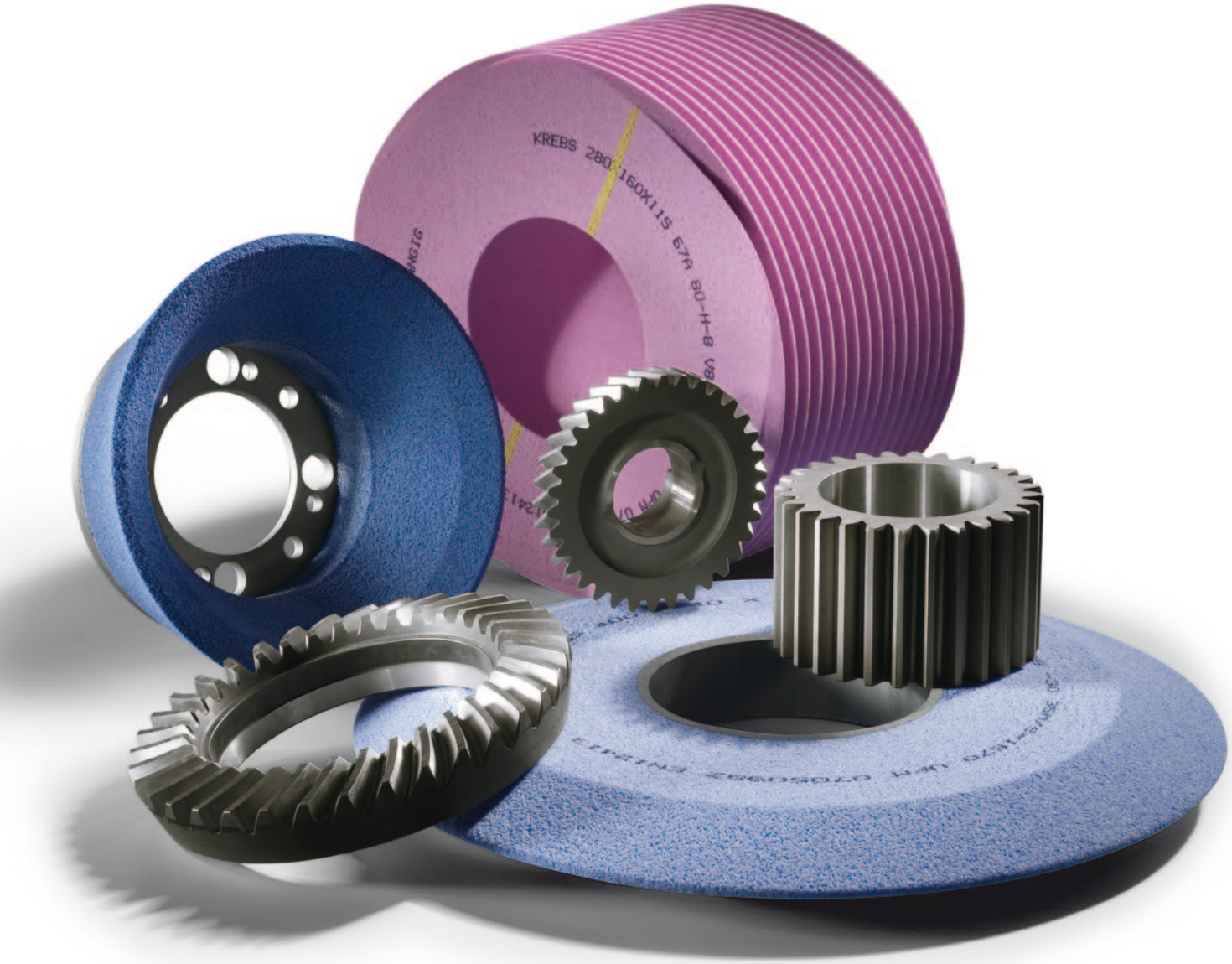
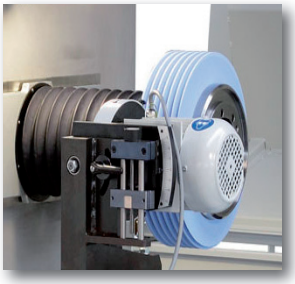
Gear grinding
with KREBS & RIEDEL

Precision – tooth for tooth.



KREBS & RIEDEL

KREBS - Grinding wheels

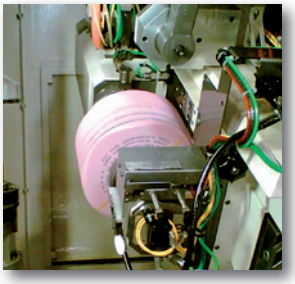


CNC-Profiling

The manufacture of these grinding wheels is undertaken at KREBS & RIEDEL on modern machines using the latest CNC profiling technology. The process and organisation of production guarantees that our customers' most demanding quality requirements are met using grinding wheels with constant structural properties and the tightest tolerances on hardness.

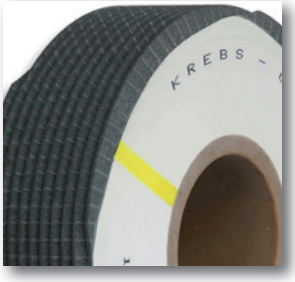
Structure of MULTO

The grinding wheel compounds are based on our innovative MULTO vitrified bond system and, in conjunction with the grinding media used (high-grade aluminium oxide, micro-crystalline sintered aluminium oxide and the new aluminium oxynitride), guarantee low thermal effects on the workpiece, good retention of profile, and cutting ability with high dressing cycle speeds and high efficiency.



Worm grinding wheel at work

We are certified in accordance with ISO 9001:2008 and produce the grinding tools in accordance with the internationally valid standards EN, ANSI and JIS. KREBS & RIEDEL is member of the GEAR RESEARCH CIRCLE of the Laboratory for Machine Tools and Production Engineering (WZL) at RWTH Aachen University (Germany).



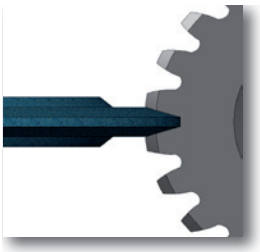
CBN-Worm grinding wheel

The range held in stock includes grinding wheels in white high-grade aluminium oxide and sintered aluminium oxide. Due to their selective porosity and grain compound, the grinding wheels guarantee a cool grind with high profile and abrasion resistance.

Most recently, the application of dressable vitrified CBN grinding wheels to gear grinding has also intensified. For this purpose, KREBS & RIEDEL can also offer you a product programme that we are continuously developing further and perfecting.

Gear Grinding

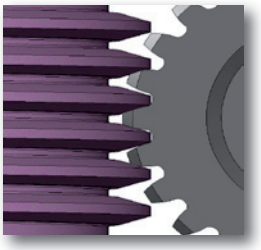
Gears are among the most important machine elements in the construction of transmissions, vehicles and machinery. The requirements placed on these products in terms of power transmission or running smoothness continue to rise steadily. Grinding is therefore one of the most important methods for fulfilling these high quality demands.



Grinding wheels for discontinuous generative grinding or profile grinding

The grinding wheel dimensions are specified by the grinding machine systems being used or by the particular task. Working speeds lie between 40 – 63 m/s, on the newest machines even as high as 70 – 80 m/s.
White high-grade aluminium oxide, special aluminium oxide mixtures or sintered aluminium oxide mixtures are preferably used as the grinding media.

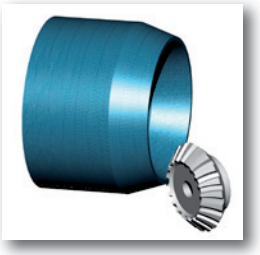
Depending on the process by which the tooth profile is generated, a differentiation is primarily made between discontinuous and continuous generative grinding or profile grinding:



Grinding wheels for continuous generative grinding or profile grinding

Discontinuous generative or profile grinding is characterised by the fact that complete tooth spaces, or in the case of older machines just the flanks of the teeth, are ground by means of shaped wheels that are chamfered on both sides. The kinematics of the machine are less complicated; the machining method is intended for medium-sized batches, medium-sized and large modules, and varying ranges.

In continuous generative or profile grinding, a worm grinding wheel and workpiece rotate synchronously with one another while the workpiece is simultaneously moved past the worm grinding wheel at several traverses. The requirements on the kinematics of the machine are demanding. The method is economical for the bulk production of small- and medium-sized modules.

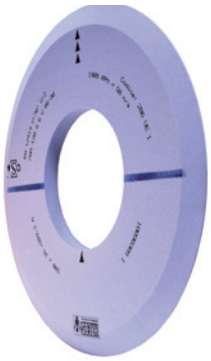


Grinding wheels for spiral grinding and bevel gear grinding

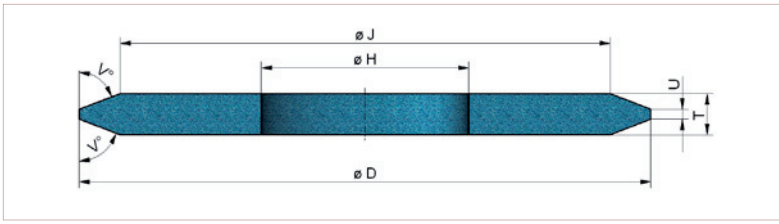
The grinding of spiral and bevel gears is a special process and is undertaken primarily with grinding rings on grinding machines by Klingelnberg and Gleason specially designed for this purpose.

Grinding wheels for discontinuous generative grinding and profile grinding

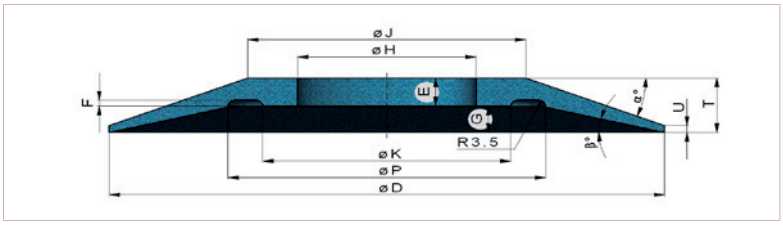
Single profile wheel (Product group 219)
MAAG grinding dish wheel (Product group 415)



KREBS & RIEDEL offer you an extensive range of dressable single profile grinding wheels in a vitrified bond for machining your internal and external gears in different materials. For this purpose, high-grade aluminium oxide, micro-crystalline sintered aluminium oxide, special aluminium oxide as well as CBN are used as grinding media. Apart from the single profile wheel for all new gear profile grinding machines, we can also produce grinding wheels for older discontinuous generative grinding machines and grinding dish wheels (product group 415) for the MAAG process.



Single profile wheel – product group 219



Grinding dish wheel – product group 415

External diameter D (mm)	80 ... 500
Width T (mm)	15 ... 100
Bore H (mm)	20 ... 203,2

The production programme features the grinding wheel dimensions listed in the table for the following machine manufacturers:

Höfler; Gleason – Pfauter; Niles; Kapp-Niles; Samputensili; Oerlikon; Reform; Maag

In stock - Product group 219

KREBS & RIEDEL also keeps tried and tested standard compounds of the single profile wheel as blanks for you in stock. When the order is placed, the grinding wheels are pre-profiled in accordance with your details. The grinding wheels can be completed within two working days. Smaller diameters and widths not found on the table can also be supplied at short notice from the goods in stock at no additional cost.

Dimensions	Specifications	Spec. no.	Use
200 x 20 x 76,2	70A 80 H 13 V 85-60 (sintered aluminium oxide)	8401 81	up to 50 m/s
350 x 40 x 127 400 x 63 x 127	35A 46 I 5 V 92 35A 46 I 5 V 92 (white high-grade aluminium oxide)	1194 65 1194 65	up to 63 m/s large modules or rough grinding tasks
350 x 40 x 127 400 x 63 x 127	70A 46 I 8 V 85-30 70A 46 I 8 V 85-30 (sintered aluminium oxide)	2471 68 2471 68	up to 63 m/s large modules or rough grinding tasks
350 x 40 x 127 400 x 63 x 127	35A 80 I 10 V 84 35A 80 I 10 V 84 (white high-grade aluminium oxide)	6457 81 6457 81	up to 63 m/s smaller - medium modules
350 x 40 x 127 400 x 63 x 127	70A 80 I 8 V 85-30 70A 80 I 8 V 85-30 (sintered aluminium oxide)	3442 68 3442 68	up to 63 m/s smaller - medium modules
350 x 40 x 127 400 x 63 x 127	70A 100 I 10 V 85-30 70A 100 I 10 V 85-30 (sintered aluminium oxide)	6461 81 6461 81	up to 63 m/s smaller - medium modules

Ordering specify:

Dimensions D x T x H	(mm)
Cutting speed vc	(m/s)
Tip width U	(mm)
Angle V	(°)

If recesses are featured, also specify the dimensions P, F and G!

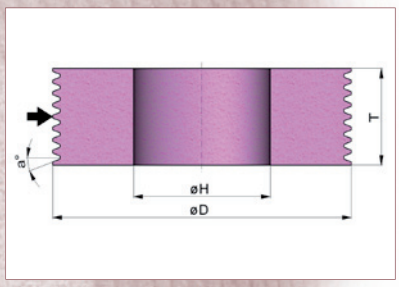
Grinding wheels for continuous generative grinding and profile grinding

Worm grinding wheels (Product group 220)

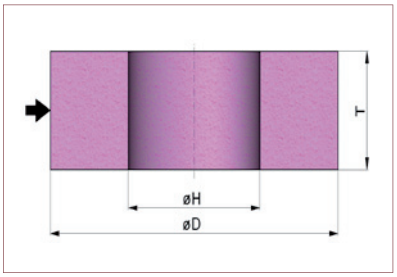
For your gear machining tasks, KREBS & RIEDEL produces a large range of dressable worm grinding wheels in a vitrified bond. Our proven specifications guarantee maximum profile retention with minimum thermal stress on your parts. A lower level of dressing abrasion is achieved through the use of selected grinding media mixtures of high-grade aluminium oxide, micro-crystalline sintered aluminium oxide, special aluminium oxide as well as CBN. We can offer optimized grinding compounds for all your maschine systems.

The following versions of worm grinding wheels are possible:

- Non-profiled
- Pre-profiled module > 0.8
- Max. of 7 gears
- Pressure angle EW according to customer's requirement



Pre-profiled

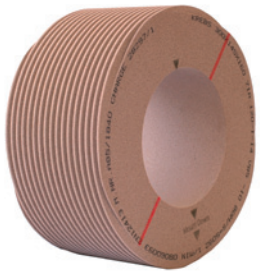


Non-profiled

External diameter D (mm)	Width T (mm)	Bore H (mm)	Machine type
350	84, 104	160	Reishauer e.g. (earlier models)
400	84, 104	160	Reishauer e.g. (earlier models)
275	125	160	Reishauer (new models)
300	125	160	Reishauer (new models)
300	145	160	Reishauer (new models)
320	125	115	Kapp-Niles
280	160	115	Kapp-Niles
240	125	120	Gleason
280	160	90	Gleason
240	230	110	Liebherr
190	200	90	Liebherr
240	104	76,2	Samputensili
220	150	76,2	Samputensili

In stock - Product group 220

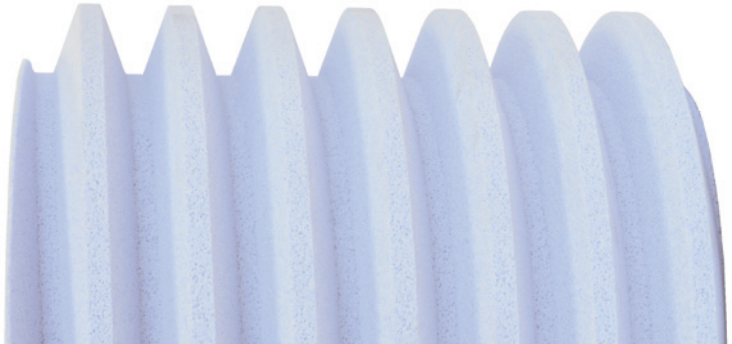
Tried and tested standard compounds are held in store as blanks; according to the customer's requirements, these can be delivered profiled or non-profiled. For module 1–4, we can deliver the ordered grinding wheels within two working days. Smaller diameters and widths not in the table (e.g. 350x84x160, 350x64x160) can also be delivered at no additional cost.



Dimensions	Specifications	Spec. no.	Use
275 x 125 x 160	71A 80 I 14 V 85 -10	6051 74	Reishauer up to 80 m/s
	71A 120 I 14 V 85 -10	6343 74	
300 x 125 x 160	71A 80 I 14 V 85 -10	6051 74	
	71A 120 I 14 V 85 -10	6343 74	
300 x 145 x 160	71A 80 I 14 V 85 -10	6051 74	
	71A 120 I 14 V 85 -10	6343 74	
280 x 160 x 115	71A 80 I 14 V 85 -10	6051 74	Kapp up to 80 m/s
	71A 120 I 14 V 85 -10	6343 74	
	70A 80 H 13 V 85 -60	8401 81	Only up to 63 m / s used
320 x 125 x 115	71A 80 I 14 V 85 -10	6051 74	
	71A 120 I 14 V 85 -10	6343 74	
	70A 80 H 13 V 85 -60	8401 81	Only up to 63 m / s used
350 x 64 x 160	71A 80 I 14 V 85 -10	6051 74	Reishauer earlier models up to 63 m/s
	71A 120 I 14 V 85 -10	6343 74	
350 x 84 x 160	71A 80 I 14 V 85 -10	6051 74	
	71A 120 I 14 V 85 -10	6343 74	
350 x 104 x 160	71A 80 I 14 V 85 -10	6051 74	
	71A 120 I 14 V 85 -10	6343 74	

Ordering specify:

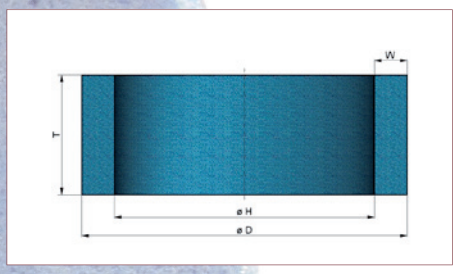
Dimensions D x T x H	(mm)
Cutting speed vc	(m/s)
Pressure angle α	(°)
Module m	(-)
Gear number	(-)



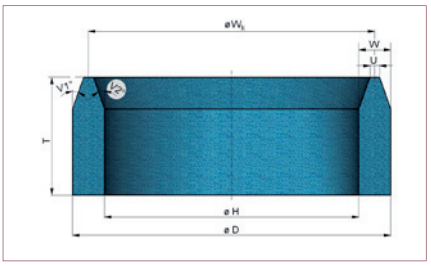
Bevel gear grinding rings (Product group 221)

For the manufacture of bevel gears and pinions for special gearboxes (car differentials, lift drives), KREBS & RIEDEL can offer various grinding rings for grinding machines of the type Klingelnberg–Oerlikon and Gleason–Phönix.

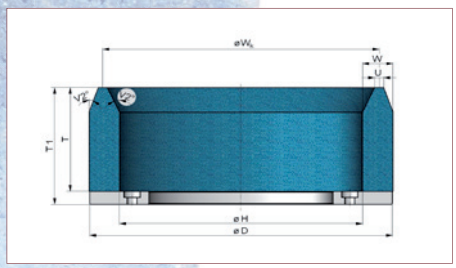
The grinding rings can be supplied with and without pre-profiling and can also be cemented to steel hubs.



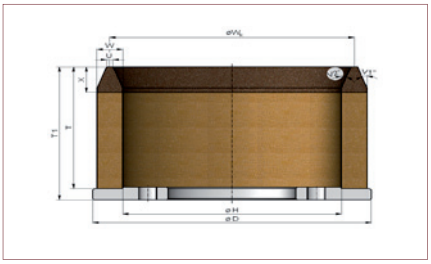
Straight, without hub



Pre-profiled, without hub



Pre-profiled, on steel hub



CBN design, pre-profiled, cemented to a steel hub

Common ranges of dimensions and machine systems:

Machines: Klingelnberg-Oerlikon und Gleason-Phönix

Dimensions 2“ - 18“ inch

Here we can also offer you field tested compounds, especially ones based on micro-crystalline sintered aluminium oxide, to fulfil your grinding tasks.

Specifications	Spec. no.	Use
70A 60 E 10 V96-30	502770	car suppliers,
70A 60 J 10 V85-30	267770	machinery construction,
70A 80 E 10 V96-30	607570	case-hardened steels
70A 80 I 8 V85-30	344268	
70A 80 H 12 V85-30	858172	
70A 80 J 12 V85-30	698672	
70A 120 H 12 V85-30	732772	
70A 46 E 10 V96-30	106570	
70A 46 D 12 V96-30 (sintered aluminium oxide)	106572	especially for rough cogging
		especially for creep feed grinding
35A 80 H 12 V84	645972	aviation industrie
35A 120 H 12 V84 (white high-grade aluminium oxide)	672572	nickel-based alloys

Ordering specify:

Dimensions D x T x H (mm)
Cutting speed vc (m/s)
Data for U, W and angles V1, V2
or as drawings in the case of special forms

Not in stock!

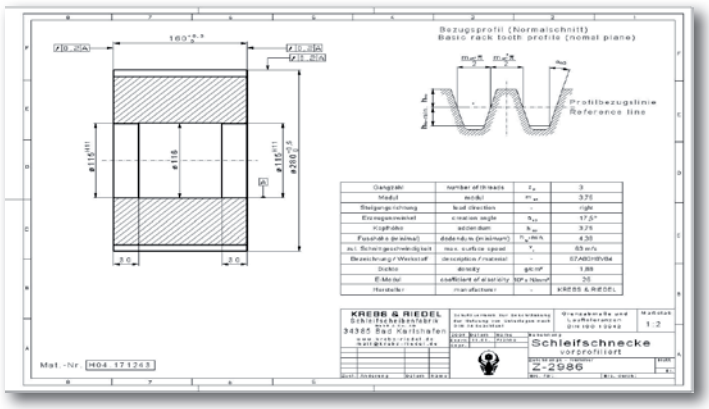
A consistent and recorded quality for our tools is the key to our customers' satisfaction.

Manufacture of our grinding wheels is carried out according to strict internal production guidelines.

- Adherence to prescribed tolerances on despatch for diameters (D), widths (T) and bores (H) D +0,5/-0 T +0,3/-0 H +0,2/-0
- Adherence to prescribed tolerances for specific material properties; elastic modules and density within half a hardness grade
- Adherence to prescribed out-of-balance tolerances
- Delivery with special plastic flanges
- Documentation concerning evidence of conformity and test certification
- Individually-boxed packaging
- Adherence of all customer-specific agreements and specifications

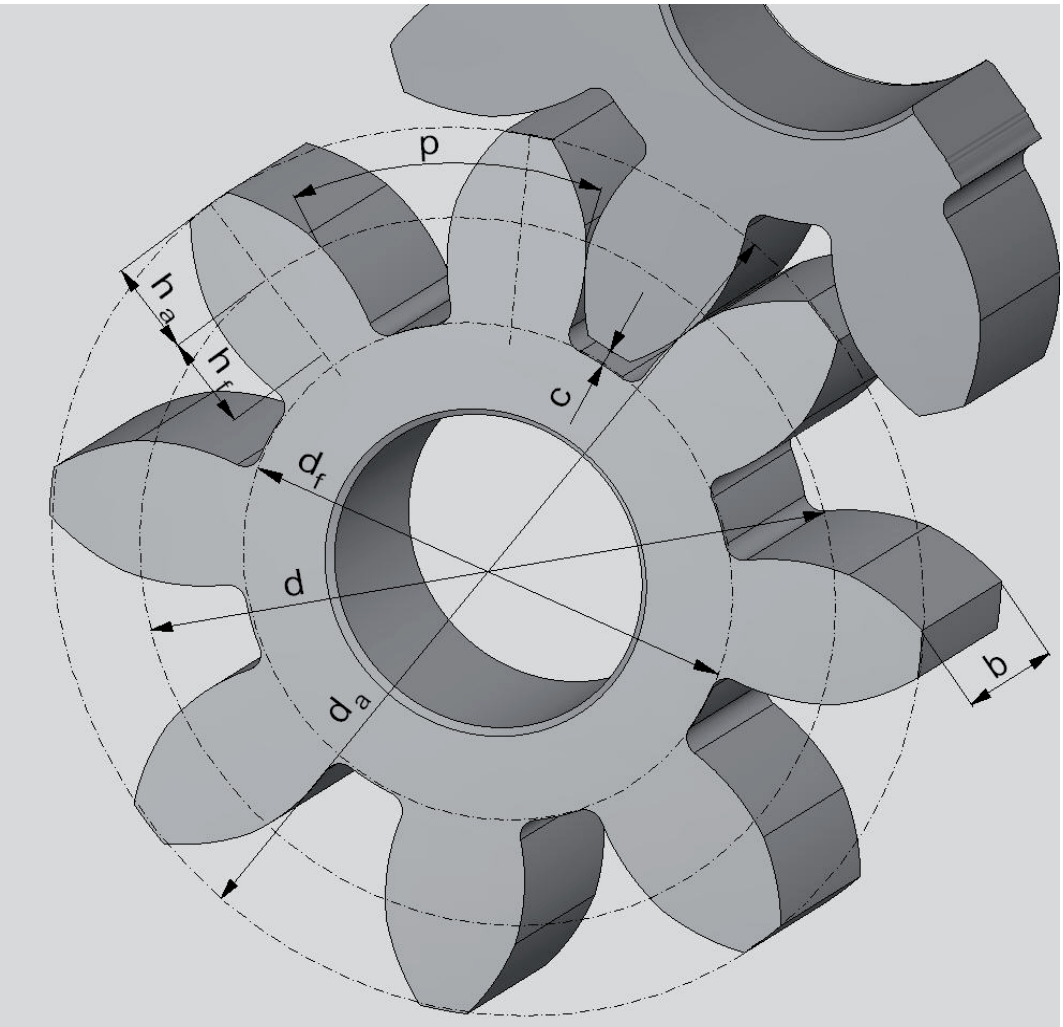
Profiling:

KREBS & RIEDEL has access to the know-how and technology that enables maximum precision pre-profiling of gear geometry. This guarantees you a fast and very short time for finish profiling when assigned to your machine.



Source: Fa. Burri

Selection of gear data and calculation formulae (straight gear):



d	= pitch circle diameter	m	= p / π = d / z
d_a	= tip circle diameter	p	= m * π
d_f	= root circle diameter	z	= d / m = da – (2m) / m
m	= module	d	= m * z = z * p / π
p	= pitch	d_a	= d + 2m = m * (z + 2)
h_a	= addendum	d_f	= d - 2m * c
h_f	= dedendum	c	≈ 0,167m
z	= number of teeth	h_f	= m + c
c	= clearance	h_a	≈ m
b	= tooth width		

Always the right tool for each situation.

We pursue our unconditional quest for quality not only in our tools for gear grinding, but throughout our entire production programme.

- Aluminium oxide and silicon carbide wheels in a ceramic and resinoid bond with an outer diameter of up to 900 mm for circular grinding, flat grinding, tool grinding, centreless grinding, rough grinding, and more.

- Cut-off grinding wheels in a resinoid bond with and without fibre reinforcement with an outer diameter of up to 600 mm for wet and dry chop cutting, for oscillating and rotational cutting, and more.

- Snagging grinding wheels with and without fibre reinforcement for foundries and contract fettling and deburring, for swing frame grinding machines, floor stand grinders, grinding manipulators, and more.

- Diamond and CBN tools with working speeds of up to 160 m/s for internal grinding, flat grinding, circular grinding, tool grinding, for special grinding methods...

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