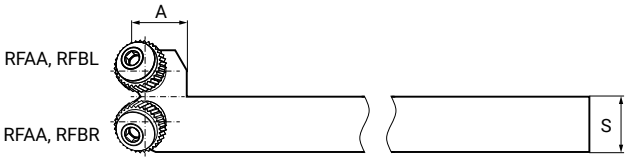
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»

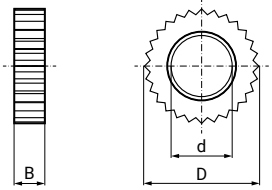


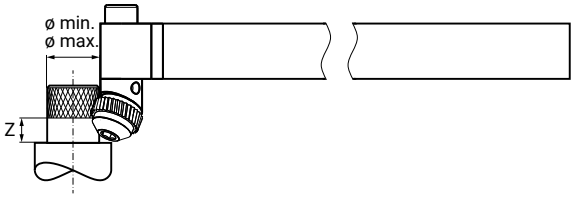
Setup instructions page 64
Spare parts page 56





S	L	F	A	Ref. Nº	D	B	d	ø min.	ø max.
10	90	27	14	RKDR 1036	11	3	6	3	40
12	90	27	14	RKDR 1236	11	3	6	3	40
16	110	24	20	RKDR 1649	15	4	9	4	60
20	130	49	23	RKDR 20511	20	5	11	6	100
25	150	62	35	RKDR 25511	25	5	11	6	250





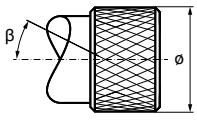
ø Workpiece / Ref. Nº	4	6	8	10	15	20	25	30	40	50	80
	Shoulder clearance Z										
RKDR 1036	5.5	4.5	4.0	6.0	5.0	4.5	4.0	4.5			
RKDR 1236	5.5	5.0	6.0	5.5	6.0	6.0	5.5	5.5	6.5	5.5	
RKDR 1649	7.0	7.5	8.0	7.5	6.5	7.0	6.5	6.5	6.5	7.0	
RKDR 20511		8.5	8.0	8.5	8.0	7.5	7.5	8.0	7.5	8.0	
RKDR 25511											

Workpiece diameter increased through material displacement, page 64.

Setup instructions

ifanger.com/RKD_Knurl

β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Upper roll	RFAA	RFBL-15°
Lower roll	RFAA	RFBR-15°



Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RKDR 1036

ifanger.com/en/shop

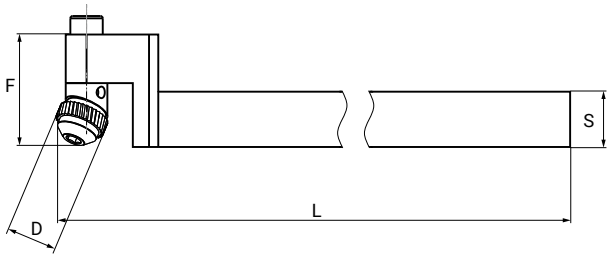
RKDR-K

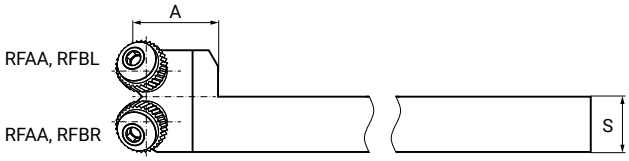
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»



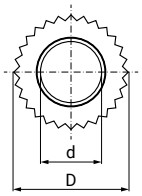
Setup instructions page 64
Spare parts page 56

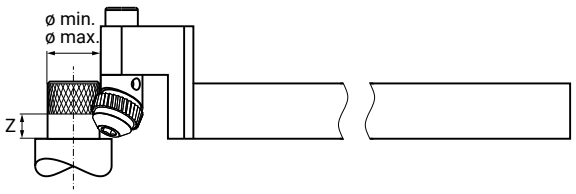




S	L	F	A	Ref. Nº	D	B	d	ø min.	ø max.
8	110	24	20	RKDR 0836-K	11	3	6	3	40
10	110	24	20	RKDR 1036-K	11	3	6	3	40
12	110	24	20	RKDR 1236-K	11	3	6	3	40
16	105	39	17	RKDR 1636-K	11	3	6	3	40
16	115	35	25	RKDR 1649-K	15	4	9	4	60





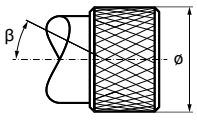


ø Workpiece / Ref. Nº	4	6	8	10	15	20	25	30	40	50	80
	Indicative values for shoulder clearance Z										
RKDR 0836-K	5.5	4.5	4.0	6.0	5.0	4.5	4.0	4.5			
RKDR 1036-K	5.5	4.5	4.0	6.0	5.0	4.5	4.0	4.5			
RKDR 1236-K	5.5	5.0	6.0	5.5	6.0	6.0	5.5	5.5	6.5	5.5	
RKDR 1636-K	5.5	5.0	6.0	5.5	6.0	6.0	5.5	5.5	6.5	5.5	
RKDR 1649-K	7.0	7.5	8.0	7.5	6.5	7.0	6.5	6.5	6.5	7.0	

Workpiece diameter increased through material displacement, page 64.



β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Upper roll	RFAA	RFBL-15°
Lower roll	RFAA	RFBR-15°



Order directly online
Order the suitable tool easily online via QR code or weblink.

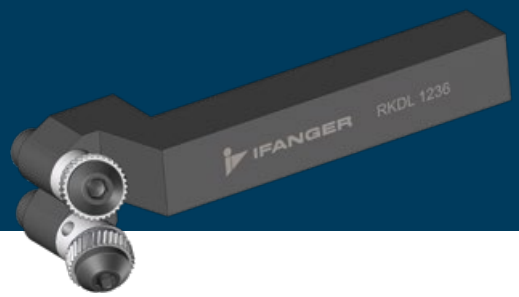
Example of an order-number: RKDR 0836-K

ifanger.com/en/shop

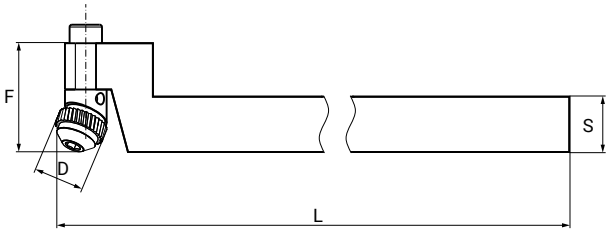
RKDL

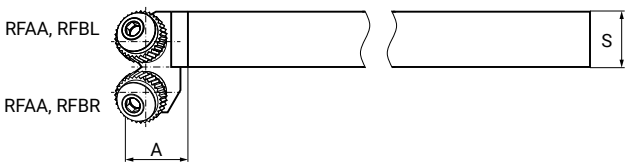
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»

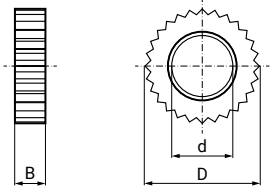


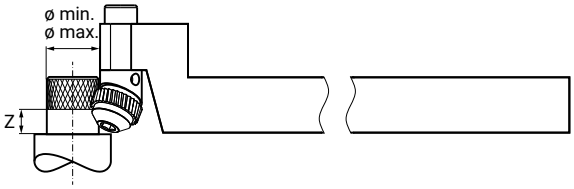
Setup instructions page 64
Spare parts page 56





S	L	F	A	Ref. Nº	D	B	d	ø min.	ø max.
8	135	22	18	RKDL 0836	11	3	6	3	40
10	135	24	18	RKDL 1036	11	3	6	3	40
12	135	24	21	RKDL 1236	11	3	6	3	40





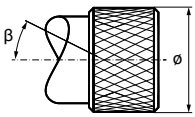
ø Workpiece	4	6	8	10	15	20	25	30	40	50	80
Ref. Nº	Shoulder clearance Z										
RKDR 1036	5.5	4.5	4.0	6.0	5.0	4.5	4.0	4.5			
RKDR 1236	5.5	5.0	6.0	5.5	6.0	6.0	5.5	5.5	6.5	5.5	
RKDR 1649	7.0	7.5	8.0	7.5	6.5	7.0	6.5	6.5	6.5	7.0	
RKDR 20511		8.5	8.0	8.5	8.0	7.5	7.5	8.0	7.5	8.0	
RKDR 25511											

Workpiece diameter increased through material displacement, page 64.

Setup instructions

ifanger.com/RKD_Knurl

β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Upper roll	RFAA	RFBL-15°
Lower roll	RFAA	RFBR-15°



Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RKDL 0836

ifanger.com/en/shop

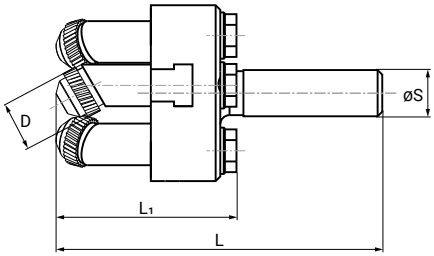


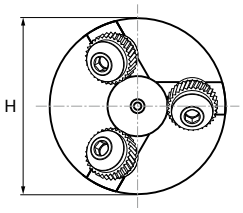
RRTN

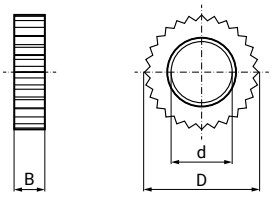
Knurling roll holder for knurling by cutting

KNURLING BY CUTTING «RF»



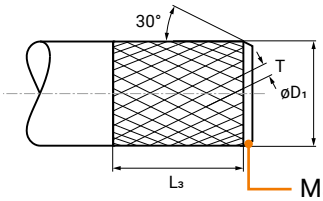




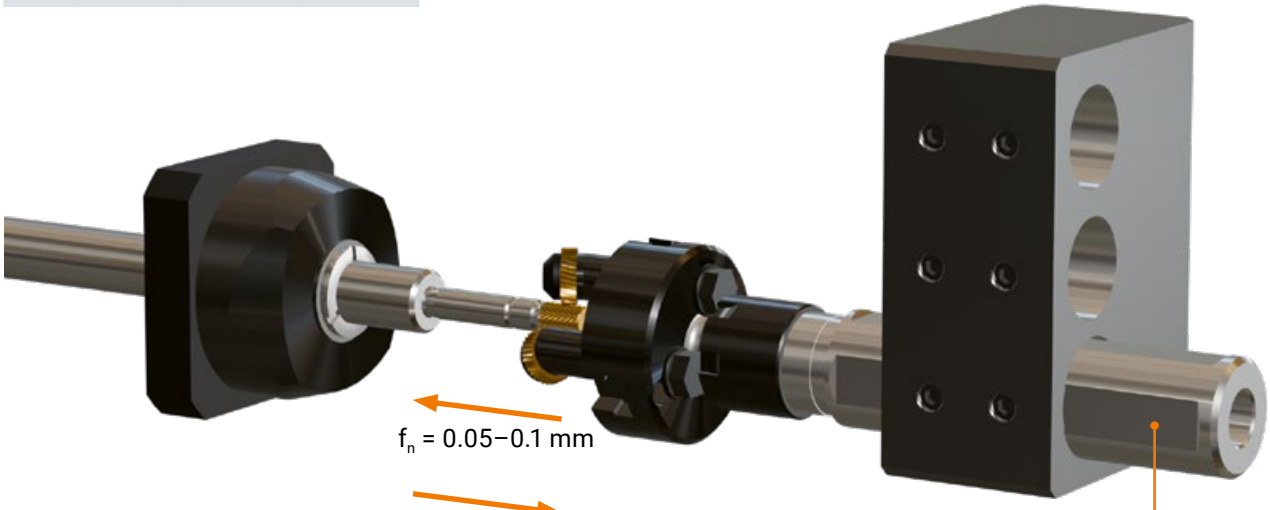


øS	L	L1	H	Ref. Nº	D	B	d	øD1 min.	øD1 max.	L3 max.
10	71	41	38	RRTN 1036	11	3	6	3	12	20
12	97	55	52	RRTN 1249	15	4	9	6 20	19 20	35 20
20	133	77	70	RRTN 20511	20	5	11	8 25	24 33	45 20

β = Helix angle	30°	45°
DIN 82	RGE	–
ISO 13444	Type B	–
Knurling roll 1	RFAA -0°	RFBR-15°
Knurling roll 2	RFAA -0°	RFBR-15°
Knurling roll 3	RFAA -0°	RFBL-15°



Machine a 30° chamfer before knurling.



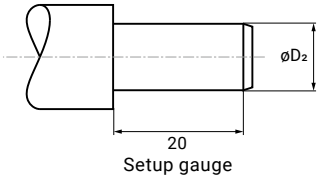
Order directly online
Order the suitable tool easily online via QR code or weblink.

Example of an order-number: RRTN 1036

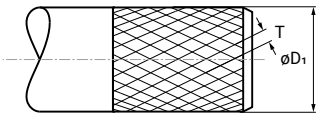
ifanger.com/en/shop

Setup instructions

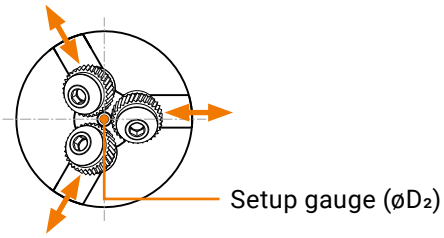
1. Machine a setup gauge (mandril) according to this drawing.
   $D_2 = D_1 - \delta$

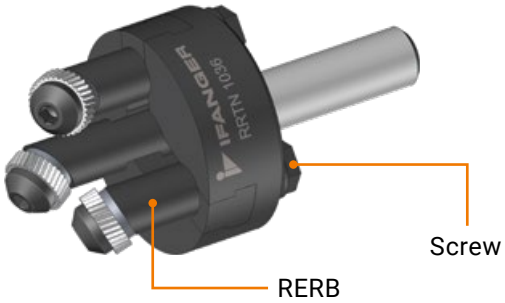


Pitch T	0.30	0.40	0.50	0.60	0.70	0.80	1.00	1.20	1.50
Delta δ	0.25	0.30	0.40	0.50	0.55	0.60	0.80	1.00	1.20

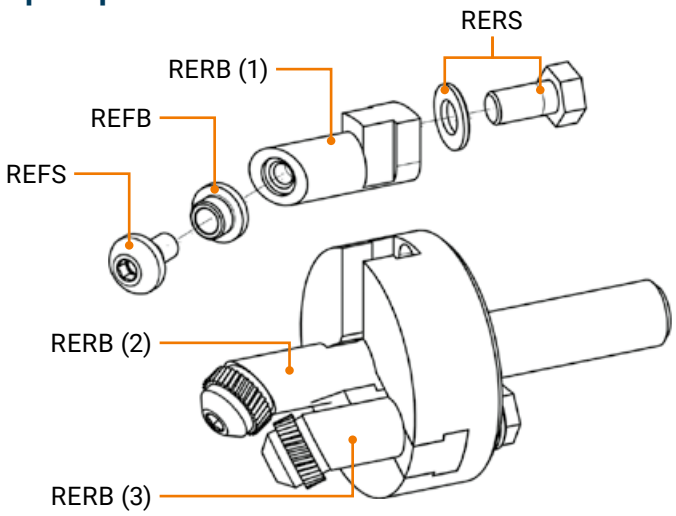


2. Set the 3 rolls evenly on the setup gauge and tighten the RERB.





Spare parts



Detailed information about the spare parts are available in our webshop.

Special holders

Simple and quick setup

Standard holders from the catalog often reach their limits in certain machine installation situations and may not be usable. That's why we also manufacture customized holders – precisely tailored to your application. Thanks to our fully in-house design and production, special holders – even as single units – can be realized within just a few working days.

Hundreds of satisfied customers already benefit from this flexibility. Contact us – we'll be happy to advise you.

Examples of special holders

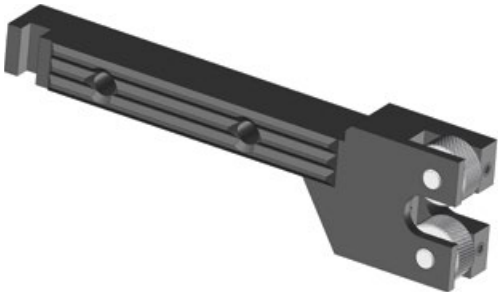


Machine-specific holders, including the RTDL model for TORNOS cam-controlled lathes.

You can find other holders for specific machine brands in the webshop by entering the corresponding name in the search field.



Holder with integrated coolant supply for improved cooling, lubrication and effective chip removal.



Holder with application-specific fastening system.

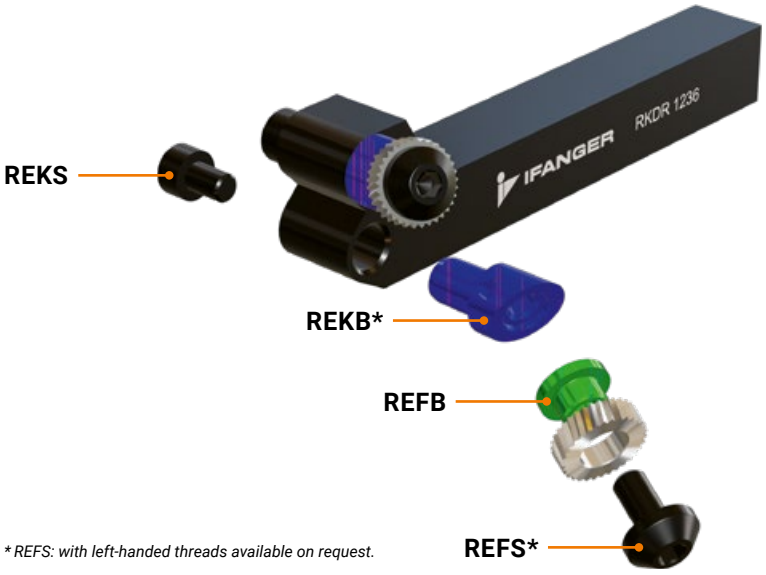
Example in the picture:
Applitec MODU-Line® Interface.



Holder and rolls for precise knurl shaping flush with the workpiece shoulder.


IFANGER

Spare parts
for holders RKD…



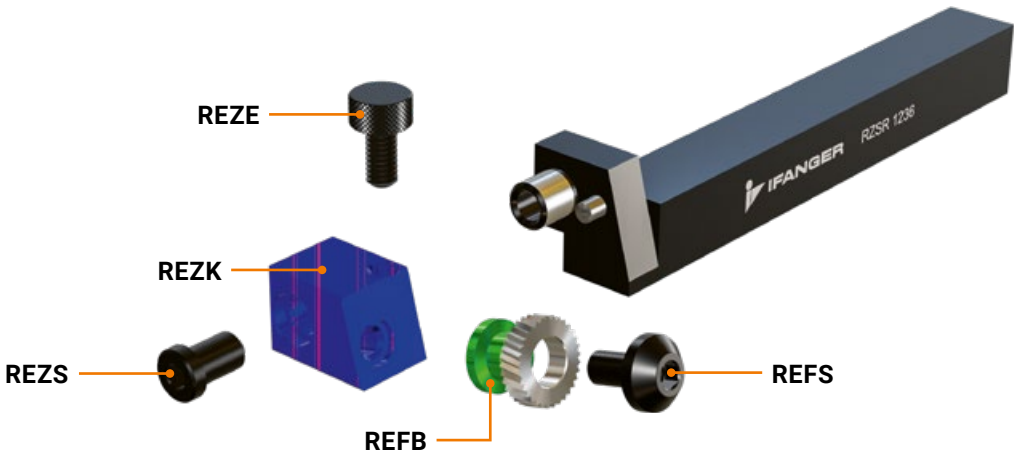
** REFS: with left-handed threads available on request.*

Holder	0836	1036	1236	1636	1649	20511	25511	Ref. Nº
L	RKDL 0836	RKDL 1036	RKDL 1236					REFB-0036
R		RKDR 1036	RKDR 1236					REFS-0036
R-K	RKDR 0836-K	RKDR 1036-K	RKDR 1236-K	RKDR 1636-K				REKB-0036
								REKS-0036
L					RKDL 1649			REFB-1049
R					RKDR 1649			REFS-1049
R-K					RKDR 1649-K			REKB-1049
								REKS-1049
L								REFB-2511
R						RKDR 20511		REFS-2511
R-K								REKB-2511
								REKS-2511
L								REFB-3511
R							RKDR 25511	REFS-3511
R-K								REKB-3511
								REKS-3511

More spare parts

ifanger.com/spare_knurl-en

Spare parts
for holders RZS...



Holder	0836	1036	1236	1636	1649	20211	25511	Ref. Nº
L	RZSL 0836							REFB-0036
R								REFS-0036
R-K								REZE-0036L
								REZK-0036L
								REZS-0036
L		RZSL 1036						REFB-0036
R								REFS-0036
R-K								REZE-0136
								REZK-0136
								REZS-0036
L			RZSL 1236					REFB-0036
R								REFS-0036
R-K								REZE-0136
								REZK-0236
								REZS-0036
L								REFB-0036
R								REFS-0036
R-K	RZSR 0836-K	RZSR 1036-K	RZSR 1236-K	RZSR 1636-K	RZSR 1649-K			REZE-0036
								REZK-0036
								REZS-0036
L								REFB-1049
R					RZSR 1649			REFS-1049
R-K								REZE-1049
								REZK-1049
								REZS-1049
L								REFB-2511
R						RZSR 20511		REFS-2511
R-K								REZE-2511
								REZK-2511
								REZS-2511
L								REFB-3511
R							RZSR 25511	REFS-3511
R-K								REZE-3511
								REZK-3511
								REZS-3511

Spare parts
Axles and screws



RCSL

Type	Grub screw *	Axle	Ref. Nº HSS		Ref. Nº carbide	
RCSL 0633	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0733	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0743	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0823	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0833	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0843	M3×4	ø 3×10	RECA-0310-SZ	●	RECA-0310-HF	○
RCSL 0844	M3×4	ø 4×10	RECA-0410-SZ	●	RECA-0410-HF	○
RCSL 0855	M3×4	ø 5×12	RECA-0512-SZ	●	RECA-0512-HF	○
RCSL 1033	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSL 1043	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSL 1044	M3×4	ø 4×12	RECA-0412-SZ	●	RECA-0412-HF	○
RCSL 1055	M3×4	ø 5×12	RECA-0512-SZ	●	RECA-0512-HF	○
RCSL 1244	M3×4	ø 4×14	RECA-0414-SZ	●	RECA-0414-HF	○
RCSL 1254	M3×4	ø 4×14	RECA-0414-SZ	●	RECA-0414-HF	○
RCSL 1255	M4×4	ø 5×14	RECA-0514-SZ	●	RECA-0514-HF	○
RCSL 1265	M4×4	ø 5×14	RECA-0514-SZ	●	RECA-0514-HF	○
RCSL 1444	M4×4	ø 4×14	RECA-0414-SZ	●	RECA-0414-HF	○
RCSL 1455	M4×4	ø 5×14	RECA-0514-SZ	●	RECA-0514-HF	○
RCSL 1466	M4×4	ø 6×14	RECA-0614-SZ	●	RECA-0514-HF	○
RCSL 1654	M4×4	ø 5×16	RECA-0516-SZ	●	RECA-0516-HF	○

** The grub screws do not have an order number and must be ordered separately.*

HSS steel axle
are more resilient against impacts and cost-effective.

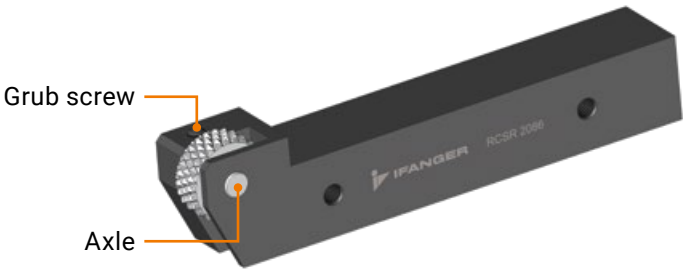
Carbide axle
offer greater hardness and wear resistance. They are particularly resistant to abrasion, making them ideal for applications involving high loads and intensive use.

Order directly online
Scan the QR code or use the web link to order the correct sparts parts online.

Example of an order-number: RECA-0310-SZ

● Default ○ Option

ifanger.com/en/shop



RCSR

Type	Grub screw *	Axle	Ref. Nº HSS		Ref. Nº carbide	
RCSR 0733	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSR 0823	M3×4	ø 3×10	RECA-0310-SZ	○	RECA-0310-HF	●
RCSR 0833	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSR 0843	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSR 0844	M3×4	ø 4×12	RECA-0412-SZ	●	RECA-0412-HF	○
RCSR 0855	M3×4	ø 5×12	RECA-0512-SZ	●	RECA-0512-HF	○
RCSR 1023	M3×4	ø 3×10	RECA-0310-SZ	○	RECA-0310-HF	●
RCSR 1033	M3×4	ø 3×12	RECA-0312-SZ	●	RECA-0312-HF	○
RCSR 1044	M3×4	ø 4×12	RECA-0412-SZ	●	RECA-0412-HF	○
RCSR 1055	M3×4	ø 5×12	RECA-0512-SZ	●	RECA-0512-HF	○
RCSR 1244	M3×4	ø 4×14	RECA-0414-SZ	●	RECA-0414-HF	○
RCSR 1254	M3×4	ø 4×14	RECA-0414-SZ	●	RECA-0414-HF	○
RCSR 1255	M4×4	ø 5×14	RECA-0514-SZ	●	RECA-0514-HF	○
RCSR 1265	M4×4	ø 5×14	RECA-0514-SZ	●	RECA-0514-HF	○
RCSR 1286	M4×5	ø 6×22	RECA-0622-SZ	●	RECA-0622-HF	○
RCSR 1644	M4×4	ø 4×16	RECA-0416-SZ	●	RECA-0416-HF	○
RCSR 1654	M4×4	ø 5×16	RECA-0516-SZ	●	RECA-0516-HF	○
RCSR 1655	M4×4	ø 5×16	RECA-0516-SZ	●	RECA-0516-HF	○
RCSR 1664	M4×4	ø 4×16	RECA-0416-SZ	●	RECA-0416-HF	○
RCSR 1686	M4×4	ø 6×22	RECA-0622-SZ	●	RECA-0622-HF	○
RCSR 2055	M4×4	ø 5×22	RECA-0522-SZ	●	RECA-0522-HF	○
RCSR 2064	M4×4	ø 4x 22	RECA-0422-SZ	●	RECA-0422-HF	○
RCSR 2066	M4×4	ø 6×22	RECA-0622-SZ	●	RECA-0622-HF	○
RCSR 2086	M4×4	ø 6×22	RECA-0622-SZ	●	RECA-0622-HF	○
RCSR 20106	M4×4	ø 6×22	RECA-0622-SZ	●	RECA-0622-HF	○
RCSR 2586	M4×6	ø 6×26		○	RECA-0626-HF	●

** The grub screws do not have an order number and must be ordered separately.*

Order directly online
Scan the QR code or use the web link to order the correct sparts parts online.

Example of an order-number: RECA-0312-SZ

● Default ○ Option

ifanger.com/en/shop

Spare parts
Axles and screws



RCDL

Type	Grub screw *	Axle	Ref. Nº HSS	Ref. Nº carbide
RCDL 0633/08	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDL 0733/08	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDL 0733/10	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDL 0743/08	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDL 0833/08	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDL 0833/10	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDL 0843/08	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDL 1033/08	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDL 1033/10	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDL 1043/08	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDL 1044/10	M3×4	ø 4×12	RECA-0412-SZ ●	RECA-0412-HF ○
RCDL 1244/10	M3×4	ø 4×12	RECA-0412-SZ ●	RECA-0412-HF ○

** The grub screws do not have an order number and must be ordered separately.*

HSS steel axle
are more resilient against impacts and cost-effective.

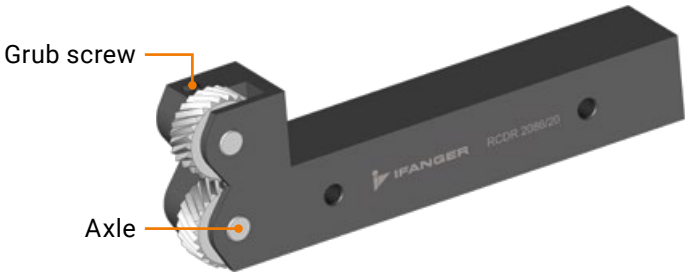
Carbide axle
offer greater hardness and wear resistance. They are particularly resistant to abrasion, making them ideal for applications involving high loads and intensive use.

Order directly online
Scan the QR code or use the web link to order the correct sparts parts online.

Example of an order-number: RECA-0310-SZ

● Default ○ Option

ifanger.com/en/shop



RCDR

Type	Grub screw *	Axle	Ref. Nº HSS	Ref. Nº carbide
RCDR 0833/08	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDR 0833/10	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDR 0843/10	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDR 1033/08	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDR 1033/10	M3×3	ø 3×10	RECA-0310-SZ ●	RECA-0310-HF ○
RCDR 1043/10	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDR 1044/10	M3×3	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDR 1244/10	M3×4	ø 3×12	RECA-0312-SZ ●	RECA-0312-HF ○
RCDR 1244/15	M3×4	ø 4×12	RECA-0412-SZ ●	RECA-0412-HF ○
RCDR 1254/15	M3×4	ø 4×12	RECA-0412-SZ ●	RECA-0412-HF ○
RCDR 1255/15	M3×3	ø 5×12	RECA-0512-SZ ●	RECA-0512-HF ○
RCDR 1644/15	M4×4	ø 4×16	RECA-0416-SZ ●	RECA-0416-HF ○
RCDR 1654/15	M4×4	ø 4×16	RECA-0416-SZ ●	RECA-0416-HF ○
RCDR 1655/15	M4×4	ø 5×16	RECA-0516-SZ ●	RECA-0516-HF ○
RCDR 1664/15	M4×4	ø 4×16	RECA-0416-SZ ●	RECA-0416-HF ○
RCDR 2044/15	M4×4	ø 4×20	RECA-0420-SZ ●	RECA-0420-HF ○
RCDR 2054/15	M4×4	ø 4×20	RECA-0420-SZ ●	RECA-0420-HF ○
RCDR 2064/15	M4×4	ø 4×20	RECA-0420-SZ ●	RECA-0420-HF ○
RCDR 2066/20	M4×4	ø 6×22	RECA-0622-SZ ●	RECA-0622-HF ○
RCDR 2086/20	M4×4	ø 6×22	RECA-0622-SZ ●	RECA-0622-HF ○
RCDR 2586/25	M4×6	ø 6×26	○	RECA-0626-HF ●

** The grub screws do not have an order number and must be ordered separately.*

HSS steel axle
are more resilient against impacts and cost-effective.

Carbide axle
offer greater hardness and wear resistance. They are particularly resistant to abrasion, making them ideal for applications involving high loads and intensive use.

Order directly online
Scan the QR code or use the web link to order the correct sparts parts online.

Example of an order-number: RECA-0310-SZ

● Default ○ Option

ifanger.com/en/shop

General information
Knurling by deformation

KNURLING BY DEFORMATION «RD»

Aligning the holder

Center height and direction of rotation of the workpiece (Fig. 1)

- Set the exact center height.
- Ensure that the holder and direction of rotation of the workpiece are compatible.

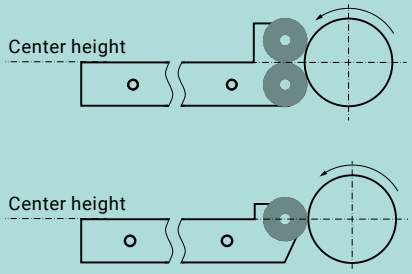
Knurling only on the X axis (Fig. 2)

Clamp the holder at a 90° angle to the workpiece.

Knurling on the X and Z axis (Fig. 3)

- Clamp the holder with a max. 2° clearance angle to the workpiece.
- The clearance angle reduces the material throw-up.

1



Knurling

For the best knurling results, turn off the surface layer (D1) (Fig. 5) of the material. This ensures precise concentricity and a low-stress material.

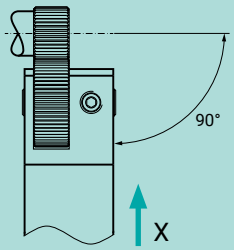
Knurling on the X axis

- Place the entire knurling roll's width over the workpiece (Fig. 2)
- Move in quickly to root diameter (D3, Fig. 5)
  D3 = D1 – pitch (T)
  Example: D1 = 20 mm, T = 1.5 mm;
  D3 = 20 mm - 1.5 mm = 18.5 mm
- Remain on the root diameter (D3) (approx. 1– 3 sec.) until the knurling profile is fully formed.

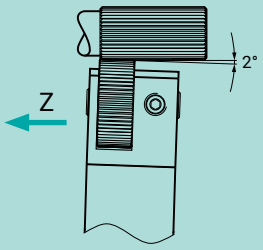
Knurling on the Z axis (Fig. 3)

- Only possible with knurling wheels that feature chamfered edges.
- Always start by plunging into the workpiece on the X axis before moving on the Z axis.
- Avoid knurling on the Z axis from outside the workpiece. (Fig. 4)

2



3



Move outwards along the X-axis
After forming the knurling profile, retract with high feed rate.

Standard values V_c, f_n

Guide values for cutting speed (V_c) and feed rate (f_n) on page 12.

Cooling emulsion

Ensure a generous supply of cooling emulsion during the machining process to optimize tool life and surface quality.

Material formability

The material should be easy to form, such as e.g. 1.4301, lead-free brass, copper, aluminum.

Number of teeth of the knurling profile on the workpiece

In order to form the knurl profile optimally, the calculated number of teeth should be at least 15 and ideally be a whole number without decimal places. Further information can be found on page 68 "Guidelines for designers".

Although the number of teeth can be calculated, it may vary slightly on the workpiece as the knurling wheel is passively driven by the workpiece. Therefore, an exact predefined number of teeth cannot be guaranteed.

Knurling diameter on the workpiece

In the knurling process, the material is reshaped and compressed, which increases the final diameter (D2). Further information can be found in the table "Material throw-up" on page 13. (Fig. 5)

Grooves and cross holes on the knurled profile

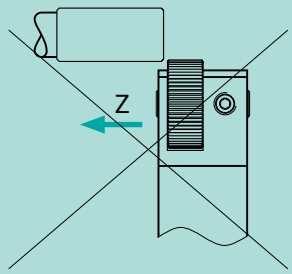
Grooves, chamfers and cross-drilled holes should always be done only after knurling.

Thin-walled workpieces and pipes

Due to the cold forming process, knurling by deformation requires high forces. Internal machining operations such as drilling and boring should therefore only be carried out afterwards.

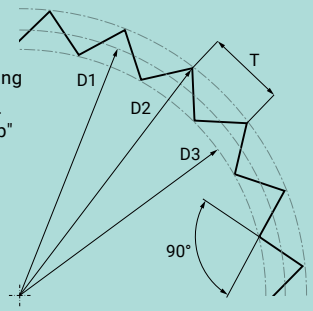
It may make sense to switch to knurling by cutting, as this process requires less force.

4



5

D1 = diameter before knurling
D2 = diamter after knurling. See "matieral throw-up" on page 13
D3 = root diameter



General information
Knurling by cutting

KNURLING BY CUTTING «RF»

Align holder

Center height and direction of rotation of the workpiece (Fig. 1)

- Set the exact center height.
- Ensure that the holder and direction of rotation of the workpiece are compatible.

Clearance angle of the knurling rolls (Fig. 2)

To achieve optimum knurling results, the knurling rolls must be positioned at a maximum clearance angle of 2°, slightly inclined to the workpiece. The front area of the knurling rolls should plunge slightly deeper into the material than the rear area. See the video animations of the corresponding holder.

Check knurling pattern (Fig. 3)

If the knurling rolls are set correctly, a symmetrical knurling pattern is created when touching the workpiece, whereby the front area of the knurl is deeper than the rear area.

Knurling

For the best knurling results, turn off the surface layer (D1, Fig. 5) of the material. This ensures precise concentricity and a low-stress material.

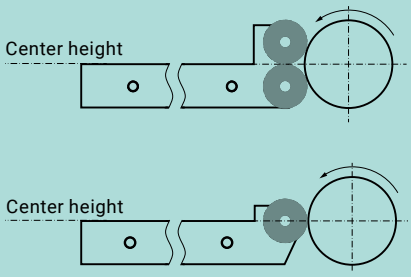
Knurling on the X axis, used to find the "gear engagement"

- Place ⅓ of the knurling rolls width over the workpiece. (Fig. 4)
- Move in quickly to foot diameter. (D2, Fig. 5)
  D2 = D1 – pitch (T)
  Example: D1 = 20 mm, T = 1.5 mm;
  D2 = 20 mm – 1.5 mm = 18.5 mm
- Dwell on the root diameter (D2) (approx. 1–3 sec.)

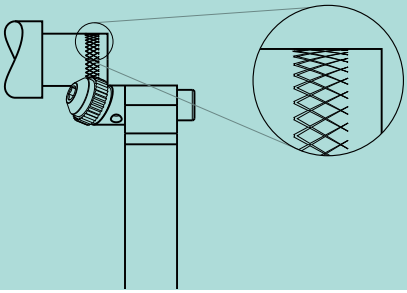
A slight increase in diameter may occur, which can be eliminated by turning a chamfer or by machining the front face. (Fig. 4)

Plunging on the X axis alone does not produce a knurl. In the knurling by cutting process, the knurl profile is created on the workpiece by machining on the Z axis. (Fig. 2)

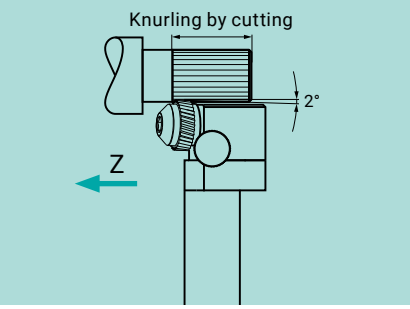
1



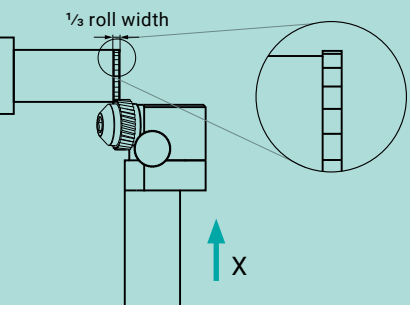
3



2



4



Knurling on the Z axis

Knurling is always carried out by first plunging into the workpiece on the X axis (Fig. 4), followed by a movement on the Z axis (Fig. 2). Knurling on the Z axis from outside the workpiece should be avoided. (Fig. 6)

Optical quality of the knurl

The highest optical quality of knurling is achieved when knurling is carried out in two steps: first a pre-knurling step, followed by a finishing step. The infeed depth for the finishing pass should only be a few hundredths of a millimeter.

Move outwards along the X-axis

After forming the knurling profile, retract with high feed rate.

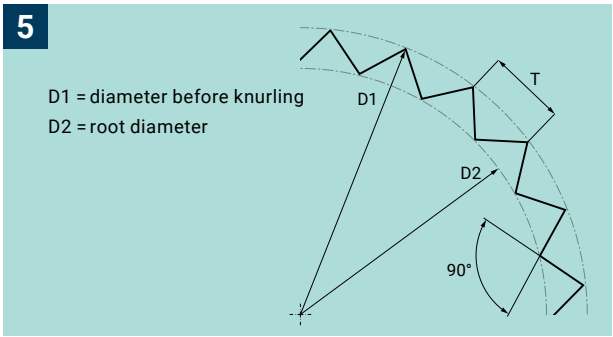
Standard values V_c, f_n

Guide values for cutting speed (V_c)) and feed rate (f_n) on page 12.

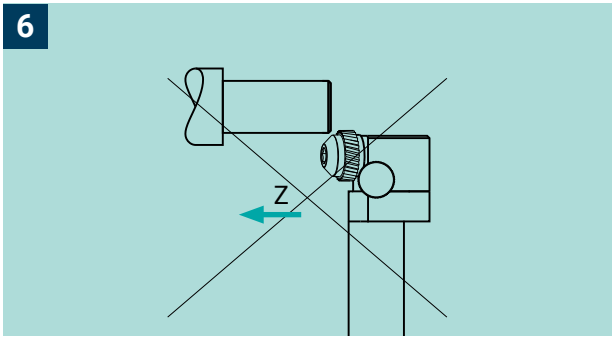
Cutting emulsion

Ensure a generous supply of cutting and cooling emulsion during the machining process to optimize tool life and surface quality.

5



6



Material

Compared to knurling by deformation, knurling by cutting is particularly suitable for harder and more brittle metals and plastics.

Number of teeth of the knurling profile on the workpiece

In order for the knurl profile to form optimally, the calculated number of teeth on the knurl should be at least 15 and ideally be a whole number without decimal places. Further information can be found on page 68 "Guidelines for designers". Although the number of teeth can be calculated, it may vary slightly on the workpiece as the knurling roll is passively driven by the workpiece. Therefore, an exact predefined number of teeth cannot be guaranteed.

Turning the chamfer

Chip removal during knurling only begins with the longitudinal movement (Z axis). For this reason, there is a small difference in diameter between the part formed by deformation (X axis) and the cutted knurl (Z axis). The area with an increase in diameter can be subsequently removed by turning a chamfer or by maschining the front face.

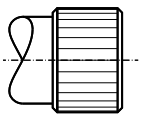
Grooves, chamfers and cross holes on the knurl profile

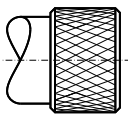
Grooves, chamfers and cross-drilled holes should always be created after knurling.

Thin-walled workpieces and pipes

If possible, internal machining such as drilling and boring should only be carried out after the knurling process.

Setup instructions



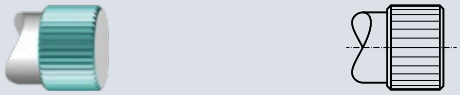
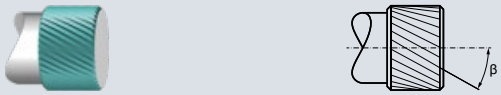
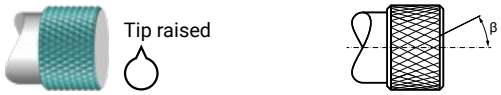
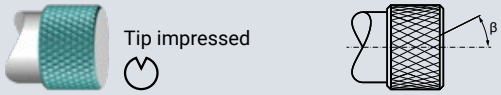
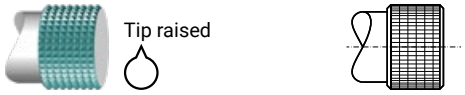
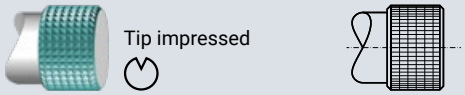


ifanger.com/RZS_Knurl

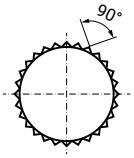
ifanger.com/RKD_Knurl

Metrical standards

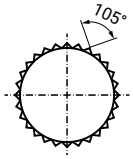
DIN 82, ISO 13444, UNI 149

Part	β	Description	Standard		
			DIN 82	ISO 13444 *VSM 34060	UNI 149
Straight knurl 	0°	RAA	RAA	Type A	A
Left-handed knurl 	30° 45°	RBL 30° RBL 45°	RBL –	– –	B
Right-handed knurl 	30° 45°	RBR 30° RBR 45°	RBR –	– –	C
Diamond knurl 30° Tip raised 	30° 45°	RGE 30° RGE 45°	RGE –	Type B –	D
Crossed knurl 45° Tip impressed 	30° 45°	RGV 30° RGV 45°	RGV –	– –	E
Crossed knurl 0° Tip raised 	0°	RKE 0°	RKE	–	
Crossed knurl 0° Tip impressed 	0°	RKV 0°	RKV	–	

** VSM has been replaced by the ISO standard.*



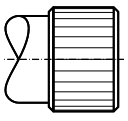
Standard profile angle (α) of the teeth



The profile angle of the teeth (α) can also differs, for ex. 105° instead of 90°. In this case, the correct designation of the knurl is e.g. DIN 82-RGE-0.8-105

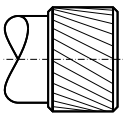
Drawing example

DIN 82 – RAA 0.4
ISO 13444 – Type A 0.4



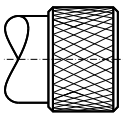
Straight knurl
Helix angle (β) 0°
Profile angle (α) 90°
Pitch T = 0.4

DIN 82 – RBR 1.0



Right-handed knurl
Helix angle (β) 30°
Profile angle (α) 90°
Pitch T = 1

DIN 82 – RGE 1.2
ISO 13444 – Type B 1.2



Diamond knurl
Tip raised
Helix angle (β) 30°
Profile angle (α) 90°
Pitch T = 1.2

Imperial standards
ANSI/ASA B94.6-1984

CP (Circular Pitch)
TPI (Teeth per Inch)

The TPI standard specifies how many knurled teeth are dispatched over a 1 inch (25.4 mm) length. Depending on the application, the tooth profile angle may vary. Standard options include 90° or 70°.

For ex: 32 TPI means 32 teeth per inch.

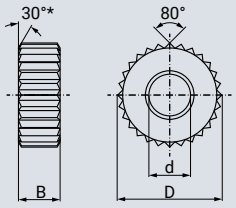
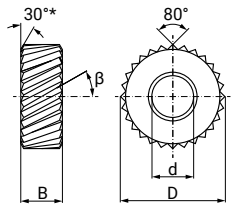
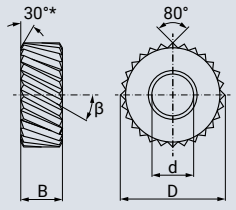
Selection of knurling rolls for the CP standard
All standard IFANGER knurling rolls can be used to produce knurled profiles according to the CP standard (with 90° profile angle). The TPI can be found on the corresponding knurling rolls pages in the catalogue.

DP (Diametrical Pitch)

This standard defines the number of knurling teeth on the circumference of a circle with a diameter of 1 inch (25.4 mm). The circumference is 79.8 mm (25.4 mm × π).
The tooth profile angle is 80°.

Example: DP 64 means that there are 64 teeth on a 79.8 mm circumference (1 inch × π).

Ifanger dimensions according to DP standard

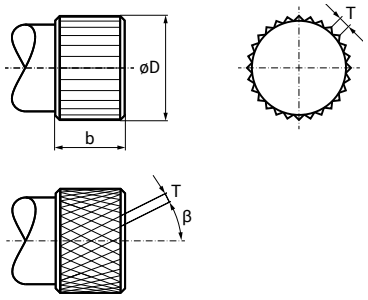
DP	Profile	D	B	d	β	Ref. N°	Coating			Approx. Pitch		
							HSS	WC/C	DVA	mm	" (Inch)	
64	RDAA	15	4	4	0	RDAA-150404-00-DP64	○	○	○	1.25	0.055	
96	RDAA	15	4	4	0	RDAA-150404-00-DP96	○	○	○	0.83	0.033	
128	RDAA	15	4	4	0	RDAA-150404-00-DP128	○	○	○	0.62	0.025	
160	RDAA	15	4	4	0	RDAA-150404-00-DP160	○	○	○	0.50	0.020	
64	RDBL	15	4	4	30	RDBL-150404-30-DP64	○	○	○	1.06	0.042	
96	RDBL	15	4	4	30	RDBL-150404-30-DP96	○	○	○	0.71	0.028	
128	RDBL	15	4	4	30	RDBL-150404-30-DP128	○	○	○	0.54	0.021	
160	RDBL	15	4	4	30	RDBL-150404-30-DP160	○	○	○	0.43	0.017	
64	RDBR	15	4	4	30	RDBR-150404-30-DP64	○	○	○	1.06	0.042	
96	RDBR	15	4	4	30	RDBR-150404-30-DP96	○	○	○	0.71	0.028	
128	RDBR	15	4	4	30	RDBR-150404-30-DP128	○	○	○	0.54	0.021	
160	RDBR	15	4	4	30	RDBR-150404-30-DP160	○	○	○	0.43	0.017	

Guidelines
for designers

The workpiece designer has the freedom to define the knurl shape and pitch according to functional requirements. However, technical feasability, the correct choice of knurling process (cutting or deformation), and overall machinability must also be taken into account.

øD		b			
		2–4	4–8	8–16	16–32
min.	max.	T			
–	3	0.4	0.4	0.5	–
3	6	0.4	0.5	0.6	0.6
6	10	0.5	0.6	0.6	0.8
10	20	0.6	0.6	0.8	1.0
20	30	0.6	0.8	0.8	1.0
30	60	0.8	0.8	1.0	1.2
60	100	0.8	1.0	1.2	1.2
100	–	–	1.0	1.6	1.6

Recommendations in accordance with ISO 13444



Ratio between knurl circumference and knurl pitch

For a successful knurling process, the ratio between the knurl circumference and the knurl pitch should be as close as possible to a whole number. If the pitch is poorly matched, the knurling roll must compensate more frequently, which negatively affects both the profile quality and the tool's service life.

Minimum required number of teeth on the workpiece

For a reliable knurling process, the number of teeth on the workpiece should be at least 15.
The number of teeth can be estimated using the following formula:

$$\text{Number of teeth} = øD \times \frac{\pi}{T} \times \cos(\beta)$$

However, since the knurling roll is passively driven by the workpiece, the actual number of teeth may cary slightly. Therefore, an exact predefined number of teeth cannot be guaranteed.

We will be happy to help you with any technical queries – simply contact us!

Notes

Notes

Notes

Notes

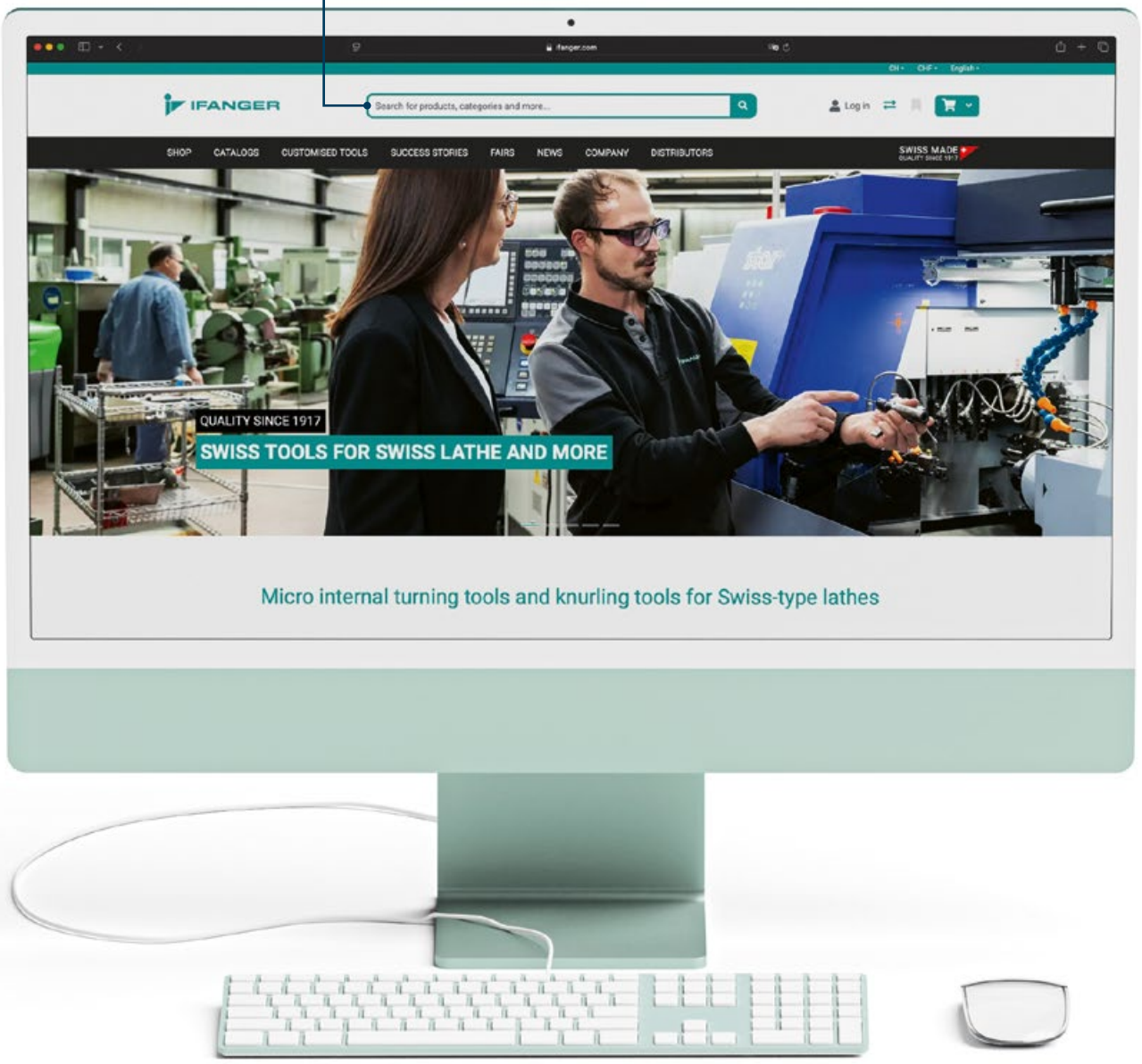
Notes

Search function

Simple, fast and convenient

You will find a large selection of specific holders and tools on our website, also for specific machines brands. Simply enter the search term in the search field.

CITIZEN DMG MORI EMCO GOODWAY HANWHA INDEX MAIER
MANURHIN NEXTURN NOMURA STAR TORNOS TRAUB TSUGAMI



Special solutions
for your challenges

Step by step to your solution

1. **Contact IFANGER**
   Contact us directly – either by telephone, via the web contact form, an email, or a sales partner.

2. **Define specifications**
   We will contact you by phone or visit you to discuss your requirements and specifications for the special tool.

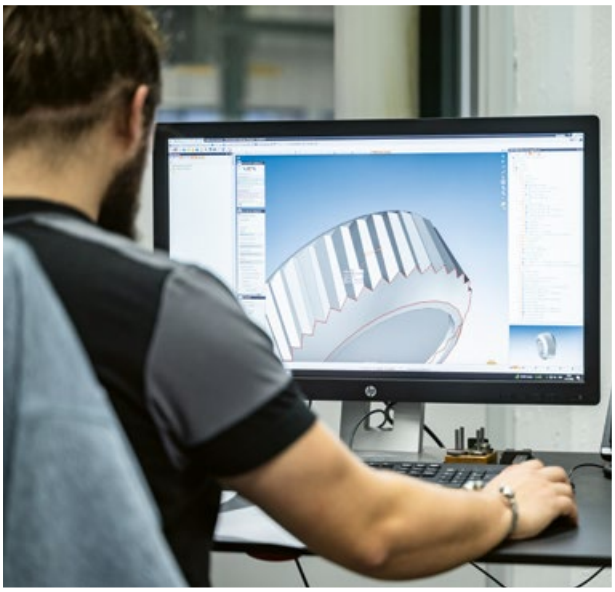
3. **Non-binding quote**
   After our evaluation, you will receive a detailed quotation covering all aspects of the development and manufacture of the special tool.

4. **Development and production**
   After your order, we manufacture your special tool.

Get in touch

ifanger.com/en/contact







IFANGER
THE CUTTING TOOL THAT KEEPS YOU AHEAD

Ifanger AG
Steigstrasse 4a
CH-8610 Uster

+41 44 943 16 16
info@ifanger.com
ifanger.com