Milling tools
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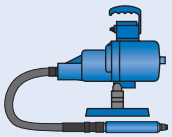
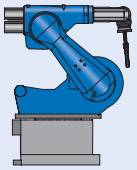
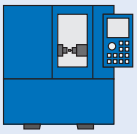
Milling







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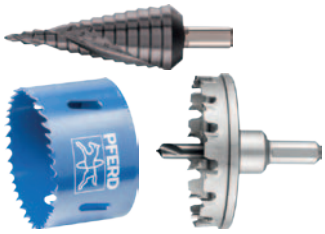
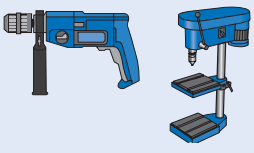
Milling tools with cutting inserts

- **ALU**MASTER High Speed Disc 102
- EDGE FINISH system for work on edges 106

Cutting out holes





HSS step drills, HSS hole saws, TC hole cutters

- HSS step drills 110
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- TC hole cutters 118

PFERD milling tools are manufactured in compliance with the highest quality standards. The broad product range offers the best tool solution for any application. Outstanding quality, a long service life and excellent stock removal rates allow economical work with diverse materials, delivering excellent results. The quality of PFERD tools has been certified according to ISO 9001.

All tools and more information:
www.pferd.com

Technical customer support

If you have any questions about the optimization of your burr applications, our sales representatives and technical advisers will be happy to help or visit you. PFERD works alongside you to provide application engineering solutions for working with diverse materials. Please do not hesitate to contact us for further information. You can find our worldwide sales offices at **www.pferd.com**.

Well packed and presented

PFERD packaging provides optimum protection for tools. All burrs and tungsten carbide hole cutters are supplied individually packed in a sturdy plastic box. HSS hole saws are supplied in a practical cardboard box. Furthermore, all packaging can be presented at the **PFERD**TOOL-CENTER. The packaging labels contain technical information, the designation and the EAN code.

PFERDTOOL-CENTER

On the **PFERD**TOOL-CENTER, the point of sale from PFERD, you will find all the important information required for selecting the most appropriate tool. A lockable display cabinet is available for burrs.

If you have questions, your or PFERD representative will be happy to assist you.

PFERDVALUE – Your added value with PFERD

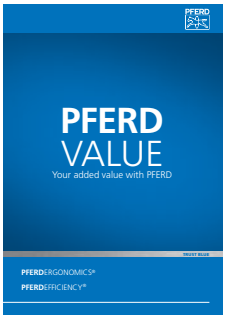
Results from the PFERD test laboratories as well as from the product tests by independent testing institutes prove: PFERD tools offer measurable added value.

Discover **PFERD**ERGONOMICS and **PFERD**EFFICIENCY:

As part of **PFERD**ERGONOMICS, PFERD offers ergonomically optimized tools and tool drives that contribute to greater safety and working comfort, and thus to health protection.

As part of **PFERD**EFFICIENCY, PFERD offers innovative, high-performance tool solutions and tool drives with outstanding added value.

For more information on this topic, please refer to our brochure "**PFERD**VALUE – Your added value with PFERD".



Application	Material group			Application	High-performance application	P.	Universal application	P.
Deburring, chamfering, milling out for the preparation of build-up welding, machining weld seams, machining contours, cleaning cast material	Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal	STEEL	33	3 PLUS	12
					ALLROUND	26		
				Fine stock removal	MICRO	74	5	
		Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	STEEL	33	3 PLUS	
					ALLROUND	26		
				Fine stock removal	MICRO	74	5	
	Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	INOX	44	4	12
					ALLROUND	26		
				Fine stock removal	MICRO	74	5	
	Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	Coarse stock removal	ALU	50	1	12
				Fine stock removal			-	
			Brass, copper, zinc	Coarse stock removal	ALU	50	1	
					NON-FERROUS	50		
				Fine stock removal	ALU	50	3	
		Hard non-ferrous metals	Bronze, titanium/ titanium alloys, hard aluminium alloys (high Si content)	Coarse stock removal	TITANIUM	62	4	
					ALU	50		
					NON-FERROUS	50		
					INOX	44		
					ALLROUND	26		
				Fine stock removal	MICRO	74	5	
		High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)	Coarse stock removal	On request	-	4	
				Fine stock removal	MICRO	74	5	
	Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/ nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal	CAST	56	3 PLUS	12
					ALLROUND	26		
				Fine stock removal	MICRO	74	3	
Milling out, machining contours	Plastics, other materials	Thermoplastics, fibre-reinforced plastics (GRP/CRP) with a fibre content ≤ 40 %		Coarse stock removal	PLAST	66	-	-
Trimming, contour milling, cutting out holes		Thermoplastics, fibre-reinforced plastics (GRP/CRP) with a fibre content > 40 %			FVK/FVKS	66		
					ALU	50		
					NON-FERROUS	50		

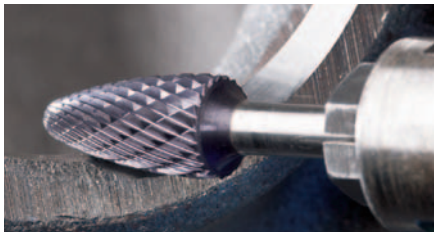
Special applications

Application	High-performance application	Page	Universal application	Page
Work on edges	TC burrs for work on edges	80	-	-
	EDGE FINISH system for work on edges	106	-	-
Problems with broken teeth	TC burrs – TOUGH, TOUGH-S cuts	68	HSS rotary cutters	88
Cutting out round holes	TC hole cutters	118	HSS step drills, HSS hole saws	110/111
Machining butt welds and fillet welds, work on edges/ chamfering using an angle grinder	**ALU**MASTER High Speed Disc	102	-	-

Burrs with a long shank

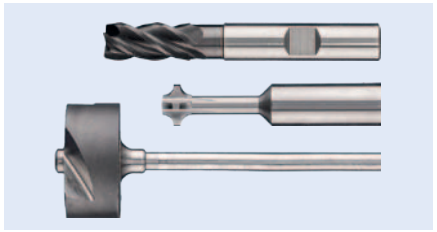
Tungsten carbide burrs with long shanks are particularly well suited to working in hard-to-reach areas. PFERD holds long-shank versions in stock for the respective product groups.

Long-shank versions are available with the 3 PLUS, STEEL, Z5 and TOUGH cuts. All long shanks can be individually shortened, and additional versions can be custom-made on request.



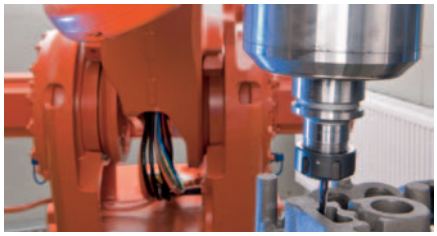
HICOAT coatings

PFERD offers tungsten carbide burrs with HICOAT coatings to tackle particularly demanding applications. The anti-wear coatings enable effective chip removal thanks to the improved anti-adhesion characteristics and increase the tools' service life. Two different coatings are available. The HICOAT coating HC-FEP is specifically designed for iron and steel materials. The HICOAT coating HC-NFE is mainly used for long-chipping and lubricating aluminium alloys and non-ferrous metals. For further details please see pages 12 and 50.



Products made to order

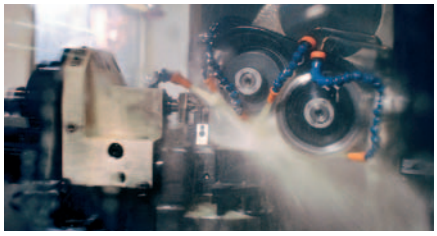
If you cannot find the solution for your particular application in our comprehensive catalogue range, we are happy to produce milling tools to meet your wishes and requirements. Our sales representatives and technical advisers will be happy to assist you in the analysis of your tasks. Your specifications and wishes, drawings relating to cuts, shank diameters, special lengths, special shapes and coatings can thus be taken into account. For more information about products made to order, please see page 100. You will also find information on solid carbide milling cutters there.



Robot applications

PFERD milling tools can be used on robots. The optimum tool for your application depends on the operating conditions.

Our sales representatives and our technical customer support team will be happy to assist you in selecting the most suitable tool.

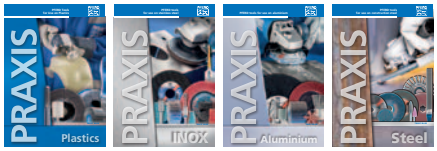


Resharpening

PFERD offers resharpening of tungsten carbide burrs, subject to a minimum resharpening quantity of 25 units (unmixed items). Regrinding of HSS rotary cutters or tungsten carbide burrs with a shank diameter of 3 mm is not recommended for economic reasons. In each individual case, our production specialists will decide whether regrinding makes sense from an economic point of view and is technically feasible. The following cuts can be resharpened (only applies to a shank diameter of 6 and 8 mm):

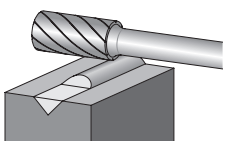
- 1 cut
- 3 cut
- 3 PLUS cut
- 4 cut
- 5 cut
- INOX
- ALU
- TITANIUM
- TOUGH
- TOUGH-S
- MICRO

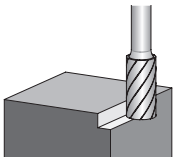
Long-shank versions and HICOAT versions can also be resharpened. Please contact us for further details.

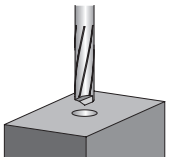


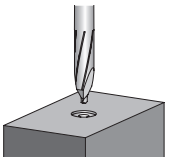
PFERDPRAXIS **brochures**

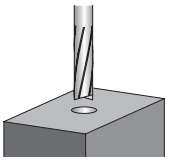
Our **PFERD**PRAXIS brochures contain a wealth of useful information on material properties as well as tips and tricks for using PFERD tools on specific materials.

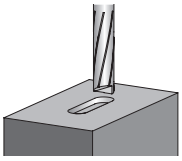
Cylindrical shape

ZYA

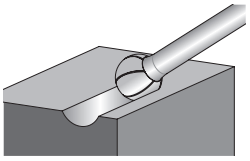
with end cut

ZYAS

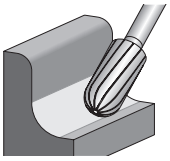
with drill cut

ZYA BS

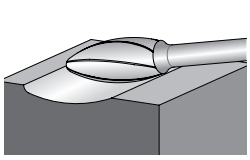
with centre drill

ZYA ZBS

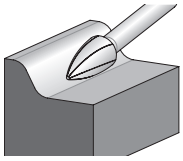
with end cut (two teeth)

ZYA STS

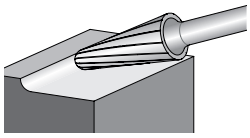
with flat end cut (two teeth)

ZYA FSTS

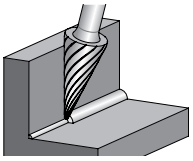
Ball shape

KUD

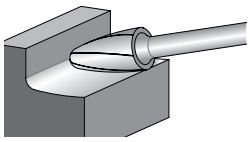
Cylindrical shape with radius end

WRC

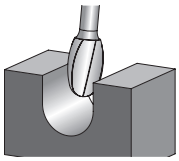
Flame shape

B

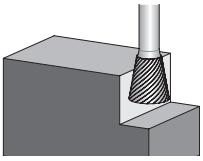
Pointed tree shape

SPG

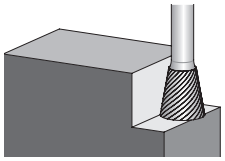
Conical shape with radius end

KEL

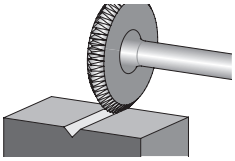
Conical pointed shape

SKM

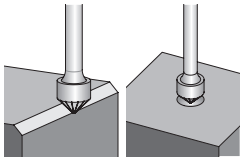
Tree shape with radius end

RBF

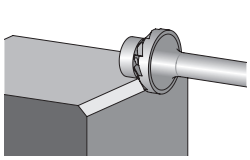
Oval shape

TRE

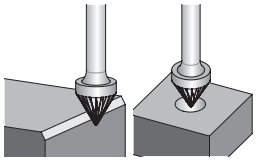
Inverted cones

WKN

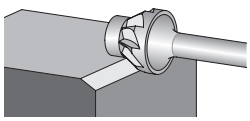
with end cut

WKNS

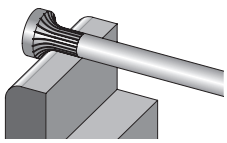
Rim shape

N

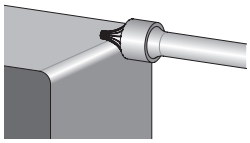
Conical counterbore shape 90°

KSK

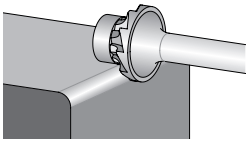
EDGE 45°

KSK EDGE

Conical counterbore shape 60°

KSJ

EDGE 30°

KSJ EDGE

Radius burrs

R

Concave radius burrs

V

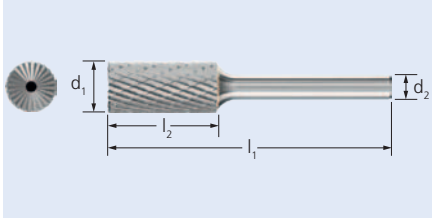
EDGE R3.0

V EDGE

Ordering instructions

Please state the EAN code or designation, cut and shank diameter when ordering.

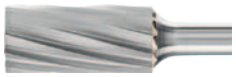
Ordering example: TC burrs
EAN 4007220**045176**
ZYAS 1225 6 Z3 PLUS
❶ ❷ ❸ ❹ ❺

Explanation of the designation
❶ Shape.
❷ Only for cylindrical shape with end cut.
❸ Burr diameter x cut length d_1 x l_2 [mm].
❹ Shank diameter d_2 [mm].
❺ Cut (add desired cut if several are available).



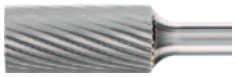
TC burrs
PFERD cuts for universal applications

1 cut
(C according to DIN 8033)



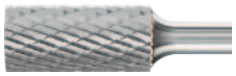
- Machining of non-ferrous metals, steel and cast iron.
- High stock removal.

3 cut
(MY according to DIN 8033)



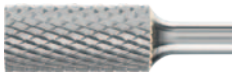
- Machining of steel, cast iron, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal.
- Good surface.

3 PLUS cut
(MX according to DIN 8033)



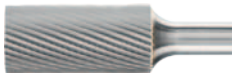
- Similar to 3 cut, but with cross cut.
- Machining of steel, cast iron, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal.

4 cut
(MX according to DIN 8033)

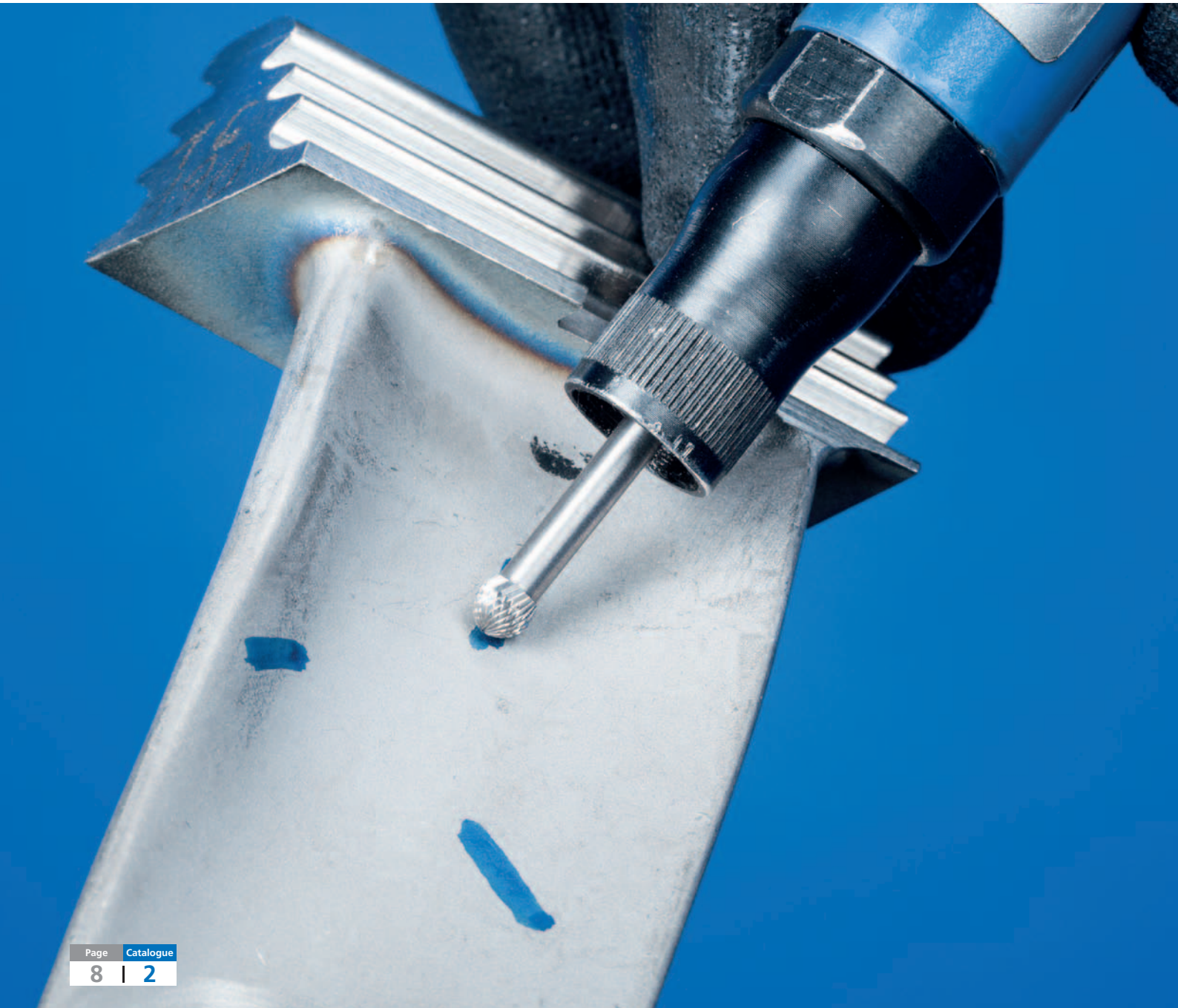


- Machining of stainless steel (INOX), steel and high-temperature-resistant materials such as nickel-based and cobalt-based alloys.
- High stock removal with short chips.
- Good surface.

5 cut
(F according to DIN 8033)



- Fine machining of steel, cast iron, stainless steel (INOX) and high-temperature-resistant materials such as nickel-based and cobalt-based alloys.
- Good surface.



ALLROUND cut

- High stock removal rate on key materials such as steel, cast steel, stainless steel (INOX), non-ferrous metals and cast iron.
- Similar to the 3 PLUS cut but with a significantly higher stock removal rate.

STEEL cut

- Extremely high stock removal rate on steel and cast steel.
- Smooth milling.
- Reduced vibration and less noise.

INOX cut

- Extremely high stock removal rate on all austenitic, rust and acid-resistant steels, stainless steel (INOX) and soft titanium alloys.
- Significantly reduced vibration and less noise.

ALU cut

- High stock removal rate on aluminium and aluminium alloys, non-ferrous metals and plastics.
- Smooth milling.

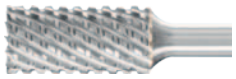
NON-FERROUS cut

- High stock removal rate on non-ferrous metals, brass, copper, plastics and fibre-reinforced plastics.
- Suitable for universal use.

CAST cut

- Extremely high stock removal rate on cast iron.
- Smooth milling.
- Reduced vibration and less noise.

TITANIUM cut



- Outstanding stock removal rate and service life on hard titanium alloys.
- Significantly increased aggressiveness, large chips and very good chip removal.
- Reduced vibration and less noise.

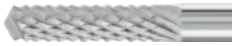
EDGE cut

- Creates exact edge shapes – with either 30° or 45° chamfering or a defined radius of 3.0 mm.
- Safe and comfortable to guide.

PLAST cut

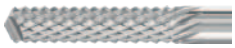
- Trimming and contour milling of workpieces made from less hard glass and carbon-fibre-reinforced duroplastics (GRP and CRP with ≤ 40 % fibre content) and fibre-reinforced thermoplastics.
- Minimized delamination and fraying through straight cut.
- Highly suitable for use on machines and on robots.
- Reduced vibration and less noise.

FVK cut



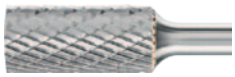
- Trimming and contour milling of workpieces made from hard glass and carbon-fibre-reinforced duroplastics (also GRP and CRP > 40 %).

FVKS cut



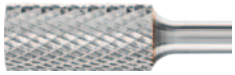
- Similar to the FVK cut.
- Smooth milling.

TOUGH cut



- High stock removal rate on cast iron, steel < 54 HRC.
- Extremely resistant to impacts.
- Also suitable for use with high surface contact angles > 1/3 and under impact loads.

TOUGH-S cut



- High stock removal rate on cast iron, steel < 54 HRC.
- Similar to the TOUGH cut, but with smoother milling and shorter chips.
- Extremely resistant to impacts.
- Also suitable for use with high surface contact angles > 1/3 and under impact loads.

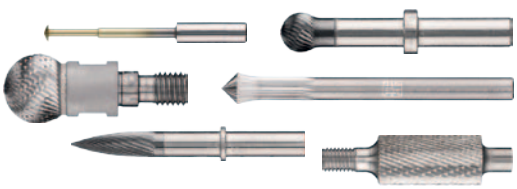
MICRO cut

- Good stock removal on almost all materials < 68 HRC.
- High surface quality.
- Reduced vibration and less noise.

HICOAT coatings

- In general, all PFERD tungsten carbide burrs are also available with HICOAT coatings.
- Improved anti-adhesion characteristics.
- Effective chip discharge.
- Lower thermal loads.
- Increased service life.
- Also suitable for use at higher cutting speeds when compared with uncoated burrs.

Products made to order

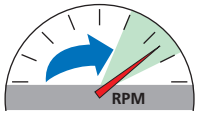


If you cannot find the solution for your particular application in our extensive catalogue range, we produce PFERD premium-quality burrs, tailor-made to meet the requirements of your job.
Further information on PFERD products made to order can be found on page 100.

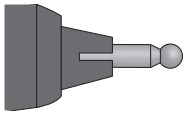
TC burrs
Recommendations for use and instances of misuse

Recommendations for use:

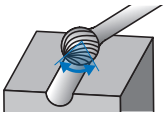
An optimum rotational speed and power output for the tool drive (airpowered or electric grinders, flexible shaft drive) are required for cost-effective use of tungsten carbide burrs.



- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For cost-effective use of burrs with a shank diameter > 6 mm, a tool drive output of 300–500 watts is required when used at a higher rotational speed and cutting speed.
- Use the highest rotational speed possible within the recommended rotational speed and cutting speed ranges.
- For applications with low stock removal (deburring, chamfering, minor work on surfaces), the rotational speed can be increased by up to 100 % (this excludes tungsten carbide burrs with long shanks).

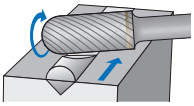


- Use only rigid clamping systems and drives as impacts on the tools and tool chatter lead to premature wear.



1/3 of the total surface

- The burr surface in contact with the workpiece must not exceed 1/3 of the total burr surface. Failure to comply with this recommendation will result in rough milling behaviour and possibly in broken teeth. If this cannot be avoided, we recommend using the TOUGH and TOUGH-S cuts.



In direction of rotation = fine finish

- In general, burrs are used counterrotationally or with a swinging motion. To achieve fine finishes, pass the tool rapidly over the workpiece in the direction of rotation.

Safety notes:

= Wear eye protection!

= Wear hearing protection!

= Observe the recommended rotational speed, especially when using burrs with long shanks!

= Wearing protective gloves is recommended. Handle the tool drive with both hands.

Avoiding misuse

Figure	Consequences of misuse	Solution
	The burr becomes clogged during use.	Use the correct cut for the material being machined. Use tools with a HICOAT coating or use grinding oil.
	Pronounced discolouration can be seen in the transition between the toothed section and the shank.*	Observe the recommended rotational speeds and/or reduce the contact pressure and surface contact angle.
	The toothed section detaches from the shank.	
	There are flying sparks.	Reduce the rotational speed and contact pressure and make sure that the surface contact angle is no more than 1/3 of the burr surface.
	Parts break off from the toothed section.	Avoid impact loads when using the tool.

Figure	Consequences of misuse	Solution
	The shank breaks.	Only use rigid drives and undamaged clamping systems, and replace them if necessary.
incorrect correct	The clamping length is incorrect.	Do not chose a burr clamping depth that is too small. **In general,** the minimum clamping depth is 2/3 of the shank length (does not apply to burrs with long shanks).
	The shank bends on burrs with a long shank.	Observe the recommended rotational speeds and safety notes for burrs with a long shank.
	Signs of wear such as rough running and strong vibrations occur, as well as increased flying sparks.	Do not use burrs beyond the end of their service life. Use a new burr instead.

* On TC burrs designed for high-performance applications, blue discolouration is extremely difficult to avoid on account of the very high stock removal rate. However, this does not constitute a safety risk.

Tungsten carbide burrs with a long shank are ideal for cost-effectively machining small, hard-to-reach areas on components. Long-shank versions are available with the 3 PLUS, 5, STEEL and TOUGH cuts.

Tungsten carbide burrs with a long shank can be shortened if required.
Tungsten carbide burrs with the designation **GL 75 mm** are made from solid tungsten carbide, which means they can only be shortened using diamond tools.
GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)

Safety notes:

Not suitable for robotic or stationary applications. **Risk of bending**. Use only rigid clamping systems/drives.

= Observe the prescribed rotational speed!

Safety note – maximum rotational speed [RPM] for burrs with long shanks

When working with long-shank burrs, it is crucial that the burr is in contact with the workpiece (or inserted in the bore or slot to be machined) before the drive system is turned on. As a rule, the tool must remain in contact with the workpiece for as long as the machine is running. Failure to observe this procedure may result in shank failure (bending) and hence an increased risk of accidents. If continuous contact between the tool and the workpiece is not guaranteed, the ❸ **maximum idling speeds stated in the table must not be exceeded**.

For safety reasons, the maximum application speeds ❷ **with contact with the workpiece** require a reduction in the recommended speed of tungsten carbide burrs with standard shanks. The reduced speeds are stated in the table below.

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Select the required burr diameter.
❷ For the maximum application speed [RPM] with contact with the workpiece, please refer to the right-hand side of the table.

Example:
TC burr, SL 150 mm,
3 PLUS cut,
burr dia. 12 mm.
Coarse stock removal on steels
up to 1,200 N/mm².
Maximum application speed with contact with the workpiece: 7,000 RPM

❶ Burr dia. [mm]	❸ Maximum idling speed [RPM] without contact with the workpiece		❷ Maximum application speed [RPM] with contact with the workpiece	
	Shank length [mm]			
	75	150	75	150
3	10,000	-	31,000	-
6	6,000	-	15,000	-
8	-	6,000	-	11,000
10	-	4,000	-	9,000
12	-	3,000	-	7,000

Extensions for drive spindles

In some applications, drive spindle extensions are an economic alternative to customized burrs with long shanks. For more information please see page 25.

TC burrs for universal applications

For fine and coarse stock removal

TC burrs for universal applications are suitable for fine and coarse stock removal on the key materials used in industrial manufacturing. They provide a good stock removal rate and are not specific to a particular material.

Advantages:

- Good stock removal rate through optimum matching of tungsten carbide, geometry, cut and available coating.
- Long tool life.
- Reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- High surface quality.

Materials that can be worked:

- Steel, cast steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron

Applications:

- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

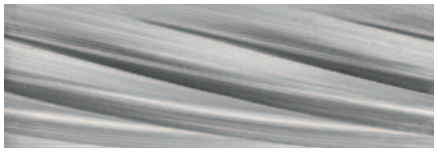
Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds.
  Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

Matching tool drives:

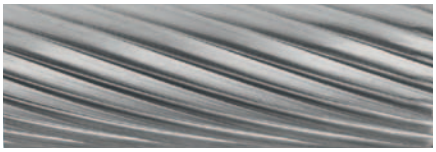
- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

1 cut
(C according to DIN 8033)



- Machining of non-ferrous metals, steel and cast iron.
- High stock removal.

3 cut
(MY according to DIN 8033)

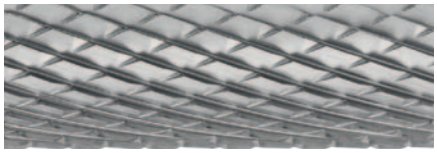


- Machining of cast iron, steel, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal.
- Good surface.

3 PLUS cut
(MX according to DIN 8033)

- Similar to 3 cut, but with cross cut.
- Machining of cast iron, steel, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal.

4 cut
(MX according to DIN 8033)



- Machining of stainless steel (INOX), steel and high-temperature-resistant materials such as nickel-based and cobalt-based alloys.
- High stock removal with short chips.
- Good surface.

5 cut
(F according to DIN 8033)

- Fine machining of cast iron, steel, stainless steel (INOX) and high-temperature-resistant materials such as nickel-based and cobalt-based alloys.
- Good surface.

HICOAT coating HC-FEP for iron and steel materials

- High hardness and wear resistance.
- Effective chip removal through improved anti-adhesion characteristics.
- Very high resistance against thermal load.
- Increased service life.
- Also suitable for use at higher cutting speeds when compared with uncoated burrs.

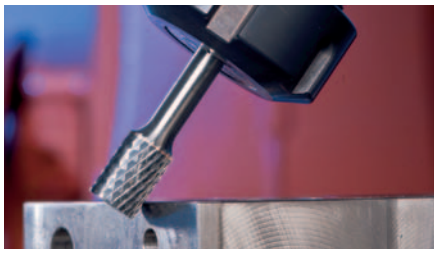
Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Determine the type of application.
❸ Select the cut.
❹ Establish the cutting speed range.

To determine the recommended rotational speed range [RPM], please proceed as follows:

❺ Select the required burr diameter.
❻ The cutting speed range and the burr diameter determine the recommended rotational speed range.



❶ Material group			❷ Application	❸ Cut	❹ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal	1	600–900 m/min
				3 PLUS	450–600 m/min
				HICOAT HC-FEP	450–750 m/min
			Fine stock removal	5	450–600 m/min
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	3	250–350 m/min
				3 PLUS	
				4	
				HICOAT HC-FEP	250–450 m/min
			Fine stock removal	5	350–450 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	1	250–450 m/min
				3	250–350 m/min
				3 PLUS	
				4	250–450 m/min
			Fine stock removal	5	350–450 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	Coarse stock removal	1	600–900 m/min
		Brass, copper, zinc	Coarse stock removal	1	600–900 m/min
			Fine stock removal	3	450–600 m/min
	Hard non-ferrous metals	Bronze, titanium/titanium alloys, hard aluminium alloys (high Si content)	Coarse stock removal	3	250–350 m/min
				4	
			Fine stock removal	5	350–450 m/min
	High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)	Coarse stock removal	3 PLUS	250–450 m/min
				4	
			Fine stock removal	5	350–600 m/min
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal	1	600–900 m/min
				3 PLUS	450–600 m/min
			Fine stock removal	3	450–600 m/min

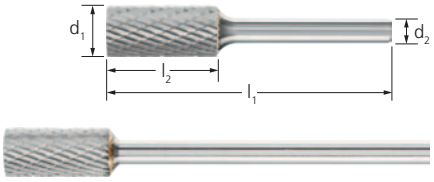
Example:
TC burr,
3 PLUS cut,
burr dia. 12 mm.
Coarse stock removal on steels up to 1,200 N/mm².
Cutting speed: 450–600 m/min
Rotational speed range: 12,000–16,000 RPM

❺ Burr dia. [mm]	❻ Cutting speeds [m/min]					
	250	350	450	600	750	900
	Rotational speeds [RPM]					
1.5	53,000	74,000	95,000	127,000	159,000	191,000
2	40,000	56,000	72,000	95,000	119,000	143,000
3	27,000	37,000	48,000	64,000	80,000	95,000
4	20,000	28,000	36,000	48,000	60,000	72,000
6	13,000	19,000	24,000	32,000	40,000	48,000
8	10,000	14,000	18,000	24,000	30,000	36,000
10	8,000	11,000	14,000	19,000	24,000	29,000
12	7,000	9,000	12,000	16,000	20,000	24,000
16	5,000	7,000	9,000	12,000	15,000	18,000
20	4,000	6,000	7,000	10,000	12,000	14,000
25	3,000	4,000	6,000	8,000	10,000	11,000

Safety note:

Please observe the reduced rotational speeds for long-shank versions. They can be found on page 11.

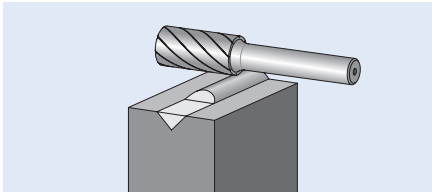
TC burrs for universal applications
For fine and coarse stock removal



Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032 with cut conforming to DIN 8033.

GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)



Ordering notes:
- Please complete the description with the desired cut.

Safety notes:

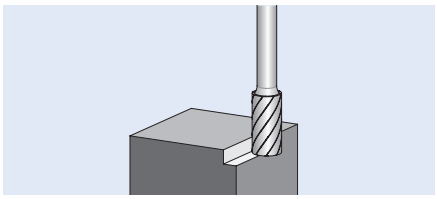
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

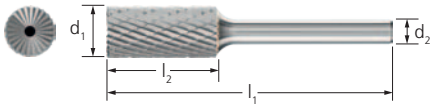
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 3 PLUS HC-FEP	Cut 4	Cut 5		Description
				EAN 4007220							
Shank dia. 3 mm											
2	10	3	40	-	-	233771	-	233788	233795	1	ZYA 0210/3 Z ...
3	13	3	43	-	-	233801	-	402627	233818	1	ZYA 0313/3 Z ...
6	7	3	37	-	-	233825	-	-	233832	1	ZYA 0607/3 Z ...
	13	3	43	-	-	233849	-	-	233856	1	ZYA 0613/3 Z ...
Long shank dia. of 3 mm, SL/GL 75 mm											
3	13	3	75	-	-	779699	-	-	779644	1	ZYA 0313/3 Z ... GL 75
6	13	3	88	-	-	779606	-	-	779583	1	ZYA 0613/3 Z ... SL 75
Shank dia. 6 mm											
4	13	6	55	-	-	045435	-	045459	045466	1	ZYA 0413/6 Z ...
6	16	6	55	-	045473	045480	835548	045503	045510	1	ZYA 0616/6 Z ...
8	20	6	60	-	045534	045541	-	045565	045572	1	ZYA 0820/6 Z ...
10	13	6	53	-	-	045596	-	045626	045640	1	ZYA 1013/6 Z ...
	20	6	60	045862	045855	045879	-	045916	045930	1	ZYA 1020/6 Z ...
	25	6	65	-	-	045978	-	046012	-	1	ZYA 1025/6 Z ...
12	25	6	65	045671	045657	045695	835555	045732	045756	1	ZYA 1225/6 Z ...
16	25	6	65	-	045787	045800	-	045848	-	1	ZYA 1625/6 Z ...
Long shank dia. of 6 mm, SL 150 mm											
6	16	6	172	-	-	090114	-	-	-	1	ZYA 0616/6 Z ... SL 150
8	20	6	170	-	-	617632	-	-	-	1	ZYA 0820/6 Z ... SL 150
10	20	6	170	-	-	090121	-	-	-	1	ZYA 1020/6 Z ... SL 150
12	25	6	175	-	-	617649	-	-	-	1	ZYA 1225/6 Z ... SL 150
Shank dia. 8 mm											
12	25	8	65	-	-	045701	-	-	-	1	ZYA 1225/8 Z ...
16	25	8	65	-	-	045817	-	-	-	1	ZYA 1625/8 Z ...

Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut according to DIN 8033.

GL = total length (solid tungsten carbide)





Ordering notes:

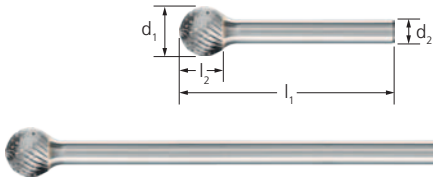
- Please complete the description with the desired cut.

Safety notes:

Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 3	Cut 3 PLUS	Cut 4	Cut 5		Description
				EAN 4007220					
Shank dia. 3 mm									
2	10	3	40	-	049471	049457	049464	1	ZYAS 0210/3 Z ...
3	13	3	43	-	049501	072394	049488	1	ZYAS 0313/3 Z ...
6	7	3	37	-	049532	-	049518	1	ZYAS 0607/3 Z ...
	13	3	43	-	049563	402634	049549	1	ZYAS 0613/3 Z ...
Long shank dia. of 3 mm, GL 75 mm									
3	13	3	75	-	779705	-	779712	1	ZYAS 0313/3 Z ... GL 75
Shank dia. 6 mm									
4	13	6	55	-	044926	044940	044957	1	ZYAS 0413/6 Z ...
6	16	6	55	044964	044971	044995	045008	1	ZYAS 0616/6 Z ...
8	20	6	60	045015	045022	045046	045053	1	ZYAS 0820/6 Z ...
10	13	6	53	-	045084	-	-	1	ZYAS 1013/6 Z ...
	20	6	60	045299	045305	045336	045350	1	ZYAS 1020/6 Z ...
	25	6	65	-	045374	045404	-	1	ZYAS 1025/6 Z ...
12	25	6	65	045145	045176	045213	045237	1	ZYAS 1225/6 Z ...
16	25	6	65	045244	045251	045275	045282	1	ZYAS 1625/6 Z ...
Shank dia. 8 mm									
12	25	8	65	-	045183	-	-	1	ZYAS 1225/8 Z ...

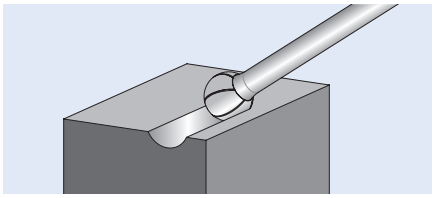
TC burrs for universal applications
For fine and coarse stock removal



Ball shape KUD

Ball-shaped burr according to DIN 8032 with cut conforming to DIN 8033.

GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)



Ordering notes:
- Please complete the description with the desired cut.

Safety notes:

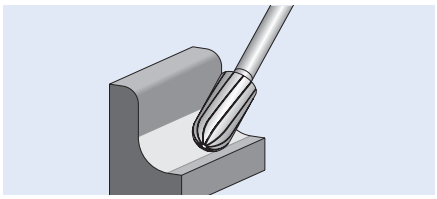
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

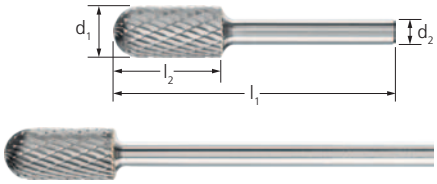
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 3 PLUS HC-FEP	Cut 4	Cut 5		Description
				EAN 4007220							
Shank dia. 3 mm											
1.5	1	3	33	-	-	955444	-	-	955451	1	KUD 01,51/3 Z ...
2	1.5	3	33	-	-	955468	-	-	955475	1	KUD 021,5/3 Z ...
3	2	3	33	-	-	049778	-	392058	049761	1	KUD 0302/3 Z ...
4	3	3	34	-	-	049792	-	394915	049785	1	KUD 0403/3 Z ...
6	5	3	35	-	-	049815	-	393192	049808	1	KUD 0605/3 Z ...
Long shank dia. of 3 mm, SL/GL 75 mm											
3	2	3	75	-	-	780060	-	-	780053	1	KUD 0302/3 Z ... GL 75
6	5	3	80	-	-	780039	-	-	780022	1	KUD 0605/3 Z ... SL 75
Shank dia. 6 mm											
4	3	6	45	-	-	046791	-	-	046807	1	KUD 0403/6 Z ...
6	5	6	45	046814	046838	046821	835586	046845	046852	1	KUD 0605/6 Z ...
8	7	6	47	046876	046890	046883	-	046906	046913	1	KUD 0807/6 Z ...
10	9	6	49	046944	046937	046951	835593	046975	046982	1	KUD 1009/6 Z ...
12	10	6	51	-	047002	047033	835609	047071	047088	1	KUD 1210/6 Z ...
16	14	6	54	047125	-	047132	-	047170	047187	1	KUD 1614/6 Z ...
20	18	6	58	-	047194	047224	-	-	-	1	KUD 2018/6 Z ...
Long shank dia. of 6 mm, SL 150 mm											
6	5	6	155	-	-	090237	-	-	-	1	KUD 0605/6 Z ... SL 150
8	7	6	157	-	-	617687	-	-	-	1	KUD 0807/6 Z ... SL 150
10	9	6	159	-	-	090244	-	-	-	1	KUD 1009/6 Z ... SL 150
12	10	6	160	-	-	617694	-	-	-	1	KUD 1210/6 Z ... SL 150
Shank dia. 8 mm											
12	10	8	51	-	-	047040	-	-	-	1	KUD 1210/8 Z ...
16	14	8	54	-	-	047149	-	-	-	1	KUD 1614/8 Z ...
20	18	8	58	-	-	047231	-	-	-	1	KUD 2018/8 Z ...

Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 with cut conforming to DIN 8033.
Combination of cylindrical and ball-shaped geometries.

GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)



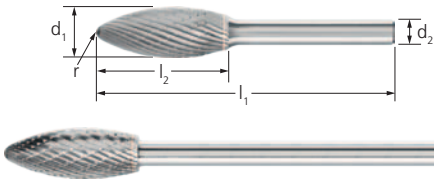


Ordering notes:
- Please complete the description with the desired cut.

Safety notes:
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 3 PLUS HC-FEP	Cut 4	Cut 5		Description
				EAN 4007220							
Shank dia. 3 mm											
2	10	3	40	-	-	049631	-	395837	049624	1	WRC 0210/3 Z ...
3	13	3	43	-	-	049662	-	393161	049648	1	WRC 0313/3 Z ...
6	13	3	43	-	-	049693	-	393178	049679	1	WRC 0613/3 Z ...
Long shank dia. of 3 mm, SL/GL 75 mm											
3	13	3	75	-	-	779767	-	-	779750	1	WRC 0313/3 Z ... GL 75
6	13	3	88	-	-	779743	-	-	779729	1	WRC 0613/3 Z ... SL 75
Shank dia. 6 mm											
4	13	6	55	-	-	046173	-	046197	-	1	WRC 0413/6 Z ...
6	16	6	55	046227	046210	046234	835562	046258	046265	1	WRC 0616/6 Z ...
8	20	6	60	046296	046289	046302	-	046326	046333	1	WRC 0820/6 Z ...
10	20	6	60	046371	046357	046388	-	046425	046449	1	WRC 1020/6 Z ...
	25	6	65	-	046708	046715	-	046746	-	1	WRC 1025/6 Z ...
12	25	6	65	046487	046463	046500	835579	046548	046562	1	WRC 1225/6 Z ...
16	25	6	65	046623	046609	046630	-	046678	-	1	WRC 1625/6 Z ...
Long shank dia. of 6 mm, SL 150 mm											
6	16	6	172	-	-	090336	-	-	-	1	WRC 0616/6 Z ... SL 150
8	20	6	170	-	-	617656	-	-	-	1	WRC 0820/6 Z ... SL 150
10	20	6	170	-	-	090343	-	-	-	1	WRC 1020/6 Z ... SL 150
12	25	6	175	-	-	617663	-	-	-	1	WRC 1225/6 Z ... SL 150
Shank dia. 8 mm											
10	20	8	60	-	-	046395	-	-	-	1	WRC 1020/8 Z ...
12	25	8	65	-	-	046517	-	046555	-	1	WRC 1225/8 Z ...
16	25	8	65	-	-	046647	-	-	-	1	WRC 1625/8 Z ...

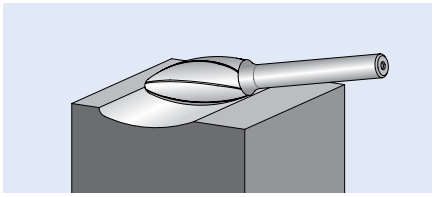
TC burrs for universal applications
For fine and coarse stock removal



Flame shape B

Flame-shaped burr according to ISO 7755/8 with cut conforming to DIN 8033.

SL = shank length (long steel shank)



Ordering notes:

- Please complete the description with the desired cut.

Safety notes:

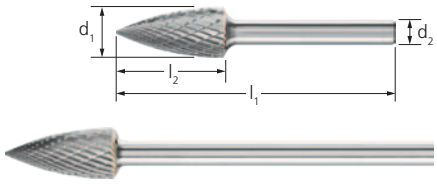
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

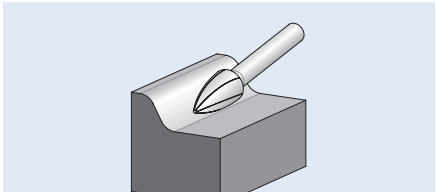
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut 3	Cut 3 PLUS	Cut 5		Description
					EAN 4007220				
Shank dia. 3 mm									
3	7	3	37	0.8	-	955482	049570	1	B 0307/3 Z ...
6	13	3	43	1.0	-	955499	049594	1	B 0613/3 Z ...
Shank dia. 6 mm									
8	20	6	60	1.5	046050	046067	-	1	B 0820/6 Z ...
10	25	6	65	1.7	-	955505	-	1	B 1025/6 Z ...
12	30	6	70	2.1	046098	046111	-	1	B 1230/6 Z ...
16	35	6	75	2.6	-	046142	-	1	B 1635/6 Z ...
Long shank dia. of 6 mm, SL 150 mm									
8	20	6	170	1.5	-	617755	-	1	B 0820/6 Z ... SL 150
10	25	6	175	1.7	-	090480	-	1	B 1025/6 Z ... SL 150
12	30	6	180	2.1	-	617779	-	1	B 1230/6 Z ... SL 150

Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032 with cut conforming to DIN 8033, flattened tip.

GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)





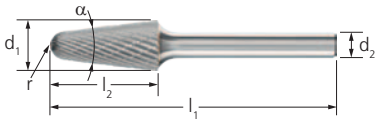
Ordering notes:
- Please complete the description with the desired cut.

Safety notes:

Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

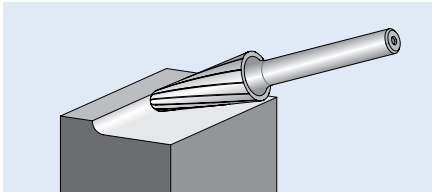
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 3 PLUS HC-FEP	Cut 4	Cut 5		Description
				EAN 4007220							
Shank dia. 3 mm											
3	7	3	37	-	-	049921	-	470626	049907	1	SPG 0307/3 Z ...
	13	3	43	-	-	049952	-	393208	049938	1	SPG 0313/3 Z ...
6	13	3	43	-	-	049983	-	393215	049969	1	SPG 0613/3 Z ...
Long shank dia. of 3 mm, SL/GL 75 mm											
3	13	3	75	-	-	779972	-	-	779965	1	SPG 0313/3 Z ... GL 75
6	13	3	88	-	-	779828	-	-	779811	1	SPG 0613/3 Z ... SL 75
Shank dia. 6 mm											
6	18	6	55	047934	047927	047941	835630	047965	047972	1	SPG 0618/6 Z ...
8	20	6	60	-	-	955512	-	-	955543	1	SPG 0820/6 Z ...
10	20	6	60	048016	047996	048023	-	048061	048085	1	SPG 1020/6 Z ...
12	25	6	65	048139	048115	048146	835654	048184	048207	1	SPG 1225/6 Z ...
	30	6	70	048368	048344	048382	-	048429	048443	1	SPG 1230/6 Z ...
16	30	6	70	048252	048238	048276	-	048313	-	1	SPG 1630/6 Z ...
Long shank dia. of 6 mm, SL 150 mm											
6	18	6	172	-	-	090497	-	-	-	1	SPG 0618/6 Z ... SL 150
8	20	6	170	-	-	955611	-	-	-	1	SPG 0820/6 Z ... SL 150
10	20	6	170	-	-	090640	-	-	-	1	SPG 1020/6 Z ... SL 150
12	25	6	175	-	-	955628	-	-	-	1	SPG 1225/6 Z ... SL 150
Shank dia. 8 mm											
10	20	8	60	-	-	048030	-	-	-	1	SPG 1020/8 Z ...
12	25	8	65	-	-	048153	-	-	-	1	SPG 1225/8 Z ...
16	30	8	70	048269	-	048283	-	-	-	1	SPG 1630/8 Z ...

TC burrs for universal applications
For fine and coarse stock removal



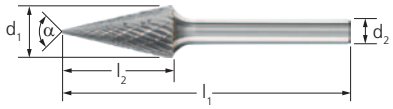
Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032 with cut conforming to DIN 8033.



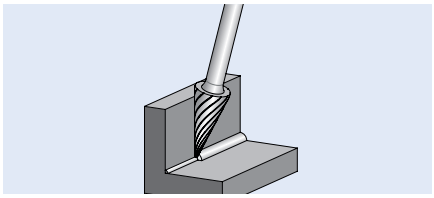
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 4	Cut 5		Description
						EAN 4007220						
Shank dia. 6 mm												
8	20	6	60	16°	1.25	-	-	955581	955604	-	1	KEL 0820/6 Z ...
10	20	6	60	14°	2.9	-	048467	048481	048504	-	1	KEL 1020/6 Z ...
12	25	6	65	14°	3.3	-	048528	048559	048597	-	1	KEL 1225/6 Z ...
	30	6	70	14°	2.6	048627	048603	048634	048672	048689	1	KEL 1230/6 Z ...
16	30	6	70	14°	4.8	-	-	048719	048733	-	1	KEL 1630/6 Z ...
Shank dia. 8 mm												
12	25	8	65	14°	3.3	-	-	048566	-	-	1	KEL 1225/8 Z ...
	30	8	70	14°	2.6	-	-	048641	-	-	1	KEL 1230/8 Z ...



Conical pointed shape SKM

Conical pointed burr according to DIN 8032 with cut conforming to DIN 8033, flattened tip.



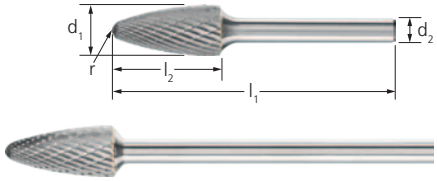
Ordering notes:
- Please complete the description with the desired cut.

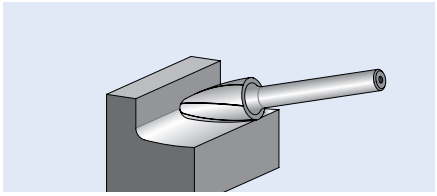
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 1	Cut 3	Cut 3 PLUS	Cut 4	Cut 5		Description
					EAN 4007220						
Shank dia. 3 mm											
3	7	3	37	21°	-	-	049839	-	049822	1	SKM 0307/3 Z ...
	11	3	41	14°	-	-	049853	451816	049846	1	SKM 0311/3 Z ...
6	13	3	43	25°	-	-	049877	-	049860	1	SKM 0613/3 Z ...
Shank dia. 6 mm											
6	18	6	55	18°	047286	047279	047293	047316	047323	1	SKM 0618/6 Z ...
10	20	6	60	28°	-	047330	047354	047378	047385	1	SKM 1020/6 Z ...
12	25	6	65	26°	047415	047392	047422	047460	047477	1	SKM 1225/6 Z ...
Shank dia. 8 mm											
12	25	8	65	26°	-	-	047439	-	-	1	SKM 1225/8 Z ...

Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 with cut conforming to DIN 8033.

GL = total length (solid tungsten carbide)
SL = shank length (long steel shank)



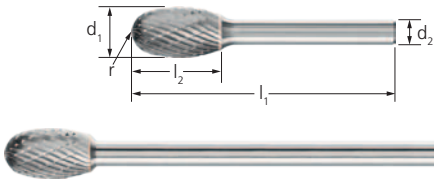


Ordering notes:
- Please complete the description with the desired cut.

Safety notes:

Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

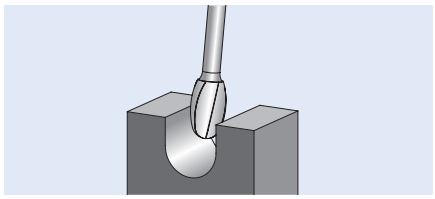
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 3 PLUS HC-FEP	Cut 4	Cut 5		Description
					EAN 4007220							
Shank dia. 3 mm												
3	7	3	37	0.75	-	-	049891	-	-	049884	1	RBF 0307/3 Z ...
	13	3	43	0.75	-	-	955550	-	-	955567	1	RBF 0313/3 Z ...
6	13	3	43	1.5	-	-	050019	-	400722	049990	1	RBF 0613/3 Z ...
Long shank dia. of 3 mm, GL 75 mm												
3	7	3	75	0.75	-	-	780015	-	-	780008	1	RBF 0307/3 Z ... GL 75
6	13	3	88	1.5	-	-	779996	-	-	779989	1	RBF 0613/3 Z ... SL 75
Shank dia. 6 mm												
6	18	6	55	1.5	-	047590	047606	835616	047620	047637	1	RBF 0618/6 Z ...
8	20	6	60	1.2	-	047644	047651	-	047675	-	1	RBF 0820/6 Z ...
10	20	6	60	2.5	-	047682	047705	-	047729	047736	1	RBF 1020/6 Z ...
12	25	6	65	2.5	047774	047750	047781	835623	047828	047835	1	RBF 1225/6 Z ...
16	30	6	70	3.6	-	047859	047873	-	047910	-	1	RBF 1630/6 Z ...
Long shank dia. of 6 mm, SL 150 mm												
6	18	6	172	1.5	-	-	090657	-	-	-	1	RBF 0618/6 Z ... GL 150
8	20	6	170	1.2	-	-	617731	-	-	-	1	RBF 0820/6 Z ... SL 150
10	20	6	170	2.5	-	-	090756	-	-	-	1	RBF 1020/6 Z ... SL 150
12	25	6	175	2.5	-	-	617748	-	-	-	1	RBF 1225/6 Z ... SL 150
Shank dia. 8 mm												
12	25	8	65	2.5	-	-	047798	-	-	-	1	RBF 1225/8 Z ...
16	30	8	70	3.6	-	-	047880	-	-	-	1	RBF 1630/8 Z ...



Oval shape TRE

Oval burr according to DIN 8032 with cut conforming to DIN 8033.

GL = total length (solid tungsten carbide), SL = shank length (long steel shank)

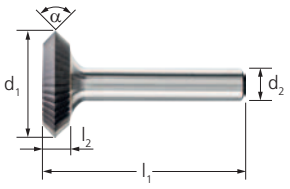


Ordering notes:
- Please complete the description with the desired cut.

Safety notes:

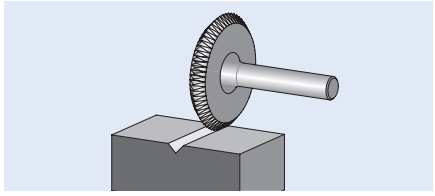
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut 1	Cut 3	Cut 3 PLUS	Cut 4	Cut 5		Description
							EAN 4007220				
Shank dia. 3 mm											
3	7	3	37	1.2	-	-	049754	-	049747	1	TRE 0307/3 Z ...
6	10	3	40	2.8	-	-	050040	-	050026	1	TRE 0610/3 Z ...
Long shank dia. of 3 mm, SL/GL 75 mm											
3	7	3	75	1.2	-	-	779804	-	779798	1	TRE 0307/3 Z ... GL 75
6	10	3	85	2.8	-	-	779781	-	779774	1	TRE 0610/3 Z ... SL 75
Shank dia. 6 mm											
6	10	6	50	2.8	-	-	048771	-	048801	1	TRE 0610/6 Z ...
8	13	6	53	3.7	-	-	048894	048917	048924	1	TRE 0813/6 Z ...
10	16	6	56	4.0	-	-	048832	048856	-	1	TRE 1016/6 Z ...
12	20	6	60	5.0	048955	048931	048962	049006	049020	1	TRE 1220/6 Z ...
16	25	6	65	6.5	049075	-	049099	049136	-	1	TRE 1625/6 Z ...
Long shank dia. of 6 mm, SL 150 mm											
6	10	6	160	2.8	-	-	090817	-	-	1	TRE 0610/6 Z ... SL 150
8	13	6	163	3.7	-	-	617700	-	-	1	TRE 0813/6 Z ... SL 150
10	16	6	166	4.0	-	-	090824	-	-	1	TRE 1016/6 Z ... SL 150
12	20	6	170	5.0	-	-	617724	-	-	1	TRE 1220/6 Z ... SL 150
Shank dia. 8 mm											
12	20	8	60	5.0	-	-	048979	-	-	1	TRE 1220/8 Z ...
16	25	8	65	6.5	-	-	049105	-	-	1	TRE 1625/8 Z ...



Rim shape N

Rim-shaped burr, circumferential cut is 90° and symmetric, tapered tip. The rim shape is particularly well suited to producing and processing prism-shaped keyways.



d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3		Description
					EAN 4007220		
Shank dia. 8 mm							
25	3	8	43	90°	048740	1	N 2503/8 Z3
	6	8	46	90°	048757	1	N 2506/8 Z3

Set 1500 cuts 3 PLUS and 5

Set 1500 – cuts 3 PLUS and 5 – contains 22 tungsten carbide burrs in the most common shapes and dimensions for general applications. The sturdy plastic box protects the tools from dirt and damage.

Contents:
22 tungsten carbide burrs,
shank diameter of 6 mm, cut 3 PLUS
1 piece each:

ZYAS 0616/6 Z3 PLUS	KUD 0807/6 Z3 PLUS	WRC 1225/6 Z3 PLUS	SKM 0618/6 Z3 PLUS
ZYAS 1013/6 Z3 PLUS	KUD 1210/6 Z3 PLUS	SPG 0618/6 Z3 PLUS	SKM 1020/6 Z3 PLUS
ZYAS 1225/6 Z3 PLUS	KUD 1614/6 Z3 PLUS	SPG 1020/6 Z3 PLUS	
KUD 0605/6 Z3 PLUS	WRC 0616/6 Z3 PLUS	SPG 1225/6 Z3 PLUS	

Shank diameter of 3 mm, cut 5
1 piece each:

ZYAS 0210/3 Z5	WRC 0210/3 Z5	SPG 0307/3 Z5	TRE 0307/3 Z5
ZYAS 0313/3 Z5	WRC 0313/3 Z5	RBF 0307/3 Z5	WKN 0307/3 Z5

Cut		Description
3 PLUS, 5		
EAN 4007220		
Shank dia. 3 and 6 mm		
055885	1	1500 Z3 PLUS/Z5

Set 1501 cut 5

Set 1501 – cut 5 – contains 15 small tungsten carbide burrs in the most common shapes and dimensions for general applications. The sturdy plastic box protects the tools from dirt and damage.

Contents:
15 tungsten carbide burrs,
shank diameter of 3 mm, cut 5
1 piece each:

ZYAS 0210/3 Z5	B 0307/3 Z5	SPG 0307/3 Z5	TRE 0307/3 Z5
ZYAS 0313/3 Z5	KUD 0403/3 Z5	SKM 0613/3 Z5	TRE 0610/3 Z5
ZYAS 0607/3 Z5	WRC 0210/3 Z5	RBF 0307/3 Z5	WKNS 0307/3 Z5
ZYAS 0613/3 Z5	WRC 0313/3 Z5	RBF 0613/3 Z5	

Cut		Description
5		
EAN 4007220		
Shank dia. 3 mm		
055892	1	1501 Z5

TC burr sets for universal applications
For fine and coarse stock removal

Set 1506 cut 3 PLUS

Set 1506 – cut 3 PLUS – contains five tungsten carbide burrs in the shapes and dimensions most commonly used in the workshop.
The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.
Five further unused slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm, cut 3 PLUS
1 piece each:
ZYA 0616/6 Z3 PLUS
KUD 0605/6 Z3 PLUS
WRC 0616/6 Z3 PLUS
SPG 0618/6 Z3 PLUS
RBF 0618/6 Z3 PLUS

Cut		Description
3 PLUS		
EAN 4007220		
Shank dia. 6 mm		
801017	1	1506 Z3 PLUS

Set 1512 cut 3 PLUS

Set 1512 – cut 3 PLUS – contains five tungsten carbide burrs in the shapes and dimensions most commonly used in the workshop.
The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.
Five further unused slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm, cut 3 PLUS
1 piece each:
ZYA 1225/6 Z3 PLUS
KUD 1210/6 Z3 PLUS
WRC 1225/6 Z3 PLUS
SPG 1225/6 Z3 PLUS
RBF 1225/6 Z3 PLUS

Cut		Description
3 PLUS		
EAN 4007220		
Shank dia. 6 mm		
801338	1	1512 Z3 PLUS

Burrs (shank dia. 3, 6 and 8 mm) can be extended with drive spindle extensions. They allow access to hard-to-reach areas. The drive spindle extension is mounted in the collet of the tool drive (air-powered or electric), or in the handpiece of the flexible shaft drive. In some applications, spindle extensions are an economical alternative to customized burrs with long shanks.

Safety notes:

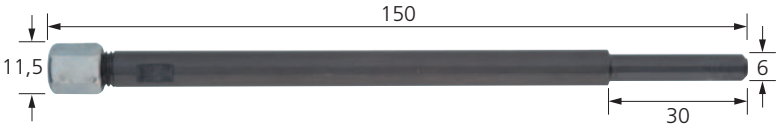
- For safety reasons, it is not possible to use drive spindle extensions in combination with long-shank burrs.
- For additional safety notes, please refer to catalogue section 9.

= Read the safety notes!

More detailed information and ordering data for drive spindle extensions can be found in catalogue section 9.

Extension SPV 150-3 S6 for shank diameter of 3 mm

EAN 4007220**185308**

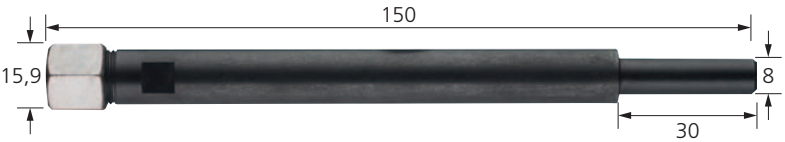


Extension SPV 150-6 S8 for shank diameter of 6 mm

EAN 4007220**185315**

Extension SPV 150-8 S8 for shank diameter of 8 mm

EAN 4007220**184400**

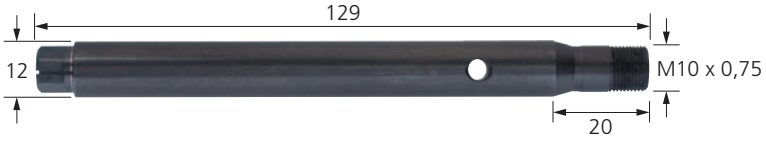


Extension SPV 100-6 S8 for shank diameter of 6 mm

EAN 4007220**185261**

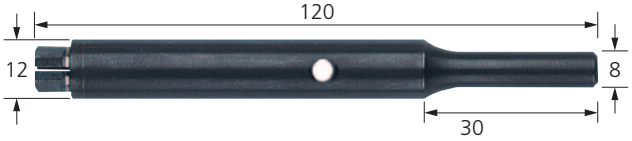
Extension SPV 100-6 SPG 6 for shank diameter of 6 mm

EAN 4007220**656051**



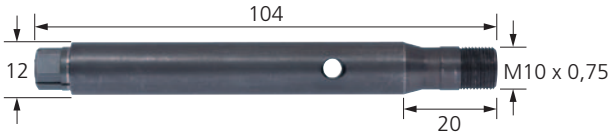
Extension SPV 75-6 S8 for shank diameter of 6 mm

EAN 4007220**185278**



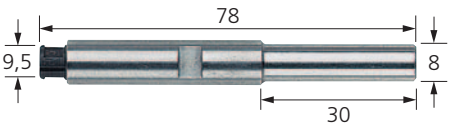
Extension SPV 75-6 SPG 6 for shank diameter of 6 mm

EAN 4007220**333143**



Extension SPV 50-3 S8 for shank diameter of 3 mm

EAN 4007220**185254**



TC burrs for high-performance applications

ALLROUND cut for versatile use

With the innovative ALLROUND cut, PFERD has developed unique burrs for versatile use on key materials such as steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. The ALLROUND cut offers all the benefits of the tried-and-tested 3 PLUS cut, but its stock removal rate is up to 30 % higher for steel. It enables comfortable working with reduced vibration and less noise. They also offer significant time savings and a high economic value.

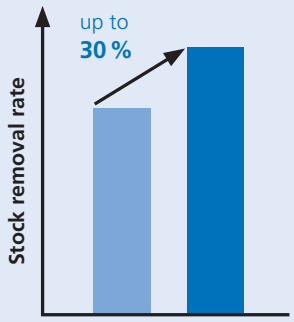
Advantages:

- Significantly better stock removal rate than burrs with a conventional cross cut.
- Saves money and time through its very high stock removal rate on key materials.
- Comfortable working with reduced vibration and less noise.

Materials that can be worked:

- Steel, cast steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron

Performance values for applications on steel



- Conventional burrs with cross cut
- Tungsten carbide burrs, ALLROUND cut

Applications:

- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives: from 300 watts.
- Please observe the rotational speed recommendations.

Matching tool drives:

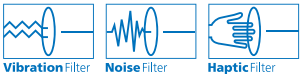
- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

Safety note:

- The very high stock removal rate can cause discolouration on the shank. This does not constitute a safety risk.

PFERDVALUE:

PFERDERGONOMICS recommends burrs with ALLROUND cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.



PFERDEFFICIENCY recommends burrs with ALLROUND cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Refer to the table for the cutting speed.

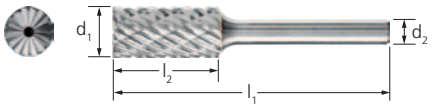
❷ Select the required burr diameter.

❸ The cutting speed range and the burr diameter determine the recommended rotational speed range.

❶ Material group			❷ Application	❸ Cut	❹ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal	ALLROUND	450–750 m/min
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	ALLROUND	250–450 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	ALLROUND	450–600 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys, brass, copper, zinc	Coarse stock removal	ALLROUND	450–750 m/min
	Hard non-ferrous metals	Bronze, titanium/titanium alloys, hard aluminium alloys (high Si content)	Coarse stock removal	ALLROUND	450–600 m/min
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal	ALLROUND	450–900 m/min

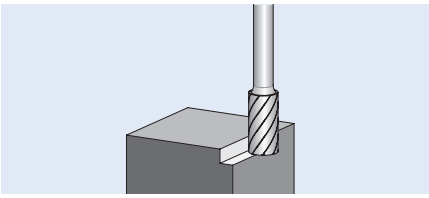
Example:
TC burr,
ALLROUND cut,
burr dia. 12 mm.
Coarse stock removal on steels up to 1,200 N/mm².
Cutting speed: 450–750 m/min
Rotational speed range: 12,000–20,000 RPM

❺ Burr dia. [mm]	❻ Cutting speeds [m/min]				
	250	450	600	750	900
	Rotational speeds [RPM]				
6	13,000	24,000	32,000	40,000	48,000
8	10,000	18,000	24,000	30,000	36,000
10	8,000	14,000	19,000	24,000	29,000
12	7,000	12,000	16,000	20,000	24,000
16	5,000	9,000	12,000	15,000	18,000



Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.



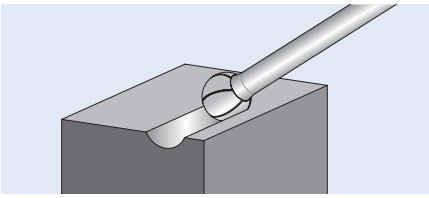
PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm						
6	16	6	55	092866	1	ZYAS 0616/6 ALLROUND
8	20	6	60	092897	1	ZYAS 0820/6 ALLROUND
10	20	6	60	092903	1	ZYAS 1020/6 ALLROUND
12	25	6	65	092941	1	ZYAS 1225/6 ALLROUND
16	25	6	65	092958	1	ZYAS 1625/6 ALLROUND

Ball shape KUD

Ball-shaped burr according to DIN 8032.



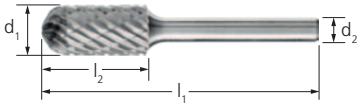
PFERDVALUE:

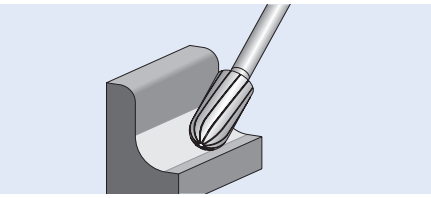
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm						
6	5	6	45	093009	1	KUD 0605/6 ALLROUND
8	7	6	47	093030	1	KUD 0807/6 ALLROUND
10	9	6	49	093108	1	KUD 1009/6 ALLROUND
12	10	6	51	093115	1	KUD 1210/6 ALLROUND
16	14	6	54	093146	1	KUD 1614/6 ALLROUND

Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.





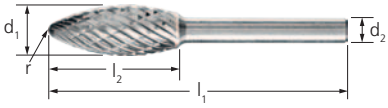
PFERDVALUE:

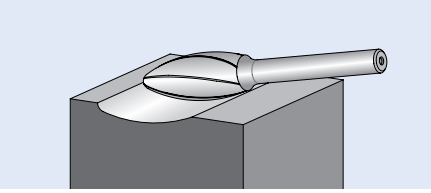
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm						
6	16	6	55	093153	1	WRC 0616/6 ALLROUND
8	20	6	60	093184	1	WRC 0820/6 ALLROUND
10	20	6	60	093191	1	WRC 1020/6 ALLROUND
12	25	6	65	093221	1	WRC 1225/6 ALLROUND
16	25	6	65	093238	1	WRC 1625/6 ALLROUND

Flame shape B

Flame-shaped burr according to ISO 7755/8.



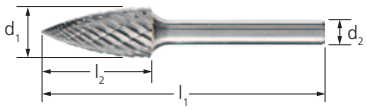


PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

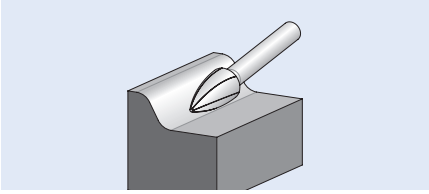
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm							
8	20	6	60	1.5	093269	1	B 0820/6 ALLROUND
10	25	6	65	1.7	093276	1	B 1025/6 ALLROUND
12	30	6	70	2.1	093306	1	B 1230/6 ALLROUND
16	35	6	75	2.6	093313	1	B 1635/6 ALLROUND

TC burrs for high-performance applications
ALLROUND cut for versatile use



Pointed tree shape SPG

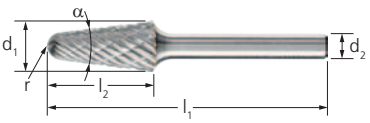
Pointed tree-shaped burr according to DIN 8032, flattened tip.



PFERDVALUE:

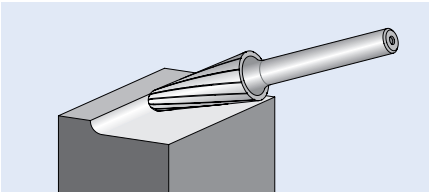
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm						
6	18	6	55	093344	1	SPG 0618/6 ALLROUND
8	20	6	60	093351	1	SPG 0820/6 ALLROUND
10	20	6	60	093382	1	SPG 1020/6 ALLROUND
12	25	6	65	093399	1	SPG 1225/6 ALLROUND
16	30	6	70	093436	1	SPG 1630/6 ALLROUND



Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.



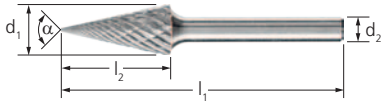
PFERDVALUE:

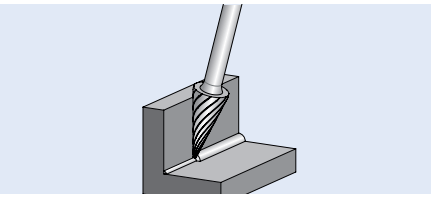
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm								
8	20	6	60	16°	1.25	093481	1	KEL 0820/6 ALLROUND
10	20	6	60	14°	2.9	093498	1	KEL 1020/6 ALLROUND
12	25	6	70	14°	3.3	093535	1	KEL 1225/6 ALLROUND
16	30	6	70	14°	4.8	093542	1	KEL 1630/6 ALLROUND

Conical pointed shape SKM

Conical pointed burr according to DIN 8032 with cut conforming to DIN 8033, flattened tip.





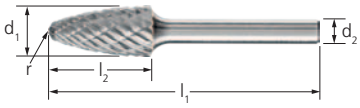
PFERDVALUE:

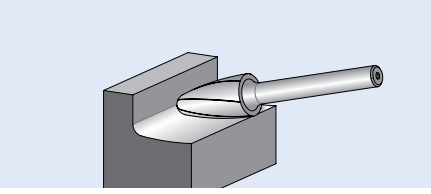
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut ALLROUND		Description
					EAN 4007220		
Shank dia. 6 mm							
6	18	6	55	18°	093696	1	SKM 0618/6 ALLROUND
8	20	6	60	22°	093702	1	SKM 0820/6 ALLROUND
10	20	6	60	28°	093719	1	SKM 1020/6 ALLROUND
12	25	6	65	26°	093726	1	SKM 1225/6 ALLROUND

Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.

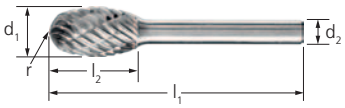




PFERDVALUE:

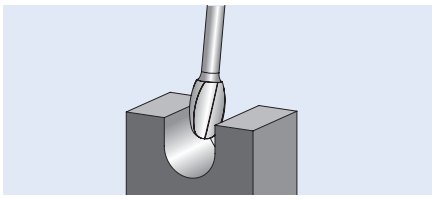
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut ALLROUND		Description
					EAN 4007220		
Shank dia. 6 mm							
6	18	6	55	1.5	093580	1	RBF 0618/6 ALLROUND
8	20	6	60	1.2	093641	1	RBF 0820/6 ALLROUND
10	20	6	60	2.5	093658	1	RBF 1020/6 ALLROUND
12	25	6	65	2.5	093672	1	RBF 1225/6 ALLROUND
16	30	6	70	3.6	093689	1	RBF 1630/6 ALLROUND



Oval shape TRE

Oval burr according to DIN 8032 with cut conforming to DIN 8033.



PFERDVALUE:

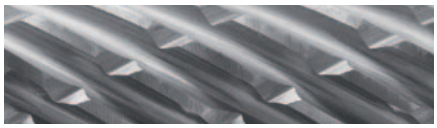
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut ALLROUND EAN 4007220		Description
Shank dia. 6 mm							
6	10	6	50	2.8	093733	1	TRE 0610/6 ALLROUND
8	13	6	53	3.7	093740	1	TRE 0813/6 ALLROUND
10	16	6	56	4.0	093757	1	TRE 1016/6 ALLROUND
12	20	6	60	5.0	093764	1	TRE 1220/6 ALLROUND
16	25	6	65	6.5	093771	1	TRE 1625/6 ALLROUND

TC burrs for high-performance applications

STEEL cut for steel and cast steel

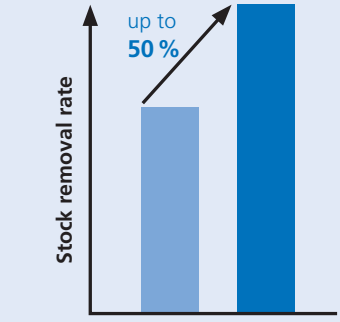
With the innovative STEEL cut, PFERD has developed unique burrs for working with steel and cast steel. They are characterized by significantly increased aggressiveness and good guidance. Thus they ensure safe and precise work.
The extremely high stock removal rate makes burrs with the STEEL cut impressive, with significant time savings and a high economic value.



Advantages:

- Up to 50 % higher stock removal rate when used on steel and cast steel in comparison to conventional cross-cut burrs.
- Significantly increased aggressiveness, large chips and very good chip removal through the innovative tooth geometry.
- Workpiece is protected through much lower thermal load.

Performance values for applications on steel and cast steel



- Conventional burrs with cross cut
- Tungsten carbide burrs, STEEL cut

Applications:

- Milling out
- Levelling
- deburring
- Cutting out holes
- Surface work
- Work on weld seams

Materials that can be worked:

- Steel
- Cast steel

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives: from 300 watts.
- Please observe the rotational speed recommendations.

Matching tool drives:

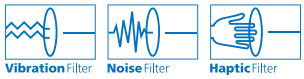
- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

Safety note:

- The very high stock removal rate can cause discolouration on the shank. This does not constitute a safety risk.

PFERDVALUE:

PFERDERGONOMICS recommends burrs with STEEL cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.



PFERDEFFICIENCY recommends burrs with STEEL cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

More PFERD tools and information on working with steel can be found in our PRAXIS brochure "PFERD tools for use on construction steel".

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Refer to the table for the cutting speed.
❷ Select the required burr diameter.
❸ The cutting speed range and the burr diameter determine the recommended rotational speed range.

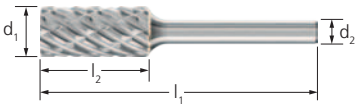
Safety note:

Please observe the reduced rotational speeds for burrs with a long shank. They can be found on page 11.

Material group			Application	Cut	❶ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal	STEEL	450–750 m/min
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel			

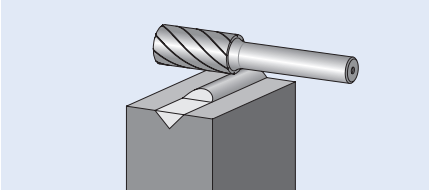
Example:
TC burr,
STEEL cut,
burr dia. of 12 mm.
Cutting speed: 450–750 m/min
Rotational speed range:
12,000–20,000 RPM

❷ Burr dia. [mm]	❸ Cutting speeds [m/min]	
	450	750
	Rotational speeds [RPM]	
6	24,000	40,000
8	18,000	30,000
10	14,000	24,000
12	12,000	20,000
16	9,000	15,000



Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032.



PFERDVALUE:

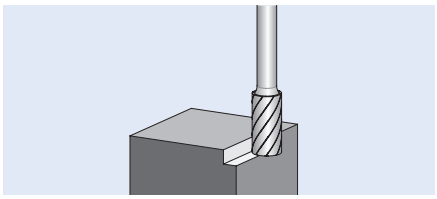
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

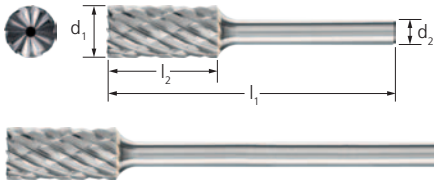
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	16	6	55	937198	24,000–40,000	1	ZYA 0616/6 STEEL
8	20	6	60	937211	18,000–30,000	1	ZYA 0820/6 STEEL
10	20	6	60	937235	14,000–24,000	1	ZYA 1020/6 STEEL
12	25	6	65	937242	12,000–20,000	1	ZYA 1225/6 STEEL
16	25	6	65	002360	9,000–15,000	1	ZYA 1625/6 STEEL

Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032. Shape ZYAS with circumferential and end cut.

SL = shank length (long steel shank)





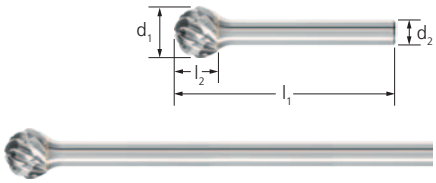
Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

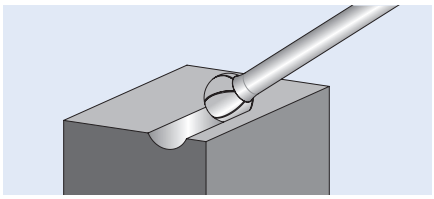
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	16	6	55	937259	24,000–40,000	1	ZYAS 0616/6 STEEL
8	20	6	60	937266	18,000–30,000	1	ZYAS 0820/6 STEEL
10	20	6	60	937310	14,000–24,000	1	ZYAS 1020/6 STEEL
12	25	6	65	937341	12,000–20,000	1	ZYAS 1225/6 STEEL
16	25	6	65	002889	9,000–15,000	1	ZYAS 1625/6 STEEL
Long shank dia. of 6 mm, SL 150 mm							
8	20	6	170	091173	11,000	1	ZYAS 0820/6 STEEL SL 150
10	20	6	170	091289	9,000	1	ZYAS 1020/6 STEEL SL 150
12	25	6	175	091982	7,000	1	ZYAS 1225/6 STEEL SL 150



Ball shape KUD

Ball-shaped burr according to DIN 8032.

SL = shank length (long steel shank)



Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

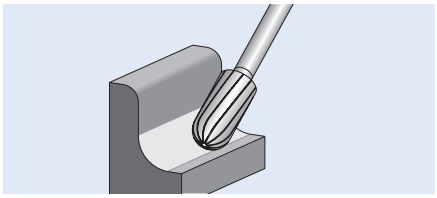
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

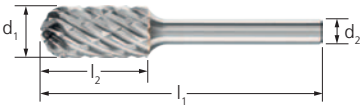
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	5	6	45	936832	24,000–40,000	1	KUD 0605/6 STEEL
8	7	6	47	936849	18,000–30,000	1	KUD 0807/6 STEEL
10	9	6	49	936863	14,000–24,000	1	KUD 1009/6 STEEL
12	10	6	51	936870	12,000–20,000	1	KUD 1210/6 STEEL
16	14	6	54	003008	9,000–15,000	1	KUD 1614/6 STEEL
Long shank dia. of 6 mm, SL 150 mm							
10	9	6	159	092002	9,000	1	KUD 1009/6 STEEL SL 150
12	10	6	160	087206	7,000	1	KUD 1210/6 STEEL SL 150

Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.

SL = shank length (long steel shank)





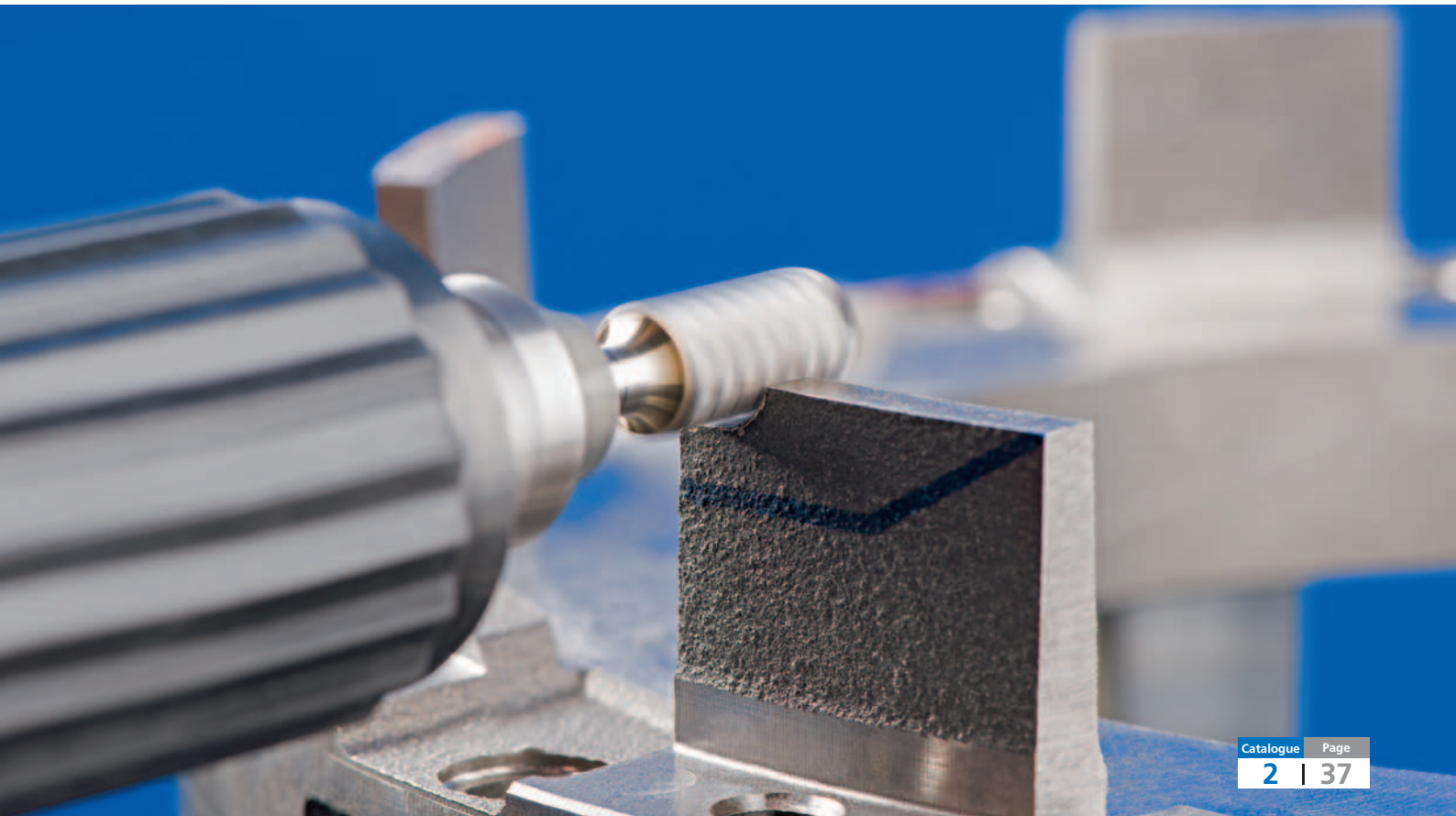
Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

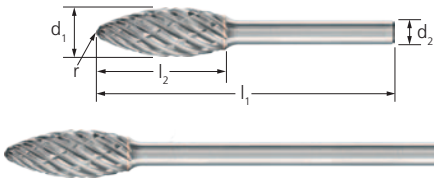
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	16	6	55	937129	24,000–40,000	1	WRC 0616/6 STEEL
8	20	6	60	937150	18,000–30,000	1	WRC 0820/6 STEEL
10	20	6	60	937174	14,000–24,000	1	WRC 1020/6 STEEL
12	25	6	65	936696	12,000–20,000	1	WRC 1225/6 STEEL
16	25	6	65	003022	9,000–15,000	1	WRC 1625/6 STEEL
Long shank dia. of 6 mm, SL 150 mm							
8	20	6	170	092309	11,000	1	WRC 0820/6 STEEL SL 150
10	20	6	170	092422	9,000	1	WRC 1020/6 STEEL SL 150
12	25	6	175	092439	7,000	1	WRC 1225/6 STEEL SL 150



TC burrs for high-performance applications

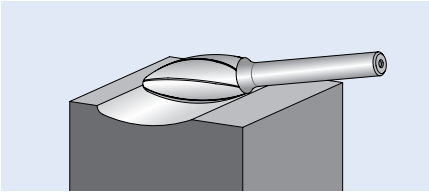
STEEL cut for steel and cast steel



Flame shape B

Flame-shaped burr according to ISO 7755/8.

SL = shank length (long steel shank)



Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

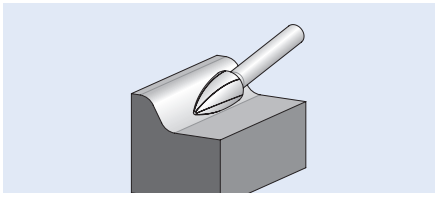
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

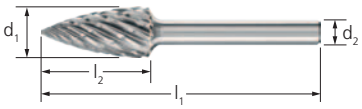
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm								
8	20	6	60	1.5	936719	18,000–30,000	1	B 0820/6 STEEL
10	25	6	65	1.7	092590	14,000–24,000	1	B 1025/6 STEEL
12	30	6	70	2.1	936764	12,000–20,000	1	B 1230/6 STEEL
16	35	6	75	2.6	003039	9,000–15,000	1	B 1635/6 STEEL
Long shank dia. of 6 mm, SL 150 mm								
10	25	6	175	1.7	092446	9,000	1	B 1025/6 STEEL SL 150
12	30	6	180	2.1	092453	7,000	1	B 1230/6 STEEL SL 150

Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032, flattened tip.

SL = shank length (long steel shank)





Safety notes:

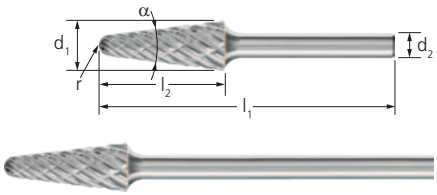
The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	18	6	55	936979	24,000–40,000	1	SPG 0618/6 STEEL
8	20	6	60	936993	18,000–30,000	1	SPG 0820/6 STEEL
10	20	6	60	937013	14,000–24,000	1	SPG 1020/6 STEEL
12	25	6	65	937082	12,000–20,000	1	SPG 1225/6 STEEL
16	30	6	70	003046	9,000–15,000	1	SPG 1630/6 STEEL
Long shank dia. of 6 mm, SL 150 mm							
8	20	6	170	092460	11,000	1	SPG 0820/6 STEEL SL 150
10	20	6	170	092477	9,000	1	SPG 1020/6 STEEL SL 150
12	25	6	175	092484	7,000	1	SPG 1225/6 STEEL SL 150

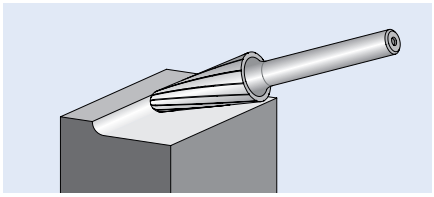
TC burrs for high-performance applications
STEEL cut for steel and cast steel



Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.

SL = shank length (long steel shank)



Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

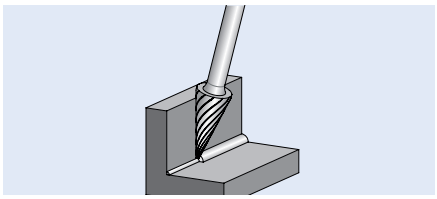
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm									
10	20	6	60	14°	2.9	936771	14,000–24,000	1	KEL 1020/6 STEEL
12	30	6	70	14°	2.6	936818	12,000–20,000	1	KEL 1230/6 STEEL
16	30	6	70	14°	4.8	003053	9,000–15,000	1	KEL 1630/6 STEEL
Long shank dia. of 6 mm, SL 150 mm									
10	20	6	170	14°	2.9	092576	9,000	1	KEL 1020/6 STEEL SL 150
12	30	6	180	14°	2.6	092583	7,000	1	KEL 1230/6 STEEL SL 150

Conical pointed shape SKM

Conical pointed burr according to DIN 8032 with cut conforming to DIN 8033, flattened tip.

SL = shank length (long steel shank)



Safety notes:

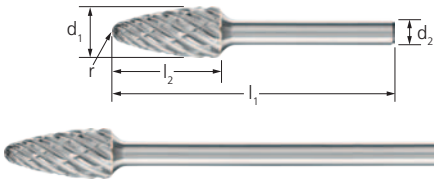
The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm								
6	18	6	55	18°	092736	24,000–40,000	1	SKM 0618/6 STEEL
8	20	6	60	22°	092774	18,000–30,000	1	SKM 0820/6 STEEL
10	20	6	60	28°	092781	14,000–24,000	1	SKM 1020/6 STEEL
12	25	6	65	26°	092859	12,000–20,000	1	SKM 1225/6 STEEL
Long shank dia. of 6 mm, SL 150 mm								
10	20	6	170	28°	092545	9,000	1	SKM 1020/6 STEEL SL 150
12	25	6	175	26°	092569	7,000	1	SKM 1225/6 STEEL SL 150

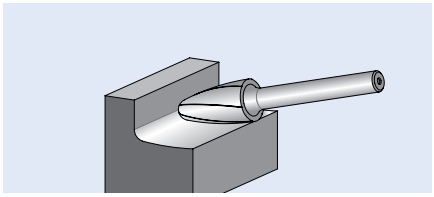
TC burrs for high-performance applications
STEEL cut for steel and cast steel



Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.

SL = shank length (long steel shank)



Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

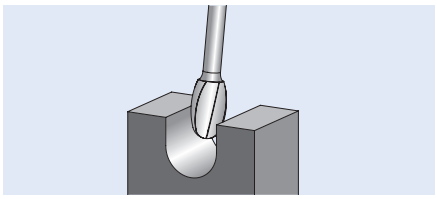
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

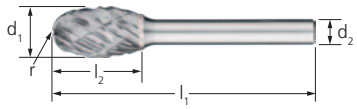
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm								
6	18	6	55	1.5	936887	24,000–40,000	1	RBF 0618/6 STEEL
8	20	6	60	1.2	936900	18,000–30,000	1	RBF 0820/6 STEEL
10	20	6	60	2.5	936924	14,000–24,000	1	RBF 1020/6 STEEL
12	25	6	65	2.5	936931	12,000–20,000	1	RBF 1225/6 STEEL
16	30	6	70	3.6	003060	9,000–15,000	1	RBF 1630/6 STEEL
Long shank dia. of 6 mm, SL 150 mm								
8	20	6	170	1.2	092491	11,000	1	RBF 0820/6 STEEL SL 150
10	20	6	170	2.5	092507	9,000	1	RBF 1020/6 STEEL SL 150
12	25	6	175	2.5	092514	7,000	1	RBF 1225/6 STEEL SL 150

Oval shape TRE

Oval burr according to ISO 7755/8.

SL = shank length (long steel shank)





Safety notes:

The rotational speeds for long-shank burrs relate to applications where the tool is in contact with the workpiece. More safety notes can be found on page 11.

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut STEEL EAN 4007220	RPM		Description
Shank dia. 6 mm								
8	13	6	53	3.7	092637	18,000–30,000	1	TRE 0813/6 STEEL
10	16	6	56	4.0	092644	14,000–24,000	1	TRE 1016/6 STEEL
12	20	6	60	5.0	092682	12,000–20,000	1	TRE 1220/6 STEEL
16	25	6	65	6.5	092729	9,000–15,000	1	TRE 1625/6 STEEL
Long shank dia. of 6 mm, SL 150 mm								
10	16	6	160	4.0	092521	9,000	1	TRE 1016/6 STEEL SL 150
12	20	6	170	5.0	092538	7,000	1	TRE 1220/6 STEEL SL 150

Set 1812 STEEL

Set 1812 STEEL contains five tungsten carbide burrs for processing steel and cast steel in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage. The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools. Five further slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm,
STEEL cut
1 piece each:
ZYA 1225/6 STEEL
KUD 1210/6 STEEL
WRC 1225/6 STEEL
SPG 1225/6 STEEL
RBF 1225/6 STEEL

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

Cut STEEL EAN 4007220		Description
Shank dia. 6 mm		
004357	1	1812 STEEL

TC burrs for high-performance applications
INOX cut for stainless steel (INOX)

With the INOX cut, PFERD has developed innovative burrs for work on stainless steel (INOX). The INOX cut is characterized by an extremely high stock removal rate on all austenitic as well as rust- and acid-resistant steels. It creates significantly less vibration than a comparable cross cut.

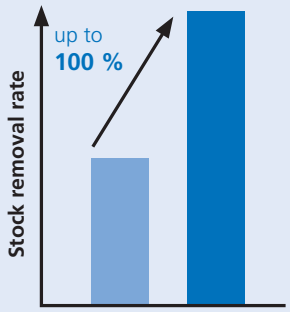
Advantages:

- Outstanding stock removal rate and tool life due to the innovative tooth geometry.
- Achieves high surface qualities through optimum chip formation.
- Prevents heat discolouration in the material due to the reduced heat generation.

Materials that can be worked:

- Stainless steel (INOX)
- Soft titanium alloys (tensile strength < 500 N/mm²)

Performance values for applications on stainless steel (INOX)



- Conventional burrs with cross cut
- Tungsten carbide burrs, INOX cut

Applications:

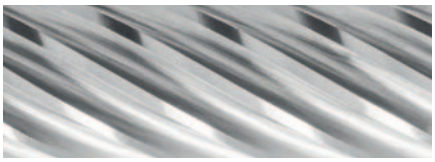
- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools



Safety note:

- The very high stock removal rate can cause discolouration on the shank. This does not constitute a safety risk.

PFERDVALUE:

PFERDERGONOMICS recommends burrs with INOX cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.

PFERDEFFICIENCY recommends burrs with INOX cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Select the material group to be machined.
❷ Refer to the table for the cutting speed.
❸ Select the required burr diameter.
❹ The cutting speed range and the burr diameter determine the recommended rotational speed range.

More PFERD tools and information on working with stainless steel (INOX) can be found in our PRAXIS brochure "PFERD tools for use on stainless steel (INOX)".

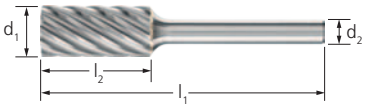
❶ Material group			Application	Cut	❷ Cutting speed
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	INOX	450–600 m/min
Non-ferrous metals	Non-ferrous metals	Titanium/titanium alloys	Coarse stock removal	INOX	250–450 m/min

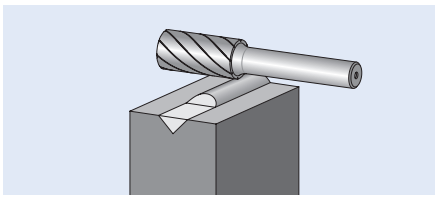
Example:
TC burr,
INOX cut,
burr dia. of 12 mm.
Coarse stock removal on stainless steel (INOX).
Cutting speed: 450–600 m/min
Rotational speed range:
12,000–16,000 RPM

❸ Burr dia. [mm]	❹ Cutting speeds [m/min]		
	250	450	600
	Rotational speeds [RPM]		
3	27,000	48,000	64,000
4	20,000	36,000	48,000
5	16,000	29,000	40,000
6	13,000	24,000	32,000
8	10,000	18,000	24,000
10	8,000	14,000	19,000
12	7,000	12,000	16,000

Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032.





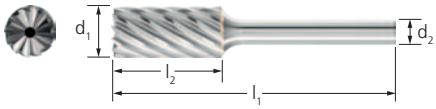
PFERDVALUE:

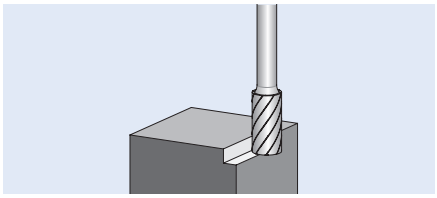
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	13	3	43	930380	27,000–64,000	1	ZYA 0313/3 INOX
6	13	3	43	930403	13,000–32,000	1	ZYA 0613/3 INOX
Shank dia. 6 mm							
6	16	6	55	900499	13,000–32,000	1	ZYA 0616/6 INOX
8	20	6	60	952245	10,000–24,000	1	ZYA 0820/6 INOX
10	20	6	60	952252	8,000–19,000	1	ZYA 1020/6 INOX
12	25	6	65	900505	7,000–16,000	1	ZYA 1225/6 INOX

Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.





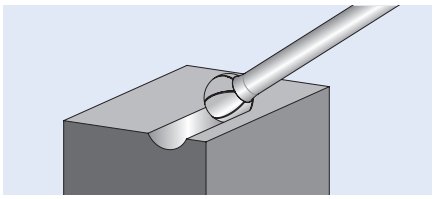
PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	13	3	43	034453	27,000–64,000	1	ZYAS 0313/3 INOX
6	13	3	43	034460	13,000–32,000	1	ZYAS 0613/3 INOX
Shank dia. 6 mm							
6	16	6	55	034477	27,000–64,000	1	ZYAS 0616/6 INOX
12	25	6	65	034484	7,000–16,000	1	ZYAS 1225/6 INOX

Ball shape KUD

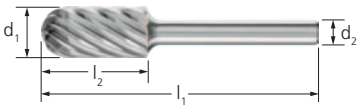
Ball-shaped burr according to DIN 8032.



PFERDVALUE:

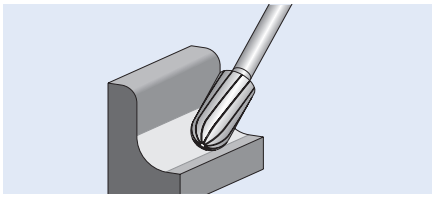
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	2	3	33	930434	27,000–64,000	1	KUD 0302/3 INOX
4	3	3	34	034439	20,000–48,000	1	KUD 0403/3 INOX
5	4	3	35	034446	16,000–40,000	1	KUD 0504/3 INOX
6	5	3	35	930441	13,000–32,000	1	KUD 0605/3 INOX
Shank dia. 6 mm							
6	5	6	45	900536	13,000–32,000	1	KUD 0605/6 INOX
8	7	6	47	952269	10,000–24,000	1	KUD 0807/6 INOX
10	9	6	49	952276	8,000–19,000	1	KUD 1009/6 INOX
12	10	6	51	900543	7,000–16,000	1	KUD 1210/6 INOX



Cylindrical shape with radius end WRC

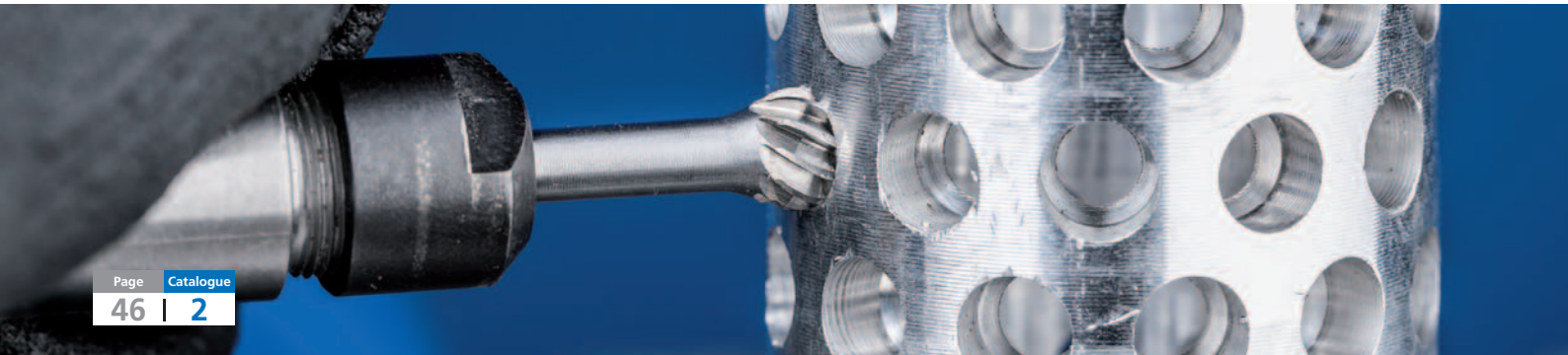
Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.



PFERDVALUE:

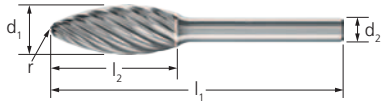
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

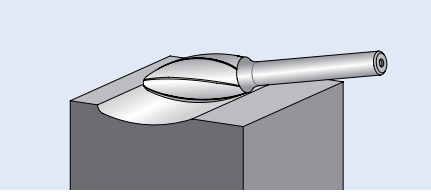
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	13	3	43	930410	27,000–64,000	1	WRC 0313/3 INOX
6	13	3	43	930427	13,000–32,000	1	WRC 0613/3 INOX
Shank dia. 6 mm							
6	16	6	55	900512	13,000–32,000	1	WRC 0616/6 INOX
8	20	6	60	952283	10,000–24,000	1	WRC 0820/6 INOX
10	20	6	60	952290	8,000–19,000	1	WRC 1020/6 INOX
12	25	6	65	900529	7,000–16,000	1	WRC 1225/6 INOX



Flame shape B

Flame-shaped burr according to ISO 7755/8.





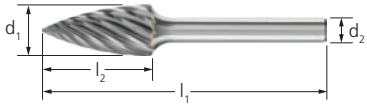
PFERDVALUE:

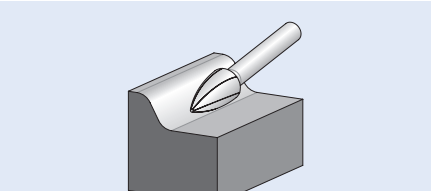
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 6 mm								
8	20	6	60	1.5	952306	10,000–24,000	1	B 0820/6 INOX
10	25	6	65	1.7	952313	8,000–19,000	1	B 1025/6 INOX
12	30	6	70	2.1	930502	7,000–16,000	1	B 1230/6 INOX

Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032, flattened tip.



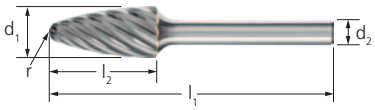


PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

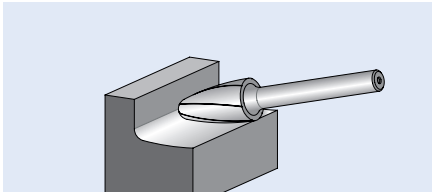
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	7	3	37	034491	27,000–64,000	1	SPG 0307/3 INOX
	13	3	43	034507	27,000–64,000	1	SPG 0313/3 INOX
6	13	3	43	034514	13,000–32,000	1	SPG 0613/3 INOX
Shank dia. 6 mm							
6	18	6	55	936948	13,000–32,000	1	SPG 0618/6 INOX
8	20	6	60	952320	10,000–24,000	1	SPG 0820/6 INOX
10	20	6	60	952337	8,000–19,000	1	SPG 1020/6 INOX
12	25	6	65	936894	7,000–16,000	1	SPG 1225/6 INOX

TC burrs for high-performance applications
INOX cut for stainless steel (INOX)



Tree shape with radius end RBF

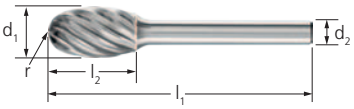
Tree-shaped burr with radius end according to DIN 8032.



PFERDVALUE:

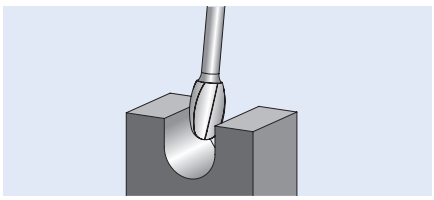
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 3 mm								
3	13	3	43	0.75	930472	27,000–64,000	1	RBF 0313/3 INOX
6	13	3	43	1.5	930489	13,000–32,000	1	RBF 0613/3 INOX
Shank dia. 6 mm								
6	18	6	55	1.5	900550	13,000–32,000	1	RBF 0618/6 INOX
8	20	6	60	1.2	952344	10,000–24,000	1	RBF 0820/6 INOX
10	20	6	60	2.5	952351	8,000–19,000	1	RBF 1020/6 INOX
12	25	6	65	2.5	900567	7,000–16,000	1	RBF 1225/6 INOX



Oval shape TRE

Oval burr according to DIN 8032.



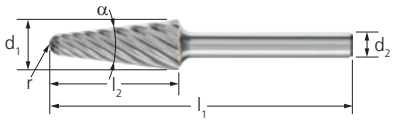
PFERDVALUE:

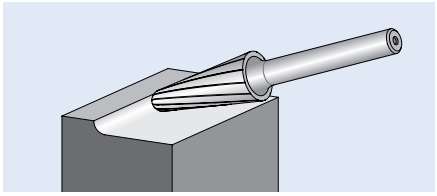
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 6 mm								
8	13	6	53	3.7	952368	10,000–24,000	1	TRE 0813/6 INOX
10	16	6	56	4.0	952375	8,000–19,000	1	TRE 1016/6 INOX
12	20	6	60	5.0	930519	7,000–16,000	1	TRE 1220/6 INOX

Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.





PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut INOX EAN 4007220	RPM		Description
Shank dia. 6 mm									
8	20	6	60	16°	1.25	952382	10,000–24,000	1	KEL 0820/6 INOX
10	20	6	60	14°	2.9	952399	8,000–19,000	1	KEL 1020/6 INOX
12	30	6	70	14°	2.6	930496	7,000–16,000	1	KEL 1230/6 INOX

Set 1912 INOX

Set 1912 INOX contains five tungsten carbide burrs for processing stainless steel (INOX) in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools. Five further slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm, INOX cut
1 piece each:
ZYA 1225/6 INOX
KUD 1210/6 INOX
WRC 1225/6 INOX
RBF 1225/6 INOX
SPG 1225/6 INOX

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

Cut INOX EAN 4007220		Description
Shank dia. 6 mm		
068816	1	1912 INOX

TC burrs for high-performance applications

ALU and NON-FERROUS cuts for aluminium/non-ferrous metals

When it comes to machining aluminium and non-ferrous metals, PFERD offers two high-performance cuts and a HICOAT coating which have been designed specifically for demanding machining tasks on long-chipping and lubricating materials.

Applications:

- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

Matching tool drives:

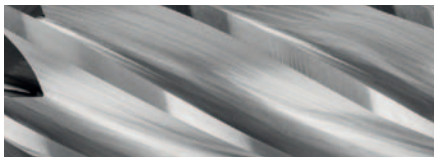
- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds.
  Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 500 watts
- Please observe the rotational speed recommendations.

More PFERD tools and a wealth of useful information on working with aluminium can be found in our PRAXIS brochure "PFERD tools for use on aluminium".

ALU cut

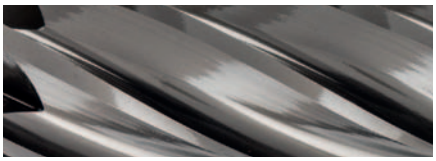


PFERD has further developed the ALU cut especially for stock removal on aluminium. This cut is characterized by its high stock removal rate.

Advantages:

- Extremely high stock removal rate.
- Large chips.
- Reduced material adhesion.
- Long tool life and smooth running.
- Can be used with cutting speeds of up to 1,100 m/min.

ALU cut with HICOAT coating HC-NFE



The use of burrs with the PFERD HICOAT coating HC-NFE prevents chips adhering during work on soft aluminium alloys. This increases the tool life and improves the surface quality of the workpiece.

Advantages:

- Mainly used for long-chipping and lubricating non-ferrous metals.
- Highest stock removal rate.
- Effective chip removal through improved anti-adhesion characteristics.
- Lower thermal loads.
- Longer service life.

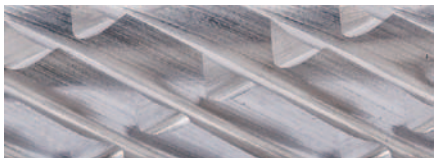
Materials that can be worked:

- Aluminium
- Bronze
- Copper
- Brass
- Titanium
- Titanium alloys
- Zinc
- Fibre-reinforced plastics (GRP/CRP)
- Thermoplastics

412 ALU grinding oil

Grinding oil can be used as an alternative to the HICOAT coating HC-NFE. **Grinding oil 412 ALU** in a 400 ml aerosol is particularly well suited: EAN 4007220**791332**. Detailed information on grinding oil 412 ALU can be found in catalogue section 4.

NON-FERROUS cut



PFERD has developed the NON-FERROUS cut for universal use on non-ferrous metals and fibre-reinforced plastics. This cut is characterized by its high stock removal rate.

Advantages:

- Very good stock removal rate when used on non-ferrous metals such as brass and copper, plastics and fibre-reinforced plastics.

Materials that can be worked:

- Bronze
- Copper
- Brass
- Zinc
- Fibre-reinforced plastics (GRP/CRP)
- Thermoplastics.

Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Determine the type of application.
❸ Select the cut.
❹ Establish the cutting speed range.

To determine the recommended rotational speed range [RPM], please proceed as follows:

❺ Select the required burr diameter.
❻ The cutting speed range and the burr diameter determine the recommended rotational speed range.

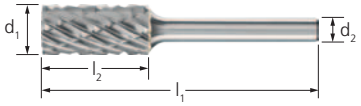
❶ Material group			❷ Application	❸ Cut	❹ Cutting speed
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	Coarse stock removal	ALU	600–1,100 m/min
				HICOAT HC-NFE	
			Fine stock removal	ALU	900–1,100 m/min
				HICOAT HC-NFE	
		Brass, copper, zinc	Coarse stock removal	ALU	600–1,100 m/min
				HICOAT HC-NFE	
				NON-FERROUS	450–600 m/min
			Fine stock removal	ALU	900–1,100 m/min
				HICOAT HC-NFE	
	Hard non-ferrous metals	Hard aluminium alloys (high Si content)	Coarse stock removal	ALU	600–1,100 m/min
				HICOAT HC-NFE	
			Fine stock removal	ALU	900–1,100 m/min
				HICOAT HC-NFE	
		Bronze	Coarse stock removal	ALU	600–900 m/min
				HICOAT HC-NFE	
				NON-FERROUS	
			Fine stock removal	ALU	600–1,100 m/min
				HICOAT HC-NFE	
Plastics, other materials	Thermoplastics, fibre-reinforced plastics (GRP/CRP)		Coarse stock removal	NON-FERROUS	600–1,100 m/min
				ALU	600–1,100 m/min
				HICOAT HC-NFE	
			Fine stock removal	ALU	600–1,100 m/min
				HICOAT HC-NFE	

Example:
TC burr,
ALU cut,
burr dia. of 12 mm.
Coarse stock removal on hard non-ferrous metals, e.g. bronze.
Cutting speed: 600–900 m/min
Rotational speed range:
16,000–24,000 RPM

❺ Burr dia. [mm]	❻ Cutting speeds [m/min]			
	450	600	900	1,100
	Rotational speeds [RPM]			
3	48,000	64,000	95,000	117,000
6	24,000	32,000	48,000	59,000
8	18,000	24,000	36,000	44,000
10	14,000	19,000	29,000	35,000
12	12,000	16,000	24,000	30,000
16	9,000	12,000	18,000	22,000

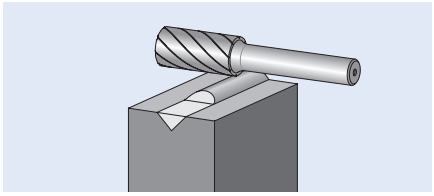
TC burrs for high-performance applications

ALU and NON-FERROUS cuts for aluminium/non-ferrous metals

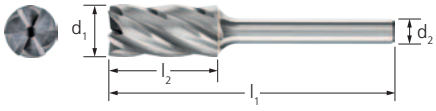


Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032.

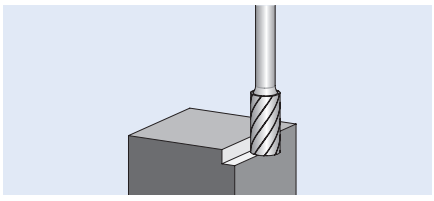


d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut NON-FERROUS EAN 4007220		Description
Shank dia. 6 mm						
6	16	6	55	221044	1	ZYA 0616/6 NON-FERROUS
12	25	6	65	533314	1	ZYA 1225/6 NON-FERROUS
Shank dia. 8 mm						
12	25	8	65	221051	1	ZYA 1225/8 NON-FERROUS



Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.



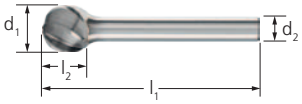
Ordering notes:

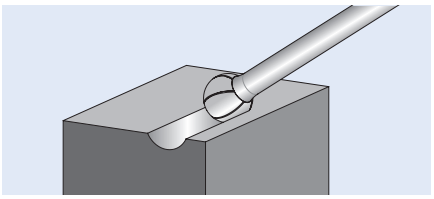
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut ALU HC-NFE		Description
				EAN 4007220			
Shank dia. 3 mm							
3	13	3	43	803653	-	1	ZYAS 0313/3 ...
6	13	3	43	803660	-	1	ZYAS 0613/3 ...
Shank dia. 6 mm							
6	16	6	55	246986	-	1	ZYAS 0616/6 ...
8	20	6	60	952955	-	1	ZYAS 0820/6 ...
10	20	6	60	533321	-	1	ZYAS 1020/6 ...
12	25	6	65	533345	804117	1	ZYAS 1225/6 ...
16	25	6	65	803974	-	1	ZYAS 1625/6 ...
Shank dia. 8 mm							
12	25	8	65	246979	-	1	ZYAS 1225/8 ...

Ball shape KUD

Ball-shaped burr according to DIN 8032.



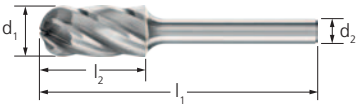


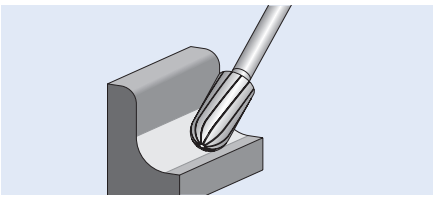
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut ALU HC-NFE	Cut NON-FERROUS		Description
				EAN 4007220				
Shank dia. 3 mm								
3	2	3	33	803714	-	-	1	KUD 0302/3 ...
6	5	3	35	803721	-	-	1	KUD 0605/3 ...
Shank dia. 6 mm								
6	5	6	45	869123	-	-	1	KUD 0605/6 ...
8	7	6	47	869130	-	221082	1	KUD 0807/6 ...
10	9	6	49	952962	-	-	1	KUD 1009/6 ...
12	10	6	51	533147	804155	533154	1	KUD 1210/6 ...
16	14	6	54	803998	-	-	1	KUD 1614/6 ...

Cylindrical shape with radius end WRC

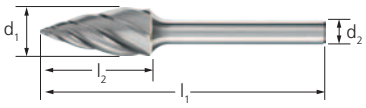
Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.





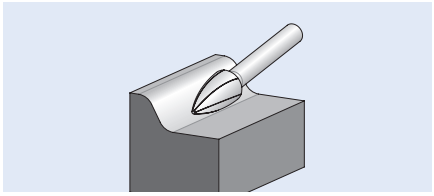
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut ALU HC-NFE	Cut NON-FERROUS		Description
				EAN 4007220				
Shank dia. 3 mm								
3	13	3	43	803691	-	-	1	WRC 0313/3 ...
6	13	3	43	803707	-	-	1	WRC 0613/3 ...
Shank dia. 6 mm								
6	16	6	55	247006	-	221068	1	WRC 0616/6 ...
8	20	6	60	952979	-	-	1	WRC 0820/6 ...
10	20	6	60	952986	-	-	1	WRC 1020/6 ...
12	25	6	65	533260	804131	533284	1	WRC 1225/6 ...
16	25	6	65	803981	-	-	1	WRC 1625/6 ...
Shank dia. 8 mm								
12	25	8	65	247013	-	-	1	WRC 1225/8 ...

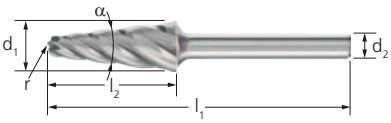


Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032, flattened tip.

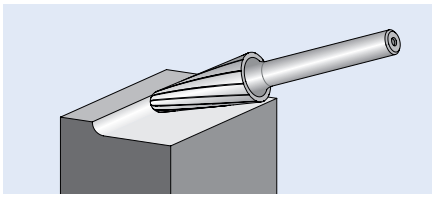


d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU EAN 4007220		Description
Shank dia. 3 mm						
3	7	3	37	003350	1	SPG 0307/3 ALU
	13	3	43	003435	1	SPG 0313/3 ALU
6	13	3	43	003442	1	SPG 0613/3 ALU
Shank dia. 6 mm						
6	18	6	55	003503	1	SPG 0618/6 ALU
8	20	6	60	003534	1	SPG 0820/6 ALU
10	20	6	60	003558	1	SPG 1020/6 ALU
12	25	6	65	003596	1	SPG 1225/6 ALU



Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.

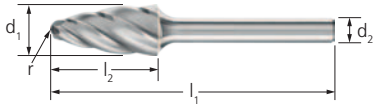


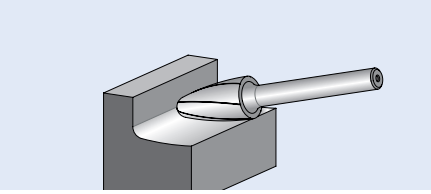
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut ALU	ALU HC-NFE	NON-FERROUS		Description
						EAN 4007220				
Shank dia. 6 mm										
8	20	6	60	16°	1.25	953013	-	-	1	KEL 0820/6 ...
10	20	6	60	14°	2.9	953020	-	221105	1	KEL 1020/6 ...
12	30	6	70	14°	2.6	533109	533093	533116	1	KEL 1230/6 ...
16	30	6	70	14°	4.8	804018	-	-	1	KEL 1630/6 ...
Shank dia. 8 mm										
12	30	8	70	14°	2.6	247037	-	-	1	KEL 1230/8 ...
16	30	8	70	14°	4.8	-	-	221129	1	KEL 1630/8 ...

Tree shape with radius end RBF

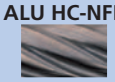
Tree-shaped burr with radius end according to DIN 8032.





Ordering notes:

- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut			Description
					ALU	ALU HC-NFE 		
					EAN 4007220			
Shank dia. 3 mm								
3	13	3	43	0.75	803677	-	1	RBF 0313/3 ...
6	13	3	43	1.5	803684	-	1	RBF 0613/3 ...
Shank dia. 6 mm								
6	18	6	55	1.5	328071	-	1	RBF 0618/6 ...
8	20	6	60	1.2	952993	-	1	RBF 0820/6 ...
10	20	6	60	2.5	953006	-	1	RBF 1020/6 ...
12	25	6	65	2.5	533208	533192	1	RBF 1225/6 ...
16	30	6	70	3.6	804001	-	1	RBF 1630/6 ...
Shank dia. 8 mm								
12	25	8	65	2.5	247020	-	1	RBF 1225/8 ...

TC burrs for high-performance applications
ALU and NON-FERROUS cuts for aluminium/non-ferrous metals

Set 1603 ALU

Set 1603 ALU contains ten small tungsten carbide burrs for processing aluminium in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.

Contents:
10 tungsten carbide burrs,
shank diameter of 3 mm, ALU cut
1 piece each:

ZYAS 0313/3 ALU	WRC 0313/3 ALU	SPG 0313/3 ALU
ZYAS 0613/3 ALU	WRC 0613/3 ALU	SPG 0613/3 ALU
KUD 0302/3 ALU	RBF 0313/3 ALU	
KUD 0605/3 ALU	RBF 0613/3 ALU	

Cut ALU EAN 4007220		Description
Shank dia. 3 mm		
004401	1	1603 ALU

Set 1612 ALU

Set 1612 ALU contains five tungsten carbide burrs for processing aluminium in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.
Five further slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm, ALU cut
1 piece each:

ZYAS 1225/6 ALU	RBF 1225/6 ALU
KUD 1210/6 ALU	KEL 1230/6 ALU
WRC 1225/6 ALU	

Cut ALU EAN 4007220		Description
Shank dia. 6 mm		
068823	1	1612 ALU

TC burrs for high-performance applications

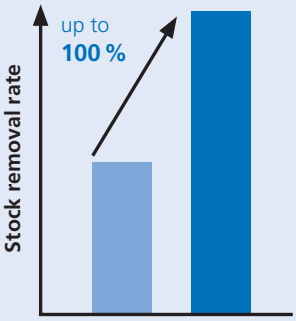
CAST cut for cast iron

With the CAST cut, PFERD has developed innovative burrs especially for work on cast iron. They are characterized by an extremely high stock removal rate on cast iron and impress through smooth milling with significantly reduced vibration and less noise.

Advantages:

- Up to 100 % higher stock removal rate when used on cast iron due to the innovative tooth geometry, when compared with conventional cross-cut burrs.
- Significantly increased aggressiveness, large chips and very good chip removal.
- Comfortable working with reduced vibration and less noise.

Performance values for applications on cast iron



- Conventional burrs with cross cut
- Tungsten carbide burrs, CAST cut

Materials that can be worked:

- Grey cast iron
- Nodular cast iron
- Annealed cast iron

Applications:

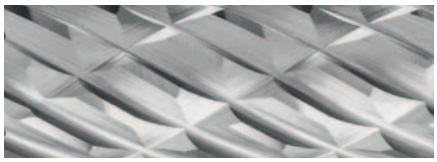
- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives: from 300 watts.
- Please observe the rotational speed recommendations.

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools



Safety note:

- The very high stock removal rate can cause discolouration on the shank. This does not constitute a safety risk.

PFERDVALUE:

PFERDERGONOMICS recommends burrs with CAST cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.

Vibration Filter | Noise Filter | Haptic Filter

PFERDEFFICIENCY recommends burrs with CAST cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

Energy Saving | Waste Saving | Time Saving | Resource Saving

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

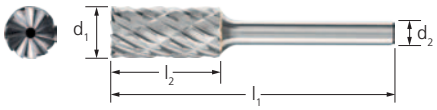
❶ Refer to the table for the cutting speed.
❷ Select the required burr diameter.
❸ The cutting speed range and the burr diameter determine the recommended rotational speed range.

Material group			Application	Cut	❶ Cutting speed
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal	CAST	450–750 m/min

Example:
TC burr,
CAST cut,
burr dia. of 12 mm.
Coarse stock removal on cast iron.
Cutting speed: 450–750 m/min
Rotational speed range:
12,000–20,000 RPM

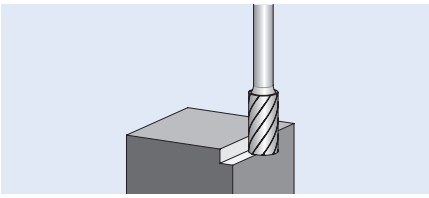
❷ Burr dia. [mm]	❸ Cutting speeds [m/min]	
	450	750
	Rotational speeds [RPM]	
6	24,000	40,000
10	14,000	24,000
12	12,000	20,000

TC burrs for high-performance applications
CAST cut for cast iron



Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.



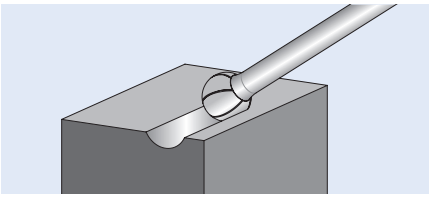
PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	16	6	55	952658	24,000–40,000	1	ZYAS 0616/6 CAST
10	20	6	60	952665	14,000–24,000	1	ZYAS 1020/6 CAST
12	25	6	65	952672	12,000–20,000	1	ZYAS 1225/6 CAST
Shank dia. 8 mm							
12	25	8	65	067925	12,000–20,000	1	ZYAS 1225/8 CAST

Ball shape KUD

Ball-shaped burr according to DIN 8032.



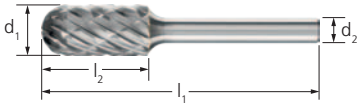
PFERDVALUE:

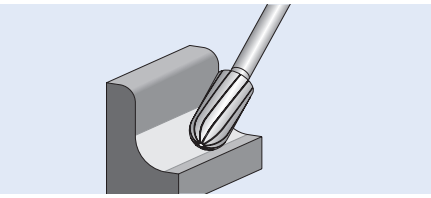
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm							
10	9	6	49	952504	14,000–24,000	1	KUD 1009/6 CAST
12	10	6	51	952511	12,000–20,000	1	KUD 1210/6 CAST
Shank dia. 8 mm							
12	10	8	51	068038	12,000–20,000	1	KUD 1210/8 CAST

Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.





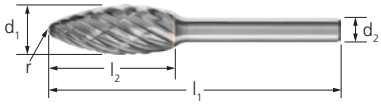
PFERDVALUE:

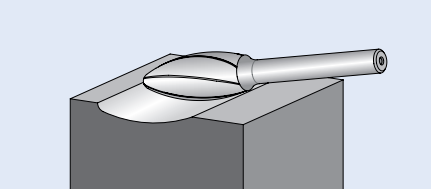
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	16	6	55	952610	24,000–40,000	1	WRC 0616/6 CAST
10	20	6	60	952627	14,000–24,000	1	WRC 1020/6 CAST
12	25	6	65	952634	12,000–20,000	1	WRC 1225/6 CAST
Shank dia. 8 mm							
12	25	8	65	067932	12,000–20,000	1	WRC 1225/8 CAST

Flame shape B

Flame-shaped burr according to ISO 7755/8.



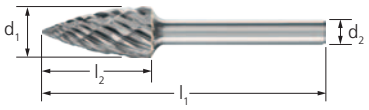


PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

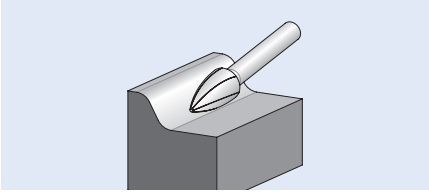
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm								
12	30	6	70	2.1	952450	12,000–20,000	1	B 1230/6 CAST
Shank dia. 8 mm								
12	30	8	70	2.1	068021	12,000–20,000	1	B 1230/8 CAST

TC burrs for high-performance applications
CAST cut for cast iron



Pointed tree shape SPG

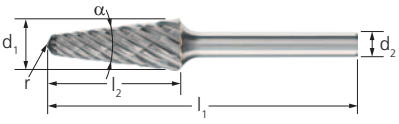
Pointed tree-shaped burr according to DIN 8032, flattened tip.



PFERDVALUE:

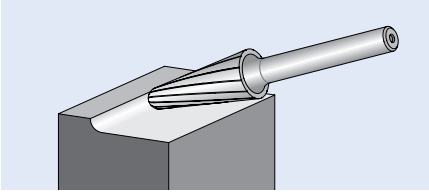
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm							
6	18	6	55	952580	24,000–40,000	1	SPG 0618/6 CAST
10	20	6	60	952597	14,000–24,000	1	SPG 1020/6 CAST
12	25	6	70	952603	12,000–20,000	1	SPG 1225/6 CAST
Shank dia. 8 mm							
12	25	8	70	067956	12,000–20,000	1	SPG 1225/8 CAST



Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.



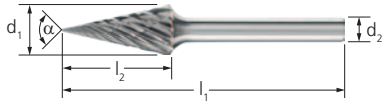
PFERDVALUE:

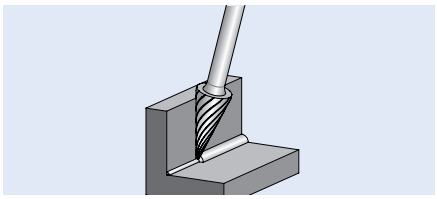
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm									
12	30	6	70	14°	2.6	952474	12,000–20,000	1	KEL 1230/6 CAST
Shank dia. 8 mm									
12	30	8	70	14°	2.6	068014	12,000–20,000	1	KEL 1230/8 CAST

Conical pointed shape SKM

Conical pointed burr according to DIN 8032, flattened tip.





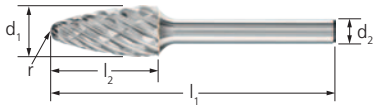
PFERDVALUE:

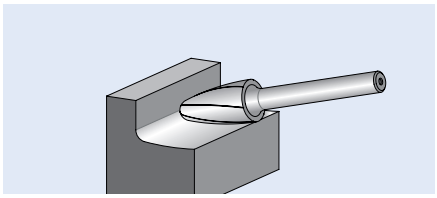
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm								
12	25	6	65	26°	952481	12,000–20,000	1	SKM 1225/6 CAST

Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.





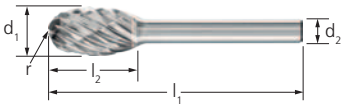
PFERDVALUE:

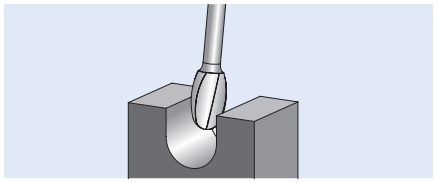
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm								
6	18	6	55	1.5	952528	24,000–40,000	1	RBF 0618/6 CAST
10	20	6	60	2.5	952559	14,000–24,000	1	RBF 1020/6 CAST
12	25	6	65	2.5	952566	12,000–20,000	1	RBF 1225/6 CAST
Shank dia. 8 mm								
12	25	8	65	2.5	067949	12,000–20,000	1	RBF 1225/8 CAST

Oval shape TRE

Oval burr according to DIN 8032.





PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut CAST EAN 4007220	RPM		Description
Shank dia. 6 mm								
12	20	6	60	5.0	952467	12,000–20,000	1	TRE 1220/6 CAST

TC burrs for high-performance applications
TITANIUM cut for titanium

The TITANIUM cut has been especially developed for work on hard titanium materials (tensile strength > 500 N/mm²). It is characterized by an extremely high stock removal rate on this material group, which has very challenging stock removal properties. Tungsten carbide burrs with the TITANIUM cut impress with their smooth milling with considerably reduced vibration and less noise.

Advantages:

- Outstanding stock removal rate and tool life due to the innovative tooth geometry.
- Significantly increased aggressiveness, large chips and very good chip removal.
- Comfortable working with reduced vibration and less noise.

Materials that can be worked:

- Titanium
- Hard titanium alloys

Applications:

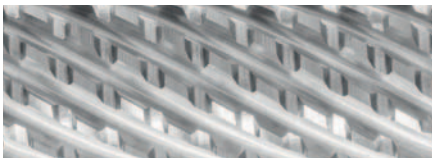
- Milling out
- Levelling
- Deburring
- Cutting out holes
- Surface work
- Work on weld seams

Recommendations for use:

- Determine the rotational speed in each case depending on the titanium alloy you need to machine.
- Reduce the rotational speed if excessive flying sparks occur. Depending on the titanium alloy you are machining, flying sparks may not be entirely avoidable.
- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds.
  Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

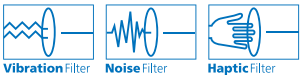


Safety note:

- The very high stock removal rate can cause discolouration on the shank. This does not constitute a safety risk.

PFERDVALUE:

PFERDERGONOMICS recommends burrs with TITANIUM cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.



PFERDEFFICIENCY recommends burrs with TITANIUM cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Refer to the table for the cutting speed.
❷ Select the required burr diameter.
❸ The cutting speed range and the burr diameter determine the recommended rotational speed range.

Material group			Application	Cut	❶ Cutting speed
Non-ferrous metals	Hard non-ferrous metals	Hard titanium alloys	Coarse stock removal	TITANIUM	250–450 m/min

Example:
TC burr,
TITANIUM cut,
burr dia. of 12 mm.
Coarse stock removal on hard titanium alloys.
Cutting speed: 250–450 m/min
Rotational speed range: 7,000–12,000 RPM

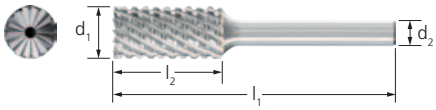
❷ Burr dia. [mm]	❸ Cutting speeds [m/min]	
	250	450
	Rotational speeds [RPM]	
3	27,000	48,000
4	20,000	36,000
5	16,000	29,000
6	13,000	24,000
12	7,000	12,000

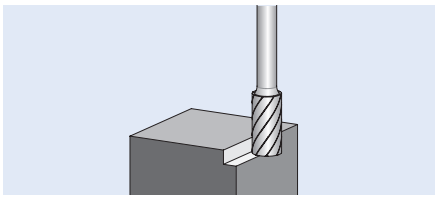
Note:

For soft titanium alloys (tensile strength < 500 N/mm²), we recommend tungsten carbide burrs with the INOX cut. The special tooth geometry on these burrs prevents the flutes becoming clogged, particularly for soft, lubricating materials (see page 44).

Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with cut on circumference and end.





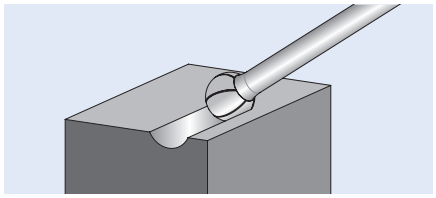
PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TITANIUM EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	13	3	43	034217	27,000–48,000	1	ZYAS 0313/3 TITANIUM
6	13	3	43	034224	13,000–24,000	1	ZYAS 0613/3 TITANIUM
Shank dia. 6 mm							
6	16	6	55	034248	13,000–24,000	1	ZYAS 0616/6 TITANIUM
12	25	6	65	034255	7,000–12,000	1	ZYAS 1225/6 TITANIUM

Ball shape KUD

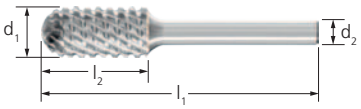
Ball-shaped burr according to DIN 8032.



PFERDVALUE:

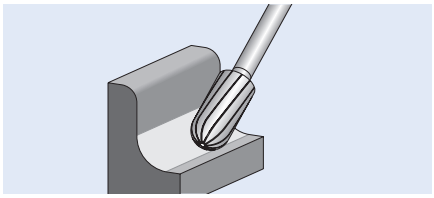
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TITANIUM EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	2	3	33	034149	27,000–48,000	1	KUD 0302/3 TITANIUM
4	3	3	34	034163	20,000–36,000	1	KUD 0403/3 TITANIUM
5	4	3	35	034170	16,000–29,000	1	KUD 0504/3 TITANIUM
6	5	3	35	034187	13,000–24,000	1	KUD 0605/3 TITANIUM
Shank dia. 6 mm							
6	5	6	45	034194	13,000–24,000	1	KUD 0605/6 TITANIUM
12	10	6	51	034200	7,000–12,000	1	KUD 1210/6 TITANIUM



Cylindrical shape with radius end WRC

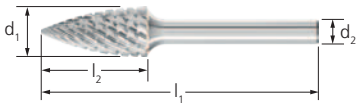
Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.



PFERDVALUE:

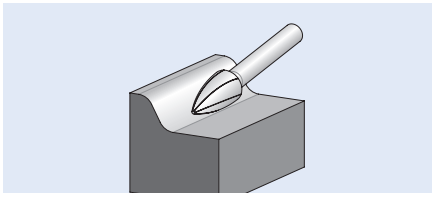
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TITANIUM EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	13	3	43	034309	27,000–48,000	1	WRC 0313/3 TITANIUM
6	13	3	43	034316	13,000–24,000	1	WRC 0613/3 TITANIUM
Shank dia. 6 mm							
6	16	6	55	034330	13,000–24,000	1	WRC 0616/6 TITANIUM
12	25	6	65	034347	7,000–12,000	1	WRC 1225/6 TITANIUM



Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032, flattened tip.



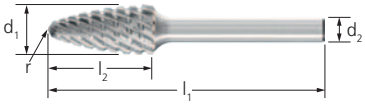
PFERDVALUE:

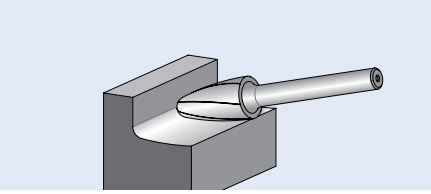
Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TITANIUM EAN 4007220	RPM		Description
Shank dia. 3 mm							
3	7	3	37	034323	27,000–48,000	1	SPG 0307/3 TITANIUM
	13	3	43	034392	27,000–48,000	1	SPG 0313/3 TITANIUM
6	13	3	43	034408	13,000–24,000	1	SPG 0613/3 TITANIUM
Shank dia. 6 mm							
6	18	6	55	034415	13,000–24,000	1	SPG 0618/6 TITANIUM
12	25	6	65	034422	7,000–12,000	1	SPG 1225/6 TITANIUM

Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.





PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut TITANIUM EAN 4007220	RPM		Description
Shank dia. 3 mm								
3	13	3	43	0.75	034354	27,000–48,000	1	RBF 0313/3 TITANIUM
6	13	3	43	1.5	034361	13,000–24,000	1	RBF 0613/3 TITANIUM
Shank dia. 6 mm								
6	18	6	55	1.5	034378	13,000–24,000	1	RBF 1225/6 TITANIUM
12	25	6	65	2.5	034385	7,000–12,000	1	RBF 1225/6 TITANIUM

TC burrs for high-performance applications

PLAST, FVK and FVKS cuts for GRP/CRP

Tungsten carbide burrs with the PLAST, FVK and FVKS cuts are suitable for trimming and contour milling on a wide range of fibre-reinforced plastics (GRP/CRP).

Burrs with a drill cut (BS) or with a centre drill (ZBS) allow combined drilling and milling work. Burrs with an end cut (two teeth, STS) enable holes to be drilled with minimal burr formation, whilst the version with a flat end cut (two teeth, FSTS) is used to mill grooves and pockets. The STS and FSTS versions are suitable only for machine and robot applications. The special tooth geometry allows high feed rates due to the low resistance. In addition, these burrs are characterized by smooth milling.

Recommendations for use:

- The version with a drill cut (BS) is particularly suitable for machine and robot applications, while the version with a centre drill (ZBS) is used for manual applications. It allows secure drilling on almost all surface conditions.
- The versions with an end cut (two teeth, STS) and flat end cut (two teeth, FSTS) are suitable only for machine and robot applications.
- Select a burr diameter greater than the thickness of the material to be machined, to avoid impacts and chattering with the risk of damaging or breaking the tool.
- Increase the rotational speed if the tool tends to chatter.
- If necessary, reduce the rotational speed and contact pressure if melting occurs.
- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

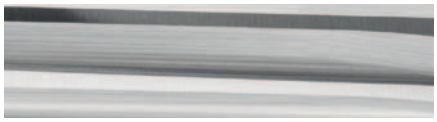
Applications:

- Trimming
- Contour milling
- Cutting out holes
- Deburring
- Milling grooves and pockets (with FSTS)
- Drilling blind holes (with FSTS)
- Drilling with minimal burr formation (with STS)
- Milling out
- Cutting out holes

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

PLAST cut



Tungsten carbide burrs with the PLAST cut are particularly suitable for use on less hard glass and carbon-fibre-reinforced duroplastics (GRP and CRP with ≤ 40 % fibre content) and fibre-reinforced thermoplastics. The cut (similar to PCD milling) minimizes delamination and fraying.

Advantages:

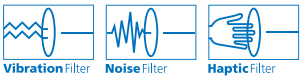
- Particularly suitable for GRP and CRP with ≤ 40 % fibre content.
- Minimizes delamination and fraying due to the special cut that is similar to PCD mills.
- Particularly suitable for use on machines and on robots.
- Very low cutting force.
- High feed rates.

Materials that can be worked:

- Plastics
- Fibre-reinforced plastics (GRP/CRP) with a fibre content ≤ 40 %
- Thermoplastics

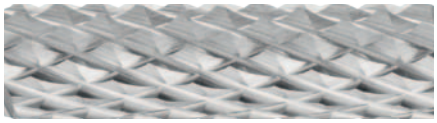
PFERDVALUE:

PFERDERGONOMICS recommends burrs with PLAST cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.



PFERDEFFICIENCY recommends burrs with PLAST cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

FVK cut



FVKS cut

Tungsten carbide burrs with the FVK and FVKS cuts are suitable for universal use on hard glass and carbon-fibre-reinforced duroplastics. Due to its high concentricity, the FVK cut is suitable for tool machines and manual applications. It is characterized by smooth milling and produces a smooth cut edge. The FVKS cut is suitable for use on machines and robots with high feed rates.

Advantages:

- Particularly suitable for GRP and CRP, also with > 40 % fibre content.
- The FVKS cut produces smooth edges and is characterized by smooth milling.

Materials that can be worked:

- Plastics
- Fibre-reinforced plastics (GRP/CRP) with a fibre content > 40 %

Recommended rotational speed range [RPM]

To determine the recommended rotational speed range [RPM], please proceed as follows:

❶ Refer to the table for the cutting speed.
❷ Select the required burr diameter.
❸ The cutting speed range and the burr diameter determine the recommended rotational speed range.

Material group		Application	Cut	❶ Cutting speed
Plastics, other materials	Thermoplastics, fibre-reinforced plastics (GRP/CRP) with a fibre content ≤ 40 %	Trimming, contour milling, cutting out holes, deburring	PLAST	450–900 m/min
	Fibre-reinforced plastics (GRP/CRP) with a fibre content > 40 %		FVK FVKS	

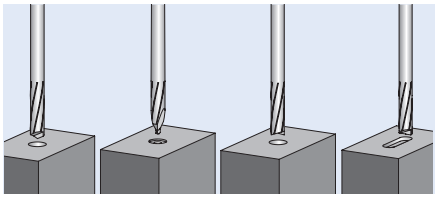
Example:
TC burr,
PLAST cut,
burr dia. of 8 mm.
Trimming plastics.
Cutting speed: 450–900 m/min
Rotational speed range:
18,000–36,000 RPM

❷ Burr dia. [mm]	❸ Cutting speeds [m/min]	
	450	900
	Rotational speeds [RPM]	
6	24,000	48,000
8	18,000	36,000

More PFERD tools and useful information on working with plastic can be found in our PRAXIS brochure "PFERD tools for use on plastics". Please contact us for further details.

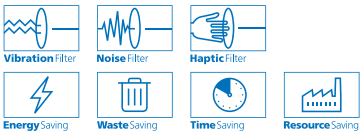
Cylindrical shape ZYA

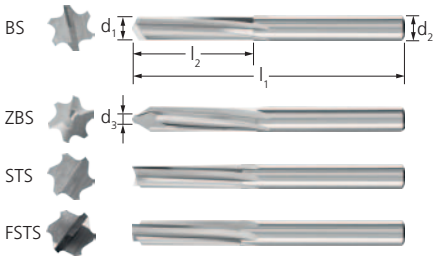
Cylindrical burr.



Ordering notes:
■ Please complete the description with the desired cut.

PFERDVALUE:
PLAST cut





d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Center drill d_3 [mm]	Cut: PLAST	Cut: FVK	Cut: FVKS	RPM		Description
					EAN 4007220					
Shank dia. of 6 mm with drill cut (BS)										
6	25	6	65	-	900413	050217	808900	24,000–48,000	1	ZYA 0625/6 ... BS
Shank dia. of 8 mm with drill cut (BS)										
8	25	8	65	-	900468	050231	808917	18,000–36,000	1	ZYA 0825/8 ... BS
Shank dia. of 6 mm with centre drill (ZBS)										
6	25	6	65	2.5	900451	869048	869055	24,000–48,000	1	ZYA 0625/6 ... ZBS
Shank dia. 6 mm with end cut (STS)										
6	25	6	65	-	003107	-	-	24,000–48,000	1	ZYA 0625/6 ... STS
Shank dia. 8 mm with end cut (STS)										
8	25	8	65	-	003121	-	-	18,000–36,000	1	ZYA 0825/8 ... STS
Shank dia. 6 mm with flat end cut (FSTS)										
6	25	6	65	-	003138	-	-	24,000–48,000	1	ZYA 0625/6 ... FSTS
Shank dia. 8 mm with flat end cut (FSTS)										
8	25	8	65	-	003152	-	-	18,000–36,000	1	ZYA 0825/8 ... FSTS

TC burrs for high-performance applications

TOUGH and TOUGH-S cuts for tough applications

The TOUGH and TOUGH-S cuts have been specially designed for tough operating conditions in dockyards, foundries and steel construction. They are also ideal for use in all manufacturing sectors where, due to the difficult production environment, tooth breakages or other damage to conventional burrs is a frequent occurrence.

Advantages:

- Innovative, special cuts providing exceptional impact resistance.
- Minimized tooth chipping/breakage, splintering and burr failures due to very robust, high-performance cuts.
- Can also be used at low rotational speeds.
- Due to their extreme impact resistance, they can perfectly be used as long-shank variants.

Applications:

- High-impact applications when using shank extensions
- Applications with a high angle of surface contact
- Milling of narrow contours
- Applications where high rotational speeds are not available

Materials that can be worked:

- Cast iron
- Steel
- Cast steel
- The TOUGH and TOUGH-S cuts can be used on materials up to 54 HRC. For harder materials, it is recommended to perform trials beforehand.

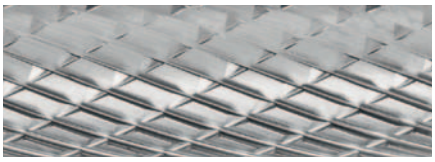
Recommendations for use:

- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

Matching tool drives:

- Flexible shaft drive
- Straight grinder

TOUGH cut



Tungsten carbide burrs with the TOUGH cut are particularly aggressive and are characterized by high stock removal.

TOUGH-S cut

Tungsten carbide burrs with the TOUGH-S cut are characterized by smooth milling and high stock removal.

Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Select the cut.
❸ Establish the cutting speed range.

To determine the recommended rotational speed range [RPM], please proceed as follows:

❹ Select the required burr diameter.
❺ The cutting speed range and the burr diameter determine the recommended rotational speed range.

Safety note:

Please observe the reduced rotational speeds for burrs with a long shank. They can be found on page 11.

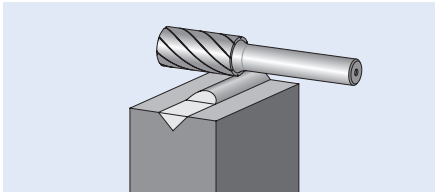
❶ Material group			Application	❷ Cut	❸ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal with impact load	TOUGH	250–600 m/min
				TOUGH-S	
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel		TOUGH	250–350 m/min
				TOUGH-S	
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/ nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal with impact load	TOUGH	250–600 m/min
				TOUGH-S	

Example:
TC burr,
TOUGH cut,
burr dia. of 12 mm.
Coarse stock removal with impact load on steels up to 1,200 N/mm².
Cutting speed: 250–600 m/min
Rotational speed range: 7,000–16,000 RPM

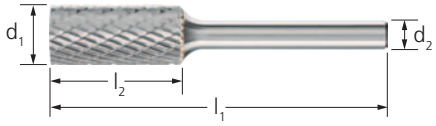
❹ Burr dia. [mm]	❺ Cutting speeds [m/min]		
	250	350	600
	Rotational speeds [RPM]		
8	10,000	14,000	24,000
10	8,000	11,000	19,000
12	7,000	9,000	16,000
16	5,000	7,000	12,000

Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032.



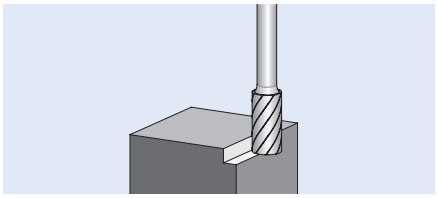
Ordering notes:
- Please complete the description with the desired cut.

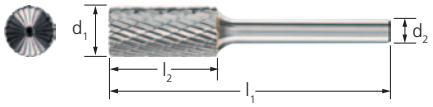


d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TOUGH	Cut TOUGH-S		Description
				EAN 4007220			
Shank dia. 6 mm							
8	20	6	60	895504	-	1	ZYA 0820/6 ...
10	20	6	60	895658	-	1	ZYA 1020/6 ...
12	25	6	65	895665	895672	1	ZYA 1225/6 ...

Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.

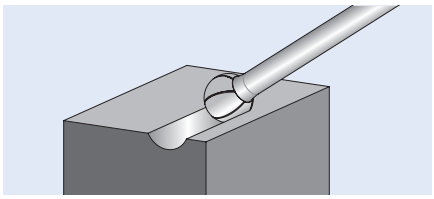




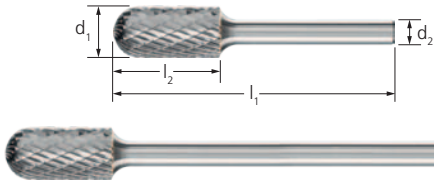
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TOUGH		Description
				EAN 4007220		
Shank dia. 6 mm						
8	20	6	60	769997	1	ZYAS 0820/6 TOUGH
10	20	6	60	770023	1	ZYAS 1020/6 TOUGH
12	25	6	65	869109	1	ZYAS 1225/6 TOUGH
Shank dia. 8 mm						
12	25	8	65	770054	1	ZYAS 1225/8 TOUGH

Ball shape KUD

Ball-shaped burr according to DIN 8032.



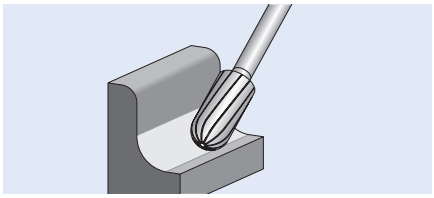
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TOUGH EAN 4007220		Description
Shank dia. 6 mm						
8	7	6	47	955383	1	KUD 0807/6 TOUGH
12	10	6	51	770160	1	KUD 1210/6 TOUGH



Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.

SL = shank length (long steel shank)



Ordering notes:

- Please complete the description with the desired cut.

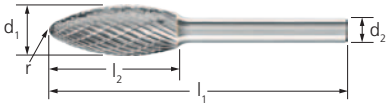
Safety notes:

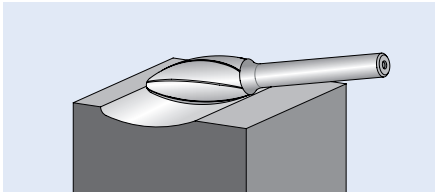
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TOUGH	Cut TOUGH-S		Description
				EAN 4007220			
Shank dia. 6 mm							
8	20	6	60	770108	-	1	WRC 0820/6 ...
10	20	6	60	770115	-	1	WRC 1020/6 ...
12	25	6	65	770122	770139	1	WRC 1225/6 ...
Long shank dia. of 6 mm, SL 150 mm							
12	25	6	175	091043	-	1	WRC 1225/6 ... SL 150
Shank dia. 8 mm							
12	25	8	65	769881	-	1	WRC 1225/8 ...

Flame shape B

Flame-shaped burr according to ISO 7755/8.



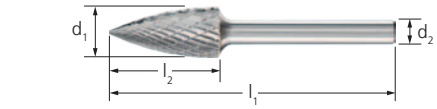


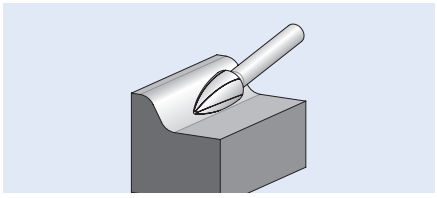
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut TOUGH EAN 4007220		Description
Shank dia. 6 mm							
8	20	6	60	1.5	770061	1	B 0820/6 TOUGH
12	30	6	70	2.1	770085	1	B 1230/6 TOUGH
Shank dia. 8 mm							
12	30	8	70	2.1	770092	1	B 1230/8 TOUGH

Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032, flattened tip.

SL = shank length (long steel shank)





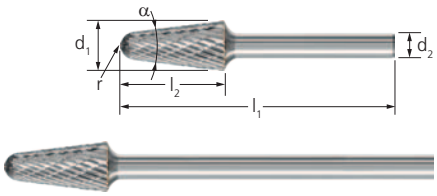
Ordering notes:

- Please complete the description with the desired cut.

Safety notes:

Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

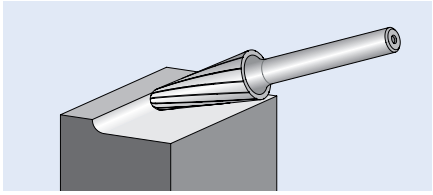
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut TOUGH	Cut TOUGH-S		Description
				EAN 4007220			
Shank dia. 6 mm							
10	20	6	60	770252	770269	1	SPG 1020/6 ...
12	25	6	65	770276	-	1	SPG 1225/6 ...
Long shank dia. of 6 mm, SL 150 mm							
12	25	6	175	090930	-	1	SPG 1225/6 ... SL 150
Shank dia. 8 mm							
12	25	8	65	770283	-	1	SPG 1225/8 ...



Conical shape with radius end KEL

Conical burr with radius end according to DIN 8032.

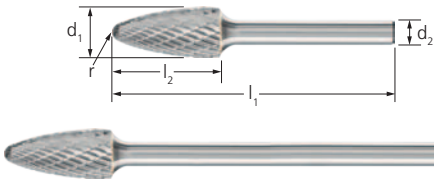
SL = shank length (long steel shank)



Safety notes:

Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

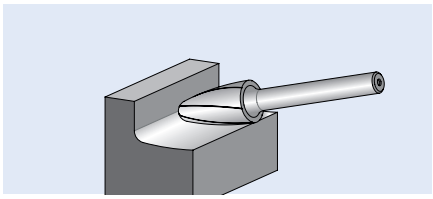
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut TOUGH EAN 4007220		Description
Shank dia. 6 mm								
12	25	6	65	14°	3.3	770320	1	KEL 1225/6 TOUGH
Long shank dia. of 6 mm, SL 150 mm								
12	25	6	175	14°	3.3	091166	1	KEL 1225/6 TOUGH SL 150
Shank dia. 8 mm								
12	25	8	65	14°	3.3	770337	1	KEL 1225/8 TOUGH



Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.

SL = shank length (long steel shank)



Ordering notes:

- Please complete the description with the desired cut.

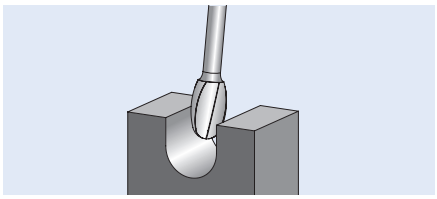
Safety notes:

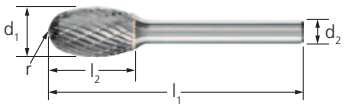
Please observe the reduced rotational speeds for long-shank burrs. They can be found on page 11.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut TOUGH	Cut TOUGH-S		Description
					EAN 4007220			
Shank dia. 6 mm								
8	20	6	60	1.2	770191	-	1	RBF 0820/6 ...
10	20	6	60	2.5	770207	-	1	RBF 1020/6 ...
12	25	6	65	2.5	770214	770238	1	RBF 1225/6 ...
16	25	6	65	4.9	869116	-	1	RBF 1625/6 ...
Long shank dia. of 6 mm, SL 150 mm								
12	25	6	-	2.5	090947	-	1	RBF 1225/6 ... SL 150
Shank dia. 8 mm								
12	25	8	65	2.5	770221	770245	1	RBF 1225/8 ...

Oval shape TRE

Oval burr according to DIN 8032.





d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut TOUGH EAN 4007220		Description
Shank dia. 6 mm							
10	16	6	56	4.0	770344	1	TRE 1016/6 TOUGH
12	20	6	60	5.0	770351	1	TRE 1220/6 TOUGH

Set 1712 TOUGH

Set 1712 TOUGH contains five tungsten carbide burrs for tough applications in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.
Five further unused slots are available for other burrs.

Contents:
5 tungsten carbide burrs,
shank diameter of 6 mm, TOUGH cut
1 piece each:
WRC 1225/6 TOUGH
SPG 1225/6 TOUGH
RBF 1225/6 TOUGH
KEL 1225/6 TOUGH
TRE 1220/6 TOUGH

Cut TOUGH EAN 4007220		Description
Shank dia. 6 mm		
955635	1	1712 TOUGH

TC burrs for high-performance applications
MICRO cut for finishing work

Tungsten carbide burrs with the MICRO cut are specifically designed for finishing and are used in areas in which mounted grinding points are usually used. They offer a higher stock removal rate and produce a high surface quality, particularly compared with conventionally milled surfaces. They also operate with low vibration and little noise. They maintain their geometry over their entire tool life, and are well suited to manual and machine applications. Almost all materials up to a hardness of 68 HRC can be machined.

Advantages:

- High surface quality.
- Unlike with mounted grinding points, there is no change in geometry due to wear and tear.
- Work on almost all materials up to 68 HRC.

Applications:

- Finishing
- Very fine cleaning work
- Corrections in tool and mould construction
- Sharpening cutting tools

Materials that can be worked:

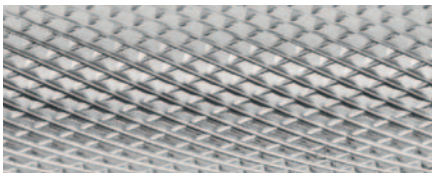
- Steel and cast steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron

Recommendations for use:

- If possible, use the tools on powerful drives with elastically mounted spindles to avoid vibration.
- For the cost-effective use of burrs, work with higher rotational/cutting speeds. Power recommendation for tool drives:
  - Shank diameter of 3 mm: 75 to 300 watts
  - Shank diameter of 6 mm: from 300 watts
- Please observe the rotational speed recommendations.

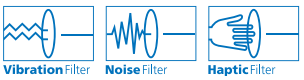
Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot applications
- Machine tools



PFERDVALUE:

PFERDERGONOMICS recommends burrs with MICRO cut as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.



PFERDEFFICIENCY recommends burrs with MICRO cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

The PFERD range includes numerous tools which are suitable for use in tool and mould construction. We have compiled these special solutions for you in our FOCUS brochure. Please contact us for further details.

Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Establish the cutting speed range.

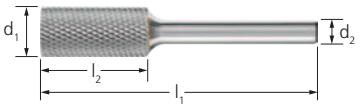
To determine the recommended rotational speed range [RPM], please proceed as follows:

❸ Select the required burr diameter.
❹ The cutting speed range and the burr diameter determine the recommended rotational speed range.

❶ Material group			Application	Cut	❷ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Fine stock removal	MICRO	600–750 m/min
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel			450–600 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Fine stock removal	MICRO	450–600 m/min
Non-ferrous metals	Hard non-ferrous metals	Bronze, titanium/titanium alloys, hard aluminium alloys (high Si content)	Fine stock removal	MICRO	450–600 m/min
	High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)			
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Fine stock removal	MICRO	600–750 m/min

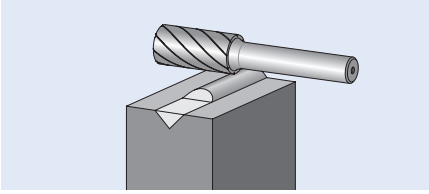
Example:
TC burr,
MICRO cut,
burr dia. of 10 mm.
Fine stock removal on steels up to 1,200 N/mm².
Cutting speed: 600–750 m/min
Rotational speed range: 19,000–24,000 RPM

❸ Burr dia. [mm]	❹ Cutting speeds [m/min]		
	450	600	750
	Rotational speeds [RPM]		
2	72,000	95,000	120,000
3	48,000	64,000	80,000
4	36,000	48,000	60,000
6	24,000	32,000	40,000
8	18,000	24,000	30,000
10	14,000	19,000	24,000
12	12,000	16,000	20,000



Cylindrical shape ZYA without end cut

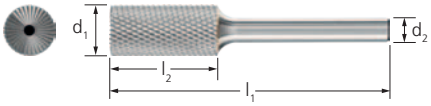
Cylindrical burr according to DIN 8032. Shape ZYAS with circumferential and end cut.



PFERDVALUE:

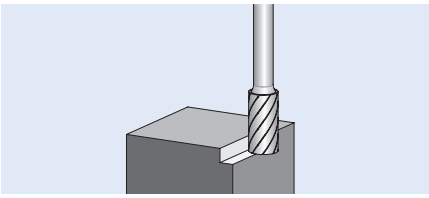
Vibration Filter · Noise Filter · Haptic Filter · Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut MICRO EAN 4007220		Description
Shank dia. 3 mm						
2	10	3	40	895511	1	ZYA 0210/3 MICRO
3	13	3	43	895535	1	ZYA 0313/3 MICRO
4	13	3	43	895542	1	ZYA 0413/3 MICRO
6	13	3	43	953068	1	ZYA 0613/3 MICRO
Shank dia. 6 mm						
6	16	6	55	895559	1	ZYA 0616/6 MICRO
8	20	6	60	895573	1	ZYA 0820/6 MICRO
10	20	6	60	895603	1	ZYA 1020/6 MICRO
12	25	6	65	953051	1	ZYA 1225/6 MICRO



Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut.



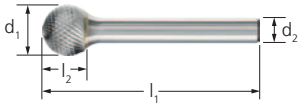
PFERDVALUE:

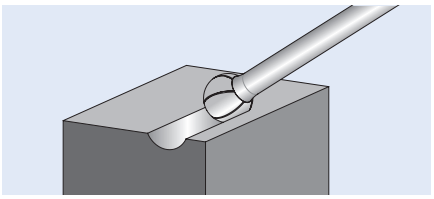
Vibration Filter · Noise Filter · Haptic Filter · Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut MICRO EAN 4007220		Description
Shank dia. 6 mm						
6	16	6	55	895566	1	ZYAS 0616/6 MICRO
8	20	6	60	895580	1	ZYAS 0820/6 MICRO
10	20	6	60	895610	1	ZYAS 1020/6 MICRO
12	25	6	65	953105	1	ZYAS 1225/6 MICRO

Ball shape KUD

Ball-shaped burr according to DIN 8032.





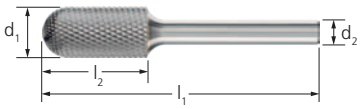
PFERDVALUE:

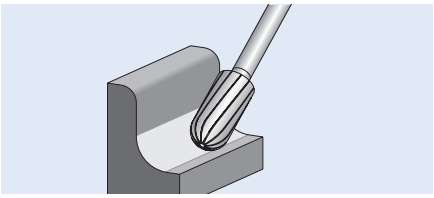
Vibration Filter · Noise Filter · Haptic Filter · Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut MICRO EAN 4007220		Description
Shank dia. 3 mm						
2	1.5	3	33	895399	1	KUD 021,5/3 MICRO
3	2	3	33	895405	1	KUD 0302/3 MICRO
4	3	3	34	895412	1	KUD 0403/3 MICRO
6	5	3	35	953129	1	KUD 0605/3 MICRO
Shank dia. 6 mm						
6	5	6	45	895436	1	KUD 0605/6 MICRO
8	7	6	47	895474	1	KUD 0807/6 MICRO
10	9	6	49	895481	1	KUD 1009/6 MICRO
12	10	6	51	953112	1	KUD 1210/6 MICRO

Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032. Combination of cylindrical and ball-shaped geometries.



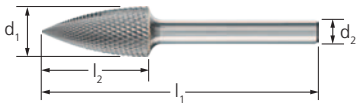


PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Time Saving

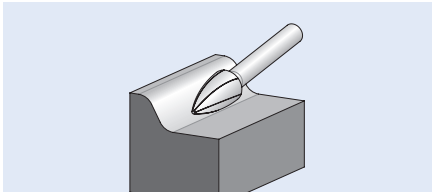
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut MICRO EAN 4007220		Description
Shank dia. 3 mm						
2	10	3	40	953167	1	WRC 0210/3 MICRO
3	13	3	43	869000	1	WRC 0313/3 MICRO
6	13	3	43	953150	1	WRC 0613/3 MICRO
Shank dia. 6 mm						
6	16	6	55	869017	1	WRC 0616/6 MICRO
8	20	6	60	869024	1	WRC 0820/6 MICRO
10	20	6	60	869031	1	WRC 1020/6 MICRO
12	25	6	65	953136	1	WRC 1225/6 MICRO

TC burrs for high-performance applications
MICRO cut for finishing work



Pointed tree shape SPG

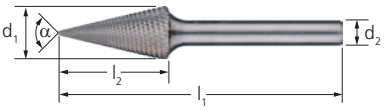
Pointed tree-shaped burr according to DIN 8032, flattened tip.



PFERDVALUE:

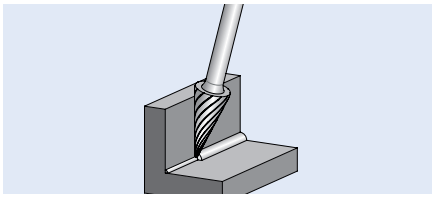
Vibration Filter | Noise Filter | Haptic Filter | Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut MICRO		Description
				EAN 4007220		
Shank dia. 3 mm						
3	7	3	37	003886	1	SPG 0307/3 MICRO
	13	3	43	003893	1	SPG 0313/3 MICRO
6	13	3	43	003909	1	SPG 0613/3 MICRO
Shank dia. 6 mm						
6	18	6	55	003916	1	SPG 0618/6 MICRO
8	20	6	60	003923	1	SPG 0820/6 MICRO
10	20	8	60	003930	1	SPG 1020/6 MICRO
12	25	6	65	003954	1	SPG 1225/6 MICRO



Conical pointed shape SKM

Conical pointed burr according to DIN 8032, flattened tip.



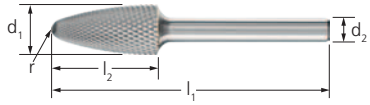
PFERDVALUE:

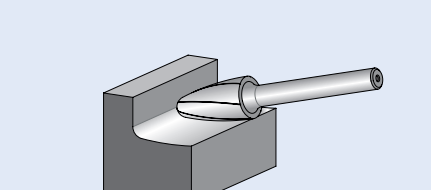
Vibration Filter | Noise Filter | Haptic Filter | Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut MICRO		Description
					EAN 4007220		
Shank dia. 3 mm							
3	7	3	37	21°	067833	1	SKM 0307/3 MICRO
	11	3	41	14°	067864	1	SKM 0311/3 MICRO
6	13	3	43	25°	067871	1	SKM 0613/3 MICRO
Shank dia. 6 mm							
6	18	6	55	18°	067888	1	SKM 0618/6 MICRO
8	20	6	60	22°	067895	1	SKM 0820/6 MICRO
10	20	6	60	28°	067901	1	SKM 1020/6 MICRO
12	25	6	65	26°	067918	1	SKM 1225/6 MICRO

Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032.





PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Time Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut MICRO EAN 4007220		Description
Shank dia. 3 mm							
3	7	3	37	0.75	835524	1	RBF 0307/3 MICRO
	13	3	43	0.75	955352	1	RBF 0313/3 MICRO
6	13	3	43	1.5	955338	1	RBF 0613/3 MICRO
Shank dia. 6 mm							
6	18	6	55	1.5	835494	1	RBF 0618/6 MICRO
8	20	6	60	1.2	835500	1	RBF 0820/6 MICRO
10	20	6	60	2.5	835517	1	RBF 1020/6 MICRO
12	25	6	65	2.5	953143	1	RBF 1225/6 MICRO

Set 1502 MICRO

Set 1502 MICRO contains ten tungsten carbide burrs for finishing in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.

Contents:
10 tungsten carbide burrs,
shank diameter of 3 mm, MICRO cut
1 piece each:

ZYA 0210/3 MICRO	WRC 0613/3 MICRO
ZYA 0313/3 MICRO	KUD 0302/3 MICRO
ZYA 0613/3 MICRO	KUD 0605/3 MICRO
WRC 0210/3 MICRO	RBF 0307/3 MICRO
WRC 0313/3 MICRO	RBF 0613/3 MICRO

PFERDVALUE:

Vibration Filter · Noise Filter · Haptic Filter · Time Saving

Cut MICRO EAN 4007220		Description
Shank dia. 3 mm		
896181	1	1502 MICRO

TC burrs for high-performance applications
TC burrs for work on edges

Tungsten carbide burrs for work on edges represent a separate PFERD product line. They are mainly used in steel and aluminium construction and have been specifically designed for chamfering, deburring and rounding of edges. PFERD offers tools for both flexible as well as for defined work on edges.

Materials that can be worked:

- Steel and cast steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron
- Plastics, other materials

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

Flexible work on edges with the 3, 3 PLUS and 5 cuts and the special cut (SP)

Tungsten carbide burrs for flexible work on edges achieve almost exact chamfers or radii due to their special shapes. They can also be used flexibly in hard-to-reach areas.

Advantages:

- Can be guided freely.
- Extremely flexible for use in hard-to-reach areas.
- Creates almost exact chamfers and radii.

Applications:

- Flexible work on edges
- Flexible chamfering
- Flexible deburring
- Rounding edges
- Countersinking
- Work on hard-to-reach, reverse-side edges

Recommendations for use:

- In exceptional cases, it is possible to work at less than 3,000 RPM. This is preferable for certain stationary applications or when countersinking with 360° use of the burr surface.
- For applications with low stock removal (deburring, chamfering, minor work on surfaces), the rotational speed can be increased by up to 100 %.
- In general, burrs are used counter-rotationally or with a swinging motion. To achieve fine finishes or to achieve very smooth chamfers, pass the tool rapidly over the workpiece in the direction of rotation.

Defined work on edges with the EDGE cut

Tungsten carbide burrs with the EDGE cut have been especially developed for defined work on edges. The special design allows the burr to run directly along the edges without damaging the workpiece. Exact edge shapes can therefore be created in a single step – with either defined chamfers of 30° or 45°, or to a defined radius of 3.0 mm. Among other things, rounding edges is a precautionary measure for anti-corrosion protection according to ISO 12944-3, ISO 8501-3, SOLAS XII/6.3 (Ref. T4/3.01 MSC.1/Circ.1198).

Advantages:

- Special design for precise guidance.
- Safe and comfortable to guide.
- Create exact edge shapes in a single step.

Applications:

- Defined work on edges
- Defined deburring
- Breaking and rounding edges in steel and aluminium construction
- Rounding edges in preparation for the application of anti-corrosion coatings in shipbuilding, on crane systems and other steel constructions which are exposed to corrosion loading
- Defined chamfering for weld seam preparation for V-shaped seams (60°, ISO 9692-1)
- Defined chamfering for edge breaking (45°)

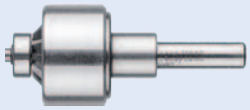
Recommendations for use:

- Use the burrs counterrotationally. In order to produce a fine surface, finally pass them over the edges in the direction of rotation.
- If possible, use EDGE cut burrs with the PFERD compressed-air straight grinder PG 3/210 with matching guide sleeve EFH PG 3/210 (see the info box on the right).

PFERDVALUE:

PFERDEFFICIENCY recommends burrs with EDGE cut for long fatigue-free and resource-saving work with perfect results in a very short period of time.

EDGE Cutting System (ECS)



The EDGE Cutting System consists of burrs with the EDGE cut and a special guide sleeve that can be positioned on any conventional drive to ensure optimal guidance during light deburring work (see pages 83–84).

Advantages:

- Improved guidance.
- Can be used with any conventional straight grinder.
- Burr is interchangeable.

Compressed-air straight grinder PG 3/210 DH and accessories

The combination of this compressed-air straight grinder, the specially designed guide sleeve for this drive and burrs with the EDGE cut, guarantees optimal guidance for creating exact edge shapes.

Advantages:

- Improved guidance thanks to additional contact surface.
- Exhaust is discharged towards the front, so that the thermal load on the workpiece and the tool is reduced (this is a particular advantage when working with materials which do not conduct heat well, such as stainless steel (INOX)).
- Avoids the build-up of chip deposits when working on aluminium materials.
- Chips are removed in a targeted way by the drive's exhaust air.

Ordering data:
Compressed-air straight grinder:
EAN 4007220**606315**

Guide sleeve:
EAN 4007220**948897**

Guide plate:
EAN 4007220**967676**

Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Select the cut.
❸ Establish the cutting speed range.

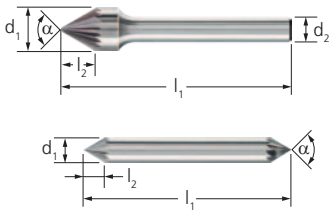
To determine the recommended rotational speed range [RPM], please proceed as follows:

❹ Select the required burr diameter.
❺ The cutting speed range and the burr diameter determine the recommended rotational speed range.

❶ Material group			Application	❷ Cut	❸ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Work on edges	3	450–600 m/min
				3 PLUS	
				SP	
				EDGE	600–900 m/min
	Hardened, heat-treated steels over 1,200 N/mm² (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Work on edges	3	250–350 m/min
				3 PLUS	
				SP	
				5	350–450 m/min
				EDGE	600–750 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Work on edges	3	250–350 m/min
				3 PLUS	
				SP	
				5	350–450 m/min
Non-ferrous metals	Soft non-ferrous metals	Soft aluminium alloys	Work on edges	EDGE ALU	900–1,100 m/min
		Brass, copper, zinc		3	600–900 m/min
				EDGE	
				3 PLUS	
				SP	
	Hard non-ferrous metals	Bronze, hard aluminium alloys (high Si content)	Work on edges	EDGE ALU	900–1,100 m/min
				3	250–450 m/min
				3 PLUS	
		Titanium/titanium alloys	Work on edges	EDGE	
				SP	
	High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)	Work on edges	5	350–600 m/min
				EDGE	250–450 m/min
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Work on edges	3	450–600 m/min
				3 PLUS	
				SP	
				EDGE	600–900 m/min
Plastics, other materials	Fibre-reinforced plastics (GRP/CRP), thermoplastics		Work on edges	EDGE ALU	750–1,100 m/min

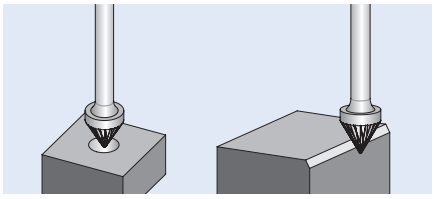
Example:
TC burr,
EDGE cut,
burr dia. of 16 mm.
Machining steels up to 1,200 N/mm².
Cutting speed: 600–900 m/min
Rotational speed range:
12,000–18,000 RPM

❹ Burr dia. [mm]	❺ Cutting speeds [m/min]						
	250	350	450	600	750	900	1,100
	Rotational speeds [RPM]						
3	27,000	37,000	48,000	64,000	80,000	95,000	117,000
6	13,000	19,000	24,000	32,000	40,000	48,000	59,000
8	10,000	14,000	18,000	24,000	30,000	36,000	44,000
10	8,000	11,000	14,000	19,000	24,000	29,000	35,000
12	7,000	9,000	12,000	16,000	20,000	24,000	30,000
13	6,000	9,000	11,000	15,000	18,000	22,000	27,000
16	5,000	7,000	9,000	12,000	15,000	18,000	22,000



Conical counterbore shape KSJ and conical counterbore shape KSJ (double-ended)

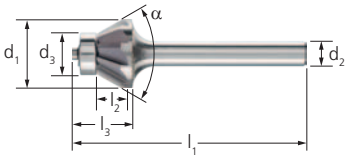
Conical counterbore burr according to DIN 8032 with cut conforming to DIN 8033, with point angle (60°). The KSJ 0605/6 (double-ended) type is cut and usable on both sides. Suitable for flexible counterboring and chamfering.



Recommendations for use:
- Information on the characteristics of the available cuts can be found on page 12.

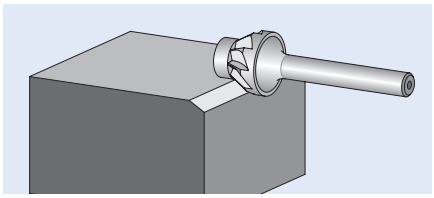
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3	Cut 5		Description
					EAN 4007220			
Shank dia. 6 mm								
6	5	6	50	60°	047552	-	1	KSJ 0605/6 Z ...
10	8	6	53	60°	047576	-	1	KSJ 1008/6 Z ...
16	13	6	56	60°	047491	047507	1	KSJ 1613/6 Z ...



Conical counterbore shape KSJ EDGE

Conical counterbore burr for the production of precisely defined chamfers. Suitable for counterboring and chamfering of defined 30° chamfer angles.



Ordering notes:
- Please complete the description with the desired cut.

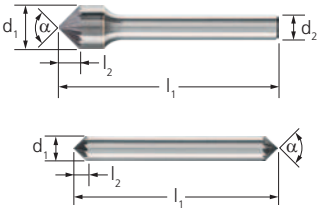
PFERDVALUE:

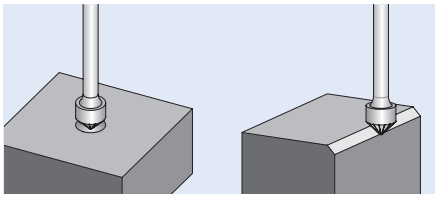
Time Saving | Energy Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	d_3 [mm]	l_3 [mm]	α	Cut EDGE	Cut EDGE ALU		Description
							EAN 4007220			
Shank dia. 6 mm										
16	5	6	54	10	14	60°	952443	098011	1	KSJ 1605/6 ... 30°

Conical counterbore shape KSK and conical counterbore shape KSK (double-ended)

Conical counterbore burr according to DIN 8032 with cut conforming to DIN 8033, with angle (90°). The KSK 0603/6 (double-ended) type is cut and usable on both sides. Suitable for flexible counterboring and chamfering.





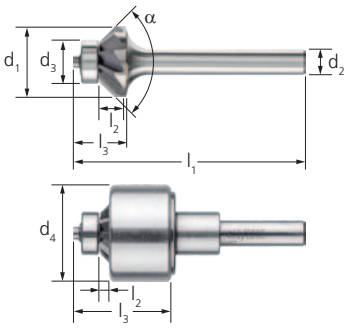
Recommendations for use:
- Information on the characteristics of the available cuts can be found on page 12.

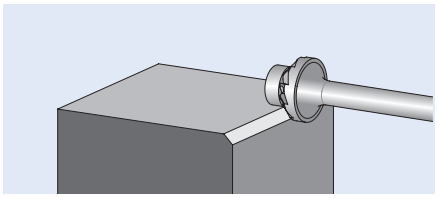
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3	Cut 5		Description
					EAN 4007220			
Shank dia. 6 mm								
6	3	6	50	90°	047569	-	1	KSK 0603/6 Z ...
10	5	6	50	90°	047583	-	1	KSK 1005/6 Z ...
16	8	6	53	90°	047521	047545	1	KSK 1608/6 Z ...

Conical counterbore shape KSK EDGE

Conical counterbore burr for the production of precisely defined chamfers. Suitable for counterboring and chamfering of defined 45° chamfer angles. The chamfers created using the EDGE Cutting System (ECS) are 1.2 mm (+/- 0.2 mm) wide.





Ordering notes:
- The EDGE Cutting System (ECS) burr can be reordered and replaced if required. Matching burr: KSK 1603/6 EDGE ALU 45°.
- Please complete the description with the desired cut.

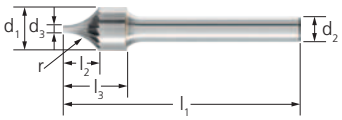
PFERDVALUE:

TimeSaving EnergySaving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	d_3 [mm]	l_3 [mm]	d_4 [mm]	α	Cut EDGE	Cut EDGE ALU		Description
								EAN 4007220			
Shank dia. 6 mm											
16	3	6	52	10	12	-	90°	952436	098004	1	KSK 1603/6 ... 45°
	1	6	52	10	24	25	90°	097984	097991	1	KSK 1603/6 ... 45° ECS

TC burrs for high-performance applications
For flexible and defined work on edges

V 1015/6

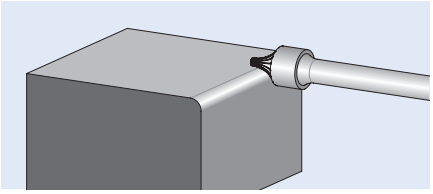


V 1215/6

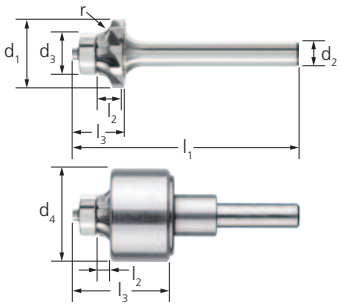
V 1315/6

Concave radius burrs V

Concave radius burrs with concave end shape, cut conforming to DIN 8033. Cannot be re-sharpened. Suitable for the production and processing of outer radii and rounded edges.

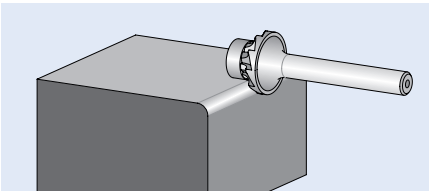


d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	d_3 [mm]	l_3 [mm]	r [mm]	r_1 [mm]	Cut 3		Description
								EAN 4007220		
Shank dia. 6 mm										
10	8	6	55	2	15	10.0	-	049174	1	V 1015/6 Z3
12	7	6	55	6	15	10.0	-	049204	1	V 1215/6 Z3
13	10	6	55	3	15	10.0	1.5	049198	1	V 1315/6 Z3



Concave radius burrs V EDGE

Concave radius burrs for the production of precise radii. Cannot be re-sharpened. Suitable for the production and processing of 3 mm outer radii.

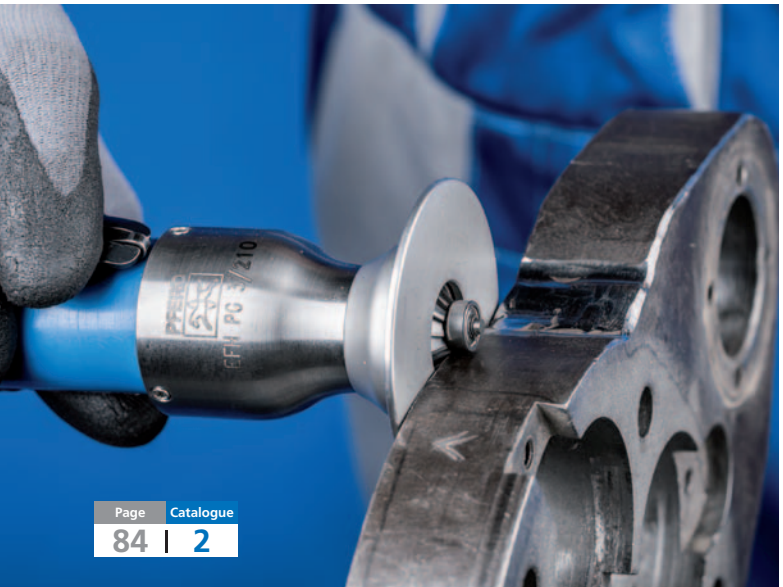


Ordering notes:
- The EDGE Cutting System (ECS) burr can be reordered and replaced if required. Matching burr: V 1612/6 EDGE R3,0

PFERDVALUE:

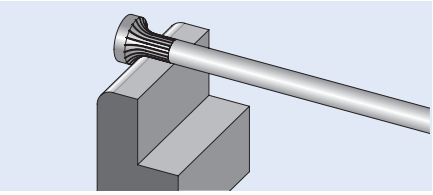
Time Saving | Energy Saving

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	d_3 [mm]	l_3 [mm]	d_4 [mm]	r [mm]	Cut EDGE		Description
								EAN 4007220		
Shank dia. 6 mm										
16	3	6	52	10	12	-	3.0	952412	1	V 1612/6 EDGE R3,0
					24	25	3.0	098028	1	V 1612/6 EDGE R3,0 ECS



Radius burrs R

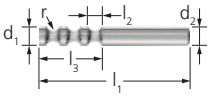
Radius burrs with a concave shape and special cut. Suitable for the production and processing of outer radii and rounded edges. Cannot be re-sharpened.



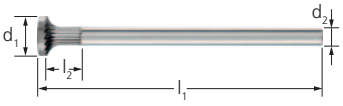
Ordering notes:

- Two types are available: Cylindrical with triple concave contour; or concave shape, tapered towards shank

R 0625/6
R 0830/8

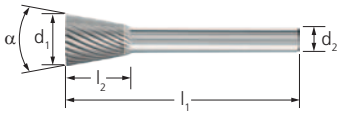


R 1618/8



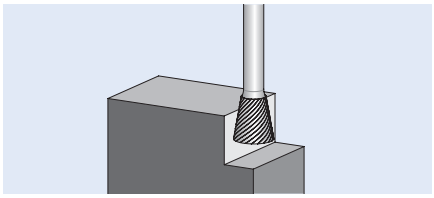
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	l_3 [mm]	r [mm]	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 6 mm								
6	5	6	65	25	3.0	952016	1	R 0625/6 SP
Shank dia. 8 mm								
8	5	8	65	27	3.0	049150	1	R 0830/8 SP
16	12	8	118	18	6.0	049167	1	R 1618/8 SP

The PFERD product range includes numerous tools which are suitable for work on edges. We have compiled these special solutions for you in our FOCUS brochure. Please contact us for further details.



Inverted cones WKN without end cut

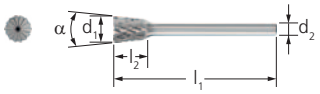
Inverted cone-shaped burr, tapered towards the shank according to DIN 8032 with cut conforming to DIN 8033. Suitable for work on hard-to-reach, reverse-side edges.



Recommendations for use:
- Information on the characteristics of the available cuts can be found on page 12.

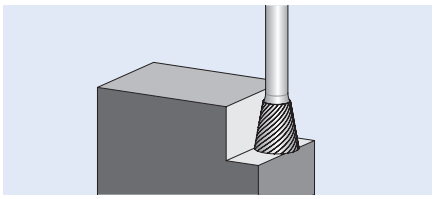
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3	Cut 3 PLUS	Cut 5		Description
					EAN 4007220				
Shank dia. 3 mm									
3	7	3	37	8°	-	233863	233870	1	WKN 0307/3 Z ...
6	7	3	37	10°	-	233887	233894	1	WKN 0607/3 Z ...
Shank dia. 6 mm									
10	13	6	53	10°	049211	-	-	1	WKN 1013/6 Z ...
12	13	6	53	20°	049235	-	-	1	WKN 1213/6 Z ...
16	13	6	53	20°	049242	-	-	1	WKN 1613/6 Z ...



Inverted cones WKNS with end cut

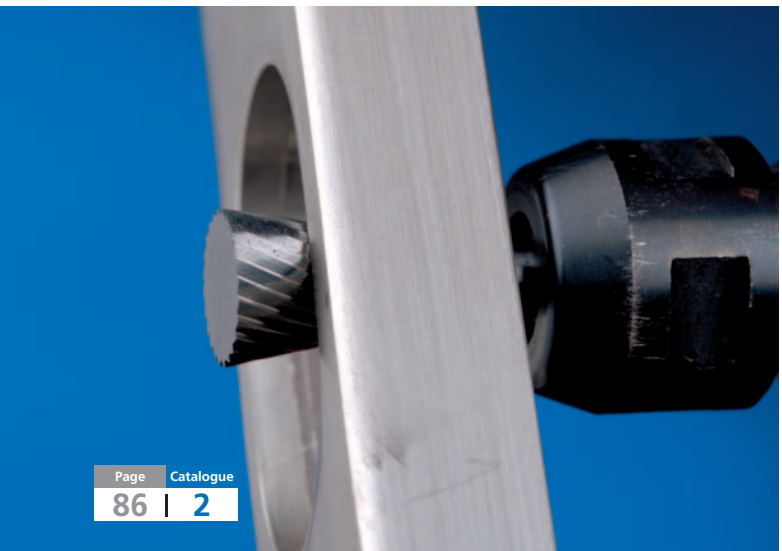
Inverted cone-shaped burr, tapered towards the shank according to DIN 8032 with cut conforming to DIN 8033. Shape WKNS with end cut. Suitable for work on hard-to-reach, reverse-side edges.

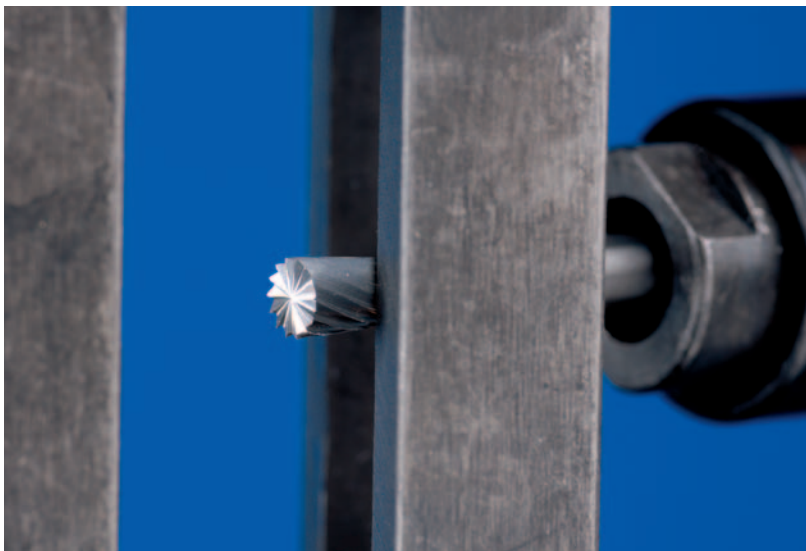


Recommendations for use:
- Information on the characteristics of the available cuts can be found on page 12.

Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3 PLUS	Cut 5		Description
					EAN 4007220			
Shank dia. 3 mm								
3	7	3	37	8°	049716	049709	1	WKNS 0307/3 Z ...
6	7	3	37	10°	049730	049723	1	WKNS 0607/3 Z ...





HSS rotary cutters
For fine and coarse stock removal

HSS rotary cutters have a special tooth geometry and ensure high quality. They can also be used cost-effectively with low-power tool drives at low rotational speeds.

Advantages:

- Highly aggressive.
- Can be used at low rotational speeds.
- Very robust tooth cutting edges due to the toughness of the high-speed steel (HSS).

Materials that can be worked:

- Steel
- Stainless steel (INOX)
- Non-ferrous metals
- Cast iron

Applications:

- Deburring
- Machining contours
- Machining edges (chamfering, rounding)
- Milling out
- Work on weld seams
- Cutting out holes
- Levelling

Recommendations for use:

- Use HSS rotary cutters if your drive unit does not allow for high rotational speeds.
- When used on soft materials, HSS rotary cutters can be an economical alternative to tungsten carbide burrs.
- In contrast to tungsten carbide burrs, HSS rotary cutters need to be used with lower rotational speeds.
- The recommended rotational speeds and cutting speeds for the 3 cut can be used for HSS rotary cutters with a special cut.
- Antenna burrs and light-metal burrs are an exception to this. The specific rotational speeds and cutting speeds for these tools can be found on pages 96–97.
- If the smallest area of the burr diameter is being used, the recommended rotational speed can be increased accordingly.

Matching tool drives:

- Flexible shaft drive
- Straight grinder
- Robot
- Machine tools

Safety notes

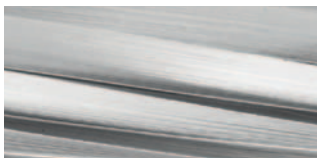
= Wear eye protection!

= Wear hearing protection!

= Observe the recommended rotational speed, especially when using burrs with long shanks!

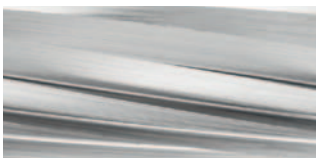
= Wearing protective gloves is recommended. Handle the tool drive with both hands.

ALU cut



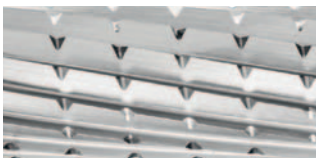
- Machining of soft non-ferrous metals, brass, copper, aluminium alloys, plastics, fibre-reinforced plastics and rubber.
- Rotational speed range of 4,000 to 6,000 RPM depending on the burr diameter.

1 cut



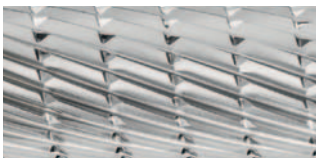
- Machining of steel, cast steel and stainless steel (INOX).
- Rotational speed range of 1,200 to 23,900 RPM depending on the burr diameter.

2 cut with chip breaker

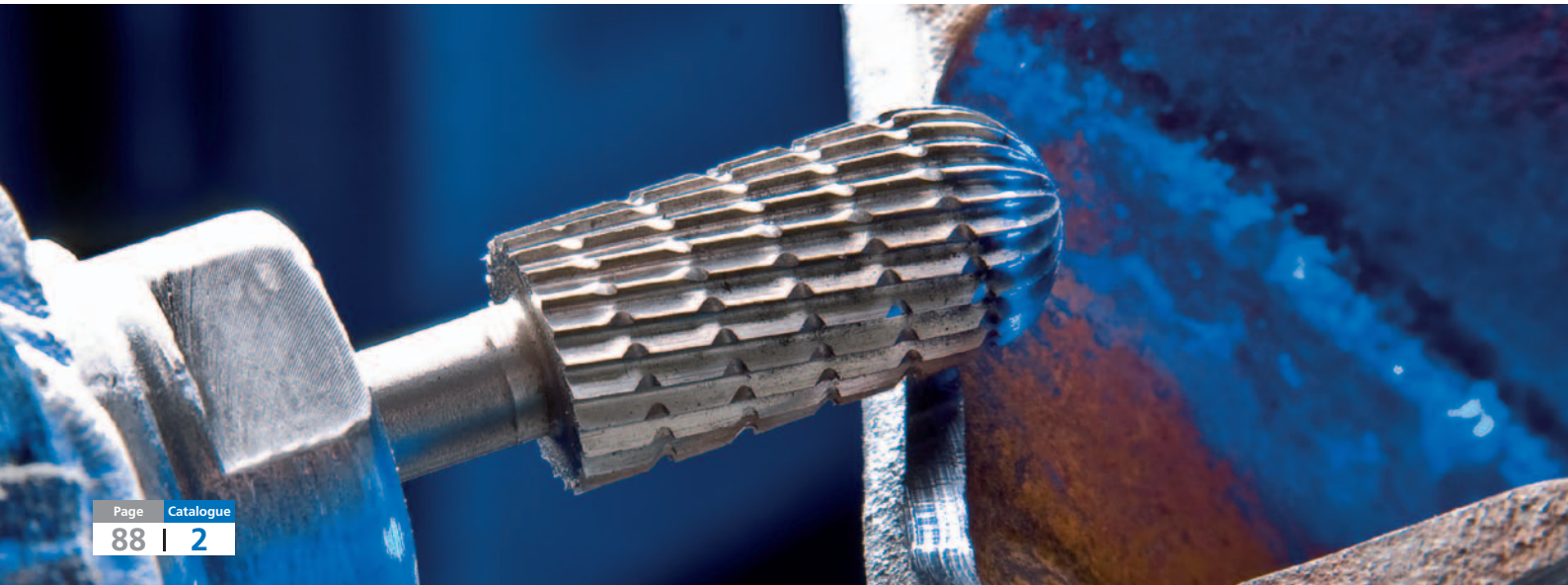


- Machining of steel, cast steel and cast iron.
- Finishing work, e.g. deburring steel, cast steel and cast iron, non-ferrous metals and plastics.
- Rotational speed range of 1,200 to 13,200 RPM depending on the burr diameter.

Z3 cut with chip breaker



- Machining of steel, cast steel and cast iron.
- Finishing work, e.g. deburring steel, cast steel and cast iron.
- Rotational speed range of 1,200 to 7,900 RPM depending on the burr diameter.



Recommended rotational speed range [RPM]

To determine the recommended cutting speed range [m/min], please proceed as follows:

❶ Select the material group to be machined.
❷ Determine the type of application.
❸ Select the cut.
❹ Establish the cutting speed range.

To determine the recommended rotational speed range [RPM], please proceed as follows:

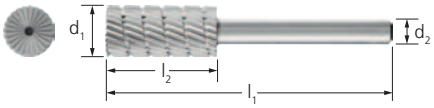
❺ Select the required burr diameter.
❻ The cutting speed range and the burr diameter determine the recommended rotational speed range.

❶ Material group			❷ Application	❸ Cut	❹ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm² (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, alloyed steels	Coarse stock removal	2	60–80 m/min
				3	
				SP	
			Fine stock removal	3	80–100 m/min
				SP	
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	1	60–80 m/min
			Fine stock removal	1	80–100 m/min
				2	60–80 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys, brass, copper, zinc	Coarse stock removal	ALU	200–300 m/min
				1	
			Fine stock removal	2	200–250 m/min
Cast iron	Grey cast iron, white cast iron	Cast iron with flake graphite EN-GJL (GG), with nodular graphite/nodular cast iron EN-GJS (GGG), white annealed cast iron EN-GJMW (GTW), black cast iron EN-GJMB (GTS)	Coarse stock removal	2	60–80 m/min
				3	
				SP	
			Fine stock removal	3	80–100 m/min
				SP	
Plastics, other materials	Fibre-reinforced thermoplastics and duroplastics, hard rubber, wood		Coarse stock removal	ALU	200–300 m/min
				1	
			Fine stock removal	1	250–300 m/min
				2	200–250 m/min

Example:
HSS rotary cutter,
2 cut,
cutter dia. of 12 mm.
Coarse stock removal on steels up to 1,200 N/mm².
Cutting speed: 60–80 m/min
Rotational speed range: 1,600–2,200 RPM

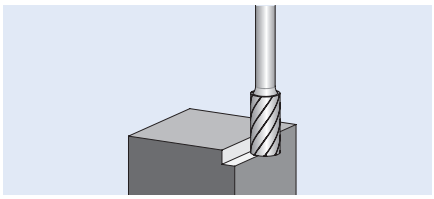
❺ Burr dia. [mm]	❻ Cutting speeds [m/min]					
	60	80	100	200	250	300
	Rotational speeds [RPM]					
1.6	12,000	16,000	19,900	39,800	49,800	59,700
2.3	8,400	11,100	13,900	27,700	34,600	41,600
3.2	6,000	8,000	10,000	19,900	24,900	29,900
4.0	4,800	6,400	8,000	16,000	19,900	23,900
5.0	3,900	5,100	6,400	12,800	16,000	19,100
6.0	3,200	4,300	5,400	10,700	13,300	16,000
7.0	2,800	3,700	4,600	9,100	11,400	13,700
8.0	2,400	3,200	4,000	8,000	10,000	12,000
10.0	2,000	2,600	3,200	6,400	8,000	9,600
12.0	1,600	2,200	2,700	5,400	6,700	8,000
14.0	1,400	1,900	2,300	4,600	5,700	6,900
16.0	1,200	1,600	2,000	4,000	5,000	6,000

HSS rotary cutters
For fine and coarse stock removal



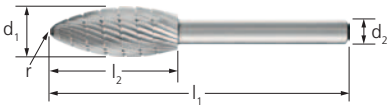
Cylindrical shape with end cut A-ST

Cylindrical rotary cutter with end cut.



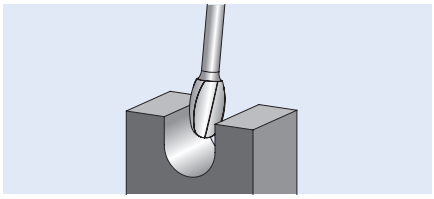
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut 1	Cut 2	Cut 3		Description
							EAN 4007220		
Shank dia. 6 mm									
4	13	6	60	-	-	-	058596	5	HSS A 0413ST/6 Z ...
6	16	6	60	-	058602	058619	058626	5	HSS A 0616ST/6 Z ...
8	20	6	60	-	-	-	058640	5	HSS A 0820ST/6 Z ...
10	13	6	53	-	058657	058664	058671	5	HSS A 1013ST/6 Z ...
	20	6	60	-	-	-	058695	5	HSS A 1020ST/6 Z ...
12	25	6	65	-	058701	058718	058725	5	HSS A 1225ST/6 Z ...
16	25	6	65	801345	-	058756	058763	5	HSS A 1625ST/6 Z ...

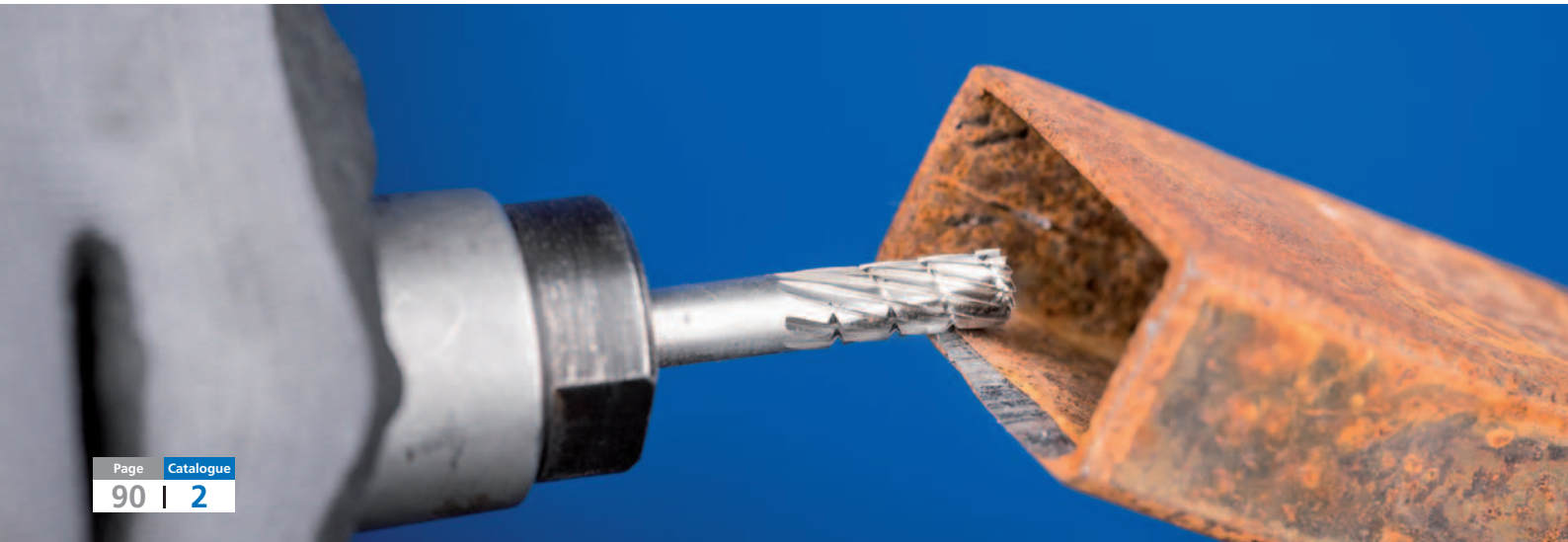


Flame shape B

Flame-shaped rotary cutter.

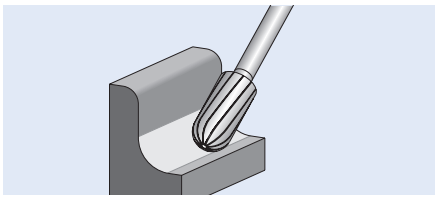


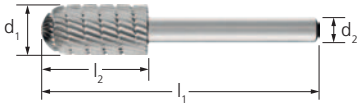
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut 3		Description
					EAN 4007220		
Shank dia. 6 mm							
8	20	6	60	1.5	058787	5	HSS B 0820/6 Z3
12	30	6	70	2.0	058794	5	HSS B 1230/6 Z3
16	35	6	75	2.6	058800	5	HSS B 1635/6 Z3



Cylindrical shape with radius end C

Cylindrical rotary cutter with radius end.





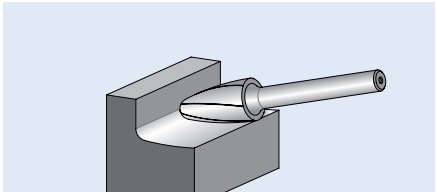
Ordering notes:

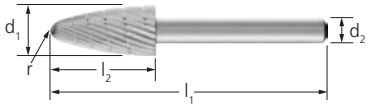
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut 1	Cut 2	Cut 3		Description
				EAN 4007220					
Shank dia. 6 mm									
6	16	6	60	-	058824	058831	058848	5	HSS C 0616/6 Z ...
8	20	6	60	-	-	-	058879	5	HSS C 0820/6 Z ...
10	20	6	60	-	-	-	058893	5	HSS C 1020/6 Z ...
12	25	6	65	-	058909	058916	058923	5	HSS C 1225/6 Z ...
16	25	6	65	058947	-	-	058961	5	HSS C 1625/6 Z ...

Tree shape with radius end H

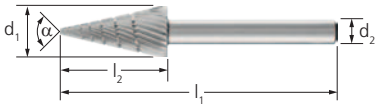
Tree-shaped rotary cutter with radius end.





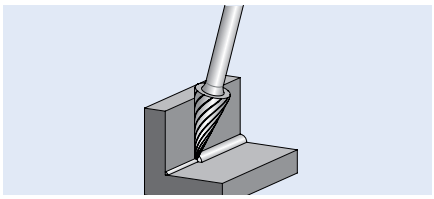
d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut 3		Description
					EAN 4007220		
Shank dia. 6 mm							
6	18	6	60	1.5	059319	5	HSS H 0618/6 Z3
8	20	6	60	1.2	059326	5	HSS H 0820/6 Z3
10	20	6	60	2.5	059333	5	HSS H 1020/6 Z3
12	25	6	65	2.5	059357	5	HSS H 1225/6 Z3
16	30	6	70	3.6	059364	5	HSS H 1630/6 Z3

HSS rotary cutters
For fine and coarse stock removal



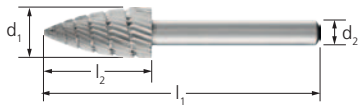
Conical pointed shape G

Conical pointed rotary cutter, flattened tip.



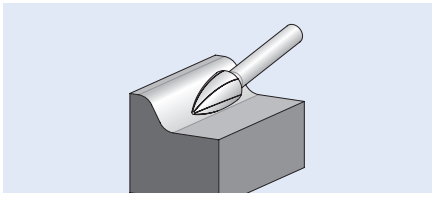
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 1	Cut 2	Cut 3		Description
							EAN 4007220		
Shank dia. 6 mm									
6	18	6	60	14°	-	-	059210	5	HSS G 0618/6 Z ...
10	20	6	60	28°	059234	059241	059258	5	HSS G 1020/6 Z ...
12	25	6	65	27°	059272	059289	059296	5	HSS G 1225/6 Z ...



Pointed tree shape K

Pointed tree-shaped rotary cutter, flattened tip.

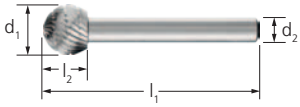


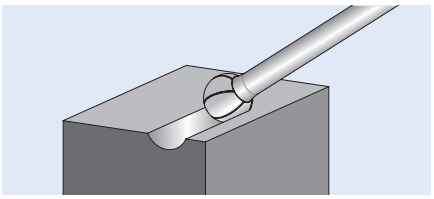
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut ALU	Cut 1	Cut 2	Cut 3		Description
							EAN 4007220		
Shank dia. 6 mm									
6	18	6	60	-	-	059388	059395	5	HSS K 0618/6 Z ...
10	20	6	60	-	-	-	059425	5	HSS K 1020/6 Z ...
12	25	6	65	-	059432	-	059456	5	HSS K 1225/6 Z ...
	30	6	70	-	059470	059487	059494	5	HSS K 1230/6 Z ...
16	30	6	70	059517	-	059524	059531	5	HSS K 1630/6 Z ...

Ball shape F

Ball-shaped rotary cutter.



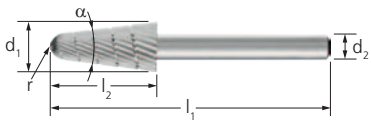


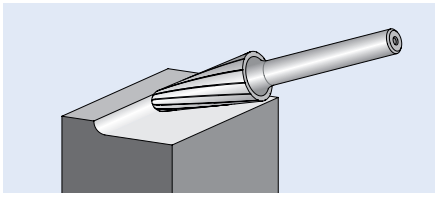
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	Cut 1	Cut 2	Cut 3		Description
				EAN 4007220				
Shank dia. 6 mm								
4	3	6	55	-	-	058992	5	HSS F 0403/6 Z ...
6	5	6	55	-	-	059029	5	HSS F 0605/6 Z ...
8	7	6	55	059043	059050	059067	5	HSS F 0807/6 Z ...
10	9	6	49	-	-	059098	5	HSS F 1009/6 Z ...
12	10	6	51	059111	-	059135	5	HSS F 1210/6 Z ...
16	14	6	54	059159	059166	059173	5	HSS F 1614/6 Z ...

Conical shape with radius end L

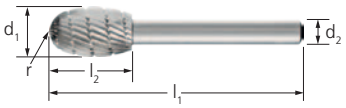
Conical rotary cutter with radius end.





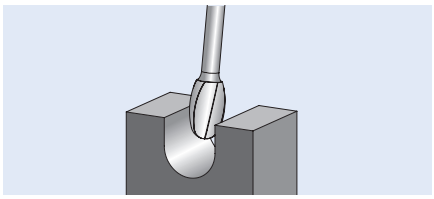
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	r [mm]	Cut ALU	Cut 3		Description
						EAN 4007220			
Shank dia. 6 mm									
10	20	6	60	14°	2.9	-	059579	5	HSS L 1020/6 Z ...
12	25	6	65	14°	3.3	-	059593	5	HSS L 1225/6 Z ...
	30	6	70	14°	2.6	-	059609	5	HSS L 1230/6 Z ...
16	30	6	70	14°	4.8	059616	059630	5	HSS L 1630/6 Z ...



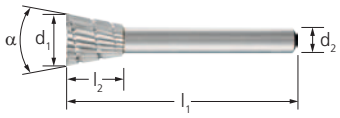
Oval shape O

Oval rotary cutter.



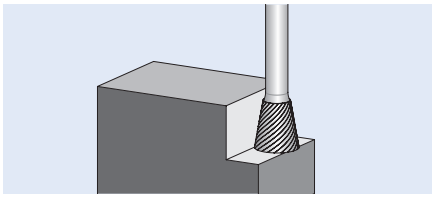
Ordering notes:
- Please complete the description with the desired cut.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut ALU	Cut 1	Cut 3		Description
							EAN 4007220		
Shank dia. 6 mm									
6	10	6	55	2.8	-	-	059678	5	HSS O 0610/6 Z ...
10	16	6	56	4.0	-	-	059692	5	HSS O 1016/6 Z ...
12	20	6	60	5.0	-	059708	059722	5	HSS O 1220/6 Z ...
16	25	6	65	6.5	059746	-	059760	5	HSS O 1625/6 Z ...



Inverted cone with end cut W-ST

Inverted cone-shaped rotary cutter, tapered towards the shank, with end cut.



d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3		Description
						EAN 4007220	
Shank dia. 6 mm							
12	13	6	53	20°	059784	5	HSS W 1213ST/6 Z3

Set 81 HSS

Set 81 HSS contains 10 HSS rotary cutters in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.

Contents:
10 HSS rotary cutters, shank diameter of 6 mm, cut 3, 1 piece each:

HSS A 0616ST/6 Z3	HSS K 0618/6 Z3
HSS A 1013ST/6 Z3	HSS K 1230/6 Z3
HSS A 1225ST/6 Z3	HSS K 1630/6 Z3
HSS C 0616/6 Z3	HSS F 1210/6 Z3
HSS C 1225/6 Z3	HSS L 1630/6 Z3

Cut		Description
3		
EAN 4007220		
Shank dia. 6 mm		
060957	1	81 HSS

Set 82 HSS

Set 82 HSS contains 10 HSS rotary cutters in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.
The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.

Contents:
10 HSS rotary cutters, shank diameter of 6 mm, cut 3, 1 piece each:

HSS A 1013ST/6 Z3	HSS L 1020/6 Z3
HSS A 1625ST/6 Z3	HSS L 1630/6 Z3
HSS K 1630/6 Z3	HSS O 1625/6 Z3
HSS F 1614/6 Z3	HSS W 1213ST/6 Z3
HSS G 1020/6 Z3	HSS 45/6 Z3

Cut		Description
3		
EAN 4007220		
Shank dia. 6 mm		
060988	1	82 HSS

Set 83 HSS

Set 83 HSS contains 18 HSS rotary cutters in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage.

Contents:
18 HSS rotary cutters, shank diameter of 6 mm, cut 3, 1 piece each:

HSS A 0616ST/6 Z3	HSS K 1230/6 Z3	HSS G 1225/6 Z3
HSS A 1225ST/6 Z3	HSS F 0403/6 Z3	HSS O 0610/6 Z3
HSS C 0616/6 Z3	HSS F 0807/6 Z3	HSS O 1220/6 Z3
HSS C 1225/6 Z3	HSS F 1210/6 Z3	HSS 55/6 Z3
HSS K 0618/6 Z3	HSS F 1614/6 Z3	HSS 63/6 Z3
HSS K 1225/6 Z3	HSS G 0618/6 Z3	HSS 64/6 Z3

Cut		Description
3		
EAN 4007220		
Shank dia. 6 mm		
060995	1	83 HSS

HSS 45/6

HSS 55/6

HSS 63ST/6

HSS 64/6

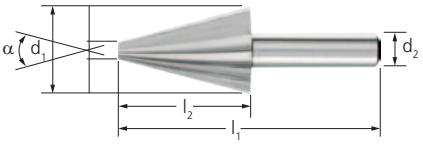
Special shapes shank dia. 6 mm

Rotary cutters in 4 special shapes with a shank diameter of 6 mm. Perfectly suited to diverse milling work due to their different shapes.

Explanation of the code system:

d_1 = rotary cutter diameter
l_2 = cut length
d_2 = shank diameter
l_1 = total length
α = angle

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut 3 EAN 4007220		Description
Shank dia. 6 mm							
12	18	6	58	-	056035	5	HSS 45/6 Z3
6	20	6	60	-	056424	5	HSS 55/6 Z3
12	30	6	70	7°	056738	5	HSS 63ST/6 Z3
				-	056776	5	HSS 64/6 Z3



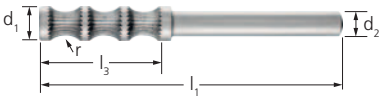
HSS antenna cutter

Conical cutter with special cut and a shank diameter of 8 mm. For stepless milling and enlarging bores and holes, e.g. antenna mounting holes in a car body.

Recommendations for use:

- Rotational speed range for drilling: 200–500 RPM.
- Max. 9,000 RPM when using the smallest burr diameter, e.g. for sheet edge work.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	d_1 min [mm]	α	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 6 mm								
20	30	8	60	4	31°	057902	1	HSS 104/8 SP



HSS edge trimming cutter

Due to their 3 identical cutting areas, this HSS edge trimming cutter provides three milling areas. Cylindrical rotary cutter with triple, concave contour and special cut, with a shank diameter of 6 mm. Suitable for edge breaking to a defined radius.

Recommendations for use:

- Cutting speed range of 60–80 m/min, rotational speed range of 3,100–4,200 RPM
- Max. 9,000 RPM when using the smallest burr diameter, e.g. for sheet edge work.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 6 mm							
8	30	6	70	5.0	057964	1	HSS 156/6 SP

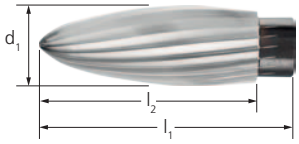
HSS aluminium cutters with female thread

Multi-purpose rotary cutters for use on light metals, similar to the tree shape.
Available in two different special cuts, with female thread M10.

Recommendations for use:
- For work on soft non-ferrous metals: Cutting speed range of 200–300 m/min, rotational speed range of 3,100–4,700 RPM.
- For work on aluminium, up to max. 9,000 RPM.

Ordering notes:
- HSS 120 is supplied with chip breaker.

HSS 119



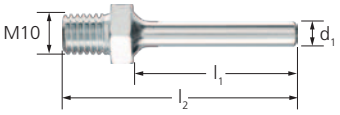
HSS 120

d_1 [mm]	l_1 [mm]	l_2 [mm]	Female thread DIN	Suitable arbors	Cut / Special cut (SP) / EAN 4007220		Description
20	62	53	M10	BO 6/10, BO 8/10	057919	1	HSS 119 M10 SP
	54	45	M10	BO 6/10, BO 8/10	057926	1	HSS 120 M10 SP

Arbors

Arbor for tools with female thread

Suitable for tools with female thread M10.



d_1 [mm]	l_1 [mm]	l_2 [mm]	Thread	Suitable for	EAN 4007220		Description
6	40	57	M10	HSS 119, HSS 120	062111	1	BO 6/10 M10
8	40	57	M10	HSS 119, HSS 120	062128	1	BO 8/10 M10

HSS engraving cutters

HSS engraving cutters

Suitable for fine stock removal in small and hard-to-reach places.
Available with special cut and in various shapes and dimensions.

Explanation of the code system:
d_1 = rotary cutter diameter
l_2 = cut length
d_2 = shank diameter
l_1 = total length
α = angle

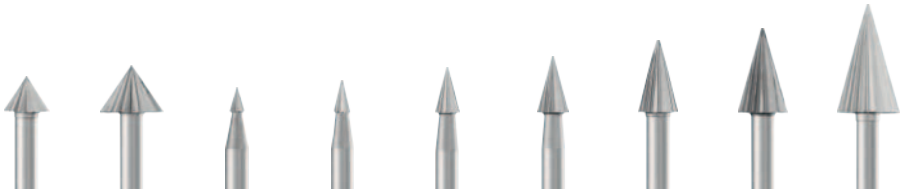
301/6

305/6

306/6

311/6

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut / Special cut (SP) / EAN 4007220		Description
Shank dia. 6 mm							
3	2.7	6	60	-	057971	5	301/6 SP
	4.5	6	60	-	058015	5	305/6 SP
	4.5	6	60	34°	058022	5	306/6 SP
6	5.6	6	60	-	058077	5	311/6 SP



906 908 911 922 923 924 925 926 928

906–928

Tools designed specifically for fine stock removal.

Available with special cut, 9 different rotary cutter shapes and dimensions, a shank diameter of 3 mm and a shank length of 30 mm.

Explanation of the code system:

d_1 = rotary cutter diameter
l_2 = cut length
d_2 = shank diameter
l_1 = total length
α = angle

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	α	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 3 mm							
6	4.2	3	34.2	71°	058190	5	906/3 SP
8	5.6	3	35.6	71°	058213	5	908/3 SP
1.6	2.8	3	32.8	28°	058244	5	911/3 SP
2.3	4	3	34	29°	058251	5	922/3 SP
3.2	5.6	3	35.6	30°	058268	5	923/3 SP
4.2	7	3	37	32°	058275	5	924/3 SP
5.2	8.7	3	38.7	32°	058282	5	925/3 SP
6.2	10.5	3	40.5	32°	058299	5	926/3 SP
8.2	14	3	44	32°	058312	5	928/3 SP

941 942 943 944 945 946 947 948

951 952 953 954

941–954

Tools designed specifically for fine stock removal.

Available with special cut, 12 different rotary cutter shapes and dimensions, a shank diameter of 3 mm and a shank length of 30 mm.

Explanation of the code system:

d_1 = rotary cutter diameter
l_2 = cut length
d_2 = shank diameter
l_1 = total length
α = angle
r = radius

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 3 mm							
1.6	1.4	3	31.4	-	058329	5	941/3 SP
2.3	1.7	3	31.7	-	058336	5	942/3 SP
3.2	2.2	3	32.2	-	058343	5	943/3 SP
4	2.9	3	32.9	-	058350	5	944/3 SP
5	4.4	3	34.4	-	058367	5	945/3 SP
6	5	3	35	-	058374	5	946/3 SP
7	6	3	36	-	058381	5	947/3 SP
8	7	3	37	-	058398	5	948/3 SP
	2	3	32	9.5	058404	5	951/3 SP
10	2.5	3	32.5	11.5	058411	5	952/3 SP
12	3	3	33	14.0	058428	5	953/3 SP
14	3.5	3	33.5	15.5	058435	5	954/3 SP

961–987

Tools designed specifically for fine stock removal.

Available with special cut, 10 different rotary cutter shapes and dimensions, a shank diameter of 3 mm and a shank length of 30 mm.

Explanation of the code system:

d_1 = rotary cutter diameter
l_2 = cut length
d_2 = shank diameter
l_1 = total length
α = angle
r = radius

Ordering notes:

- HSS finishing cutters 987 are supplied with a chip breaker.

d_1 [mm]	l_2 [mm]	d_2 [mm]	l_1 [mm]	r [mm]	α	Cut Special cut (SP) EAN 4007220		Description
Shank dia. 3 mm								
8	2	3	32	1.1	-	058442	5	961/3 SP
10	2.3	3	32.3	1.15	-	058459	5	962/3 SP
12	2.6	3	32.6	1.3	-	058466	5	963/3 SP
14	3	3	33	1.5	-	058473	5	964/3 SP
6	1	3	31	-	-	058480	5	971/3 SP
8	1	3	31	-	-	058497	5	972/3 SP
10	1	3	31	-	-	058503	5	973/3 SP
7	10	3	40	1.9	22°	058534	5	979/3 SP
6	10	3	40	-	-	058572	5	986/3 SP
7	12	3	42	-	-	058589	5	987/3 SP

Set 84 HSS

Set 84 HSS contains 15 HSS finishing cutters for fine stock removal in the most common shapes and dimensions. The sturdy plastic box protects the tools from dirt and damage. The tools are suitable for fine stock removal in small and hard-to-reach places.

Contents:

15 HSS finishing cutters,
shank diameter of 3 mm, special cut
1 piece each:

923	952	947	945
928	924	954	951
943	941	926	973
946	944	942	

Cut Special cut (SP) EAN 4007220		Description
Shank dia. 3 mm		
061008	1	84 HSS

Products made to order
Customer-specific tool solution

As a tool manufacturer with over 200 years of experience, PFERD can call on comprehensive expertise in the manufacture of tool solutions. The findings from our internal research and development, as well as from day-to-day practice on site with our customers, contribute to the development of each individual PFERD tool. Our production plant in Marienheide, Germany, works with state-of-the-art technology and there are many ways in which we can respond to individual needs.

Our range of custom-made PFERD tools comprises also solid carbide milling cutters.

1. Process analysis and tool development

Make an appointment with our experienced sales representatives and technical advisers.
You can find our worldwide sales addresses at www.pferd.com.

Our employees will **analyse your application with you on-site** and develop the most economic individual tool solution for you! You will then receive a quote.

2. Production

Our production teams subsequently create a technical drawing with which your made-to-order product will be produced.

Each burr is supplied **in premium PFERD quality**. We always work to the highest standards, from the inspection of raw materials, through inspections during the course of production by our staff, up to the final visual inspection of each individual burr.

The quality of PFERD tools is certified according to ISO 9001.

3. Use

Our flexible production and global logistics network ensure that you receive your new tool on time.

Our sales representatives will be happy to help if you have any further questions relating to the optimization of your applications or to the improvement of the working environment.

See the quality, performance and economic value of PFERD tools for yourself!

PFERD

Milling tools with cutting inserts

2

Catalogue 2 | Page 101

Milling tools with cutting inserts
ALUMASTER High Speed Disc

The innovative **ALU**MASTER High Speed Disc is a unique tool with an extremely high stock removal rate which has been developed especially for use on angle grinders. It is ideal for processing aluminium as it does not generate hazardous or explosive dust. It consists of ten specially developed tungsten carbide cutting inserts, which are fixed to the very light, but extremely robust GRP disc.

Advantages:

- Can be used on angle grinders (diameter of 115/125 mm).
- Does not generate hazardous or explosive dust.
- An extraction system is not required.
- Cost-effective and eco-friendly alternative to reinforced grinding wheels and flap discs of comparable weight.
- Innovative, light yet robust cut geometry with integrated depth gauge for:
  - The highest degree of safety
  - Extreme durability
  - Comfortable work.
- Specially developed, turnable and replaceable tungsten carbide cutting inserts.
- Exceptionally high stock removal rate.

Materials that can be worked:

- Aluminium alloys
- Brass, copper, zinc
- Plastics
- Fibre-reinforced duroplastics (GRP, CRP)

Applications:

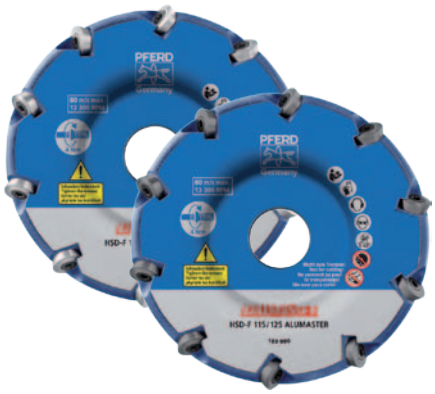
- Milling out
- Work on weld seams
- Work on fillet welds
- Work on edges/chamfering
- Surface work

Recommendations for use:

- The tool has primarily been designed for use on aluminium, wrought aluminium alloys and cast aluminium. Non-ferrous metals with a relatively low strength and fibre-reinforced plastics can also be machined. This must be checked for the specific application on a case-by-case basis.
- To maximize cost-effectiveness, preferably use the tool on compressed-air angle grinders with a power output of 1,000 watts or more, or electric angle grinders with a rated output of 1,400 watts or more.
- Do not exert unnecessarily high forces on the angle grinder. The **ALU**MASTER High Speed Disc already works with low forces. The weight of the angle grinder is enough.
- Use the **ALU**MASTER HSD-F at an angle of 5–30°, or up to 60° in special cases.
- Do not push the tool deep into the workpiece. The milling disc is not a cutting tool.
- When machining workpiece edges, cut along the edge, never across the edge.
- Do not decelerate the tool on the workpiece. The cutting inserts may break.

Industries:

- Shipbuilding and yacht construction
- Wagon construction
- Silo and container construction
- Vehicle construction



PFERDVALUE:

PFERDERGONOMICS recommends **ALU**MASTER and **ALU**MASTER HICOAT High Speed Discs as an innovative tool solution for comfortable working with significantly reduced vibration and less noise.

Emission Filter

PFERDEFFICIENCY recommends **ALU**MASTER and **ALU**MASTER HICOAT High Speed Discs for long fatigue-free and resource-saving work with perfect results in a very short period of time.

Energy Saving | **Waste** Saving | **Time** Saving | **Resource** Saving

ALUMASTER with HICOAT coating

PFERD also offers the cutting inserts with a premium-quality HICOAT coating for lubricating aluminium casting alloys with a silicon content of 5–10 %, abrasive aluminium casting alloys with a silicon content of over 15 % and for other abrasive materials or non-ferrous metals. This prevents tool clogging and abrasive wear, even in use on these particularly demanding materials.

Advantages:

- Extremely hard.
- Very low friction coefficient.
- Very low tendency towards adhesion.
- Improved surface quality.
- Reduced burr formation.

Materials that can be worked:

- Lubricating aluminium casting alloys with silicon contents of 5–10 %
- Sticky, greasy materials
- Abrasive aluminium casting alloys with silicon contents of > 15 %
- Abrasive materials such as fibre-reinforced plastics (FRP)
- Non-ferrous alloys of higher strength than aluminium (bronze, brass, etc.)

Selecting suitable cutting inserts:

To determine the most suitable cutting insert, please proceed as follows:

❶ Select the material group to be machined.
❷ Select the cutting inserts.

❶ Material group			❷ Cutting inserts	
			High-performance application	Universal application
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	HICOAT	uncoated
		Brass, copper, zinc	HICOAT	uncoated
	Hard non-ferrous metals	Hard aluminium alloys (high Si content)	HICOAT	-
		Bronze	HICOAT	-
Plastics	Fibre-reinforced plastics (GRP/CRP), thermoplastics		HICOAT	-

Safety notes:

- It is essential to tighten the flange nut using the appropriate tool, such as a face pin wrench. Clamping systems which are designed to be tightened without the use of an additional tool, i.e. which are tightened by hand, are not permissible. Suitable clamping nuts can be found in catalogue section 9.
- Tighten the mounting bolts of the cutting inserts using the Torx key provided. If used properly, it is designed to provide a tightening torque of around 4 Nm. Alternatively, use a torque spanner with a tightening torque of 4 Nm.
- Loose cutting inserts may break during use. Therefore, **check regularly whether they are attached securely**.
- Do not use damaged cutting inserts! They may break!
- Only use original accessories from PFERD.

CE = CE-marked

= Do not use if damaged!

= Do not use for cutting!

= Wear eye protection!

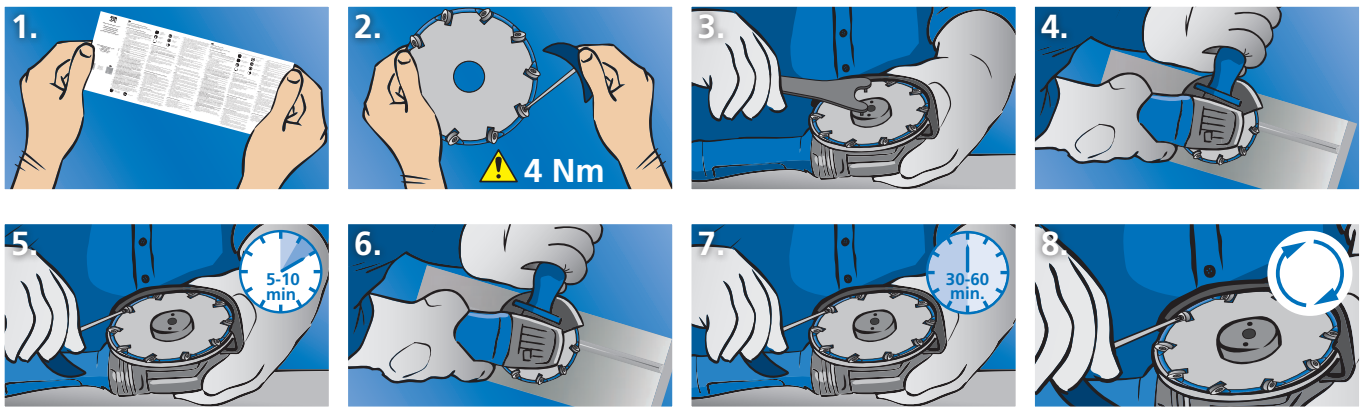
= Wear gloves!

= Wear hearing protection!

= Follow the safety instructions!

5-60° = Observe the contact angle of 5–60° (**ALU**MASTER HSD-F)!

4 Nm **Tighten the bolts!**



ALUMASTER **HSD-F High Speed Disc**

Special tool for processing aluminium alloys using an angle grinder.

Contents:
- **ALU**MASTER HSD-F High Speed Disc
- Cutting insert set
- Screw set for cutting inserts
- Torx wrench, plastic box

PFERDVALUE:

Emission Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

D [mm]	H [mm]	U [mm]	Max. RPM	EAN 4007220		Description
115	22.23	13.0	13,300	026106	1	HSD-F 115/125 ALUMASTER

ALUMASTER **HSD-F HICOAT High Speed Disc**

Special tool for processing particularly challenging aluminium alloys using an angle grinder. The cutting inserts come with a HICOAT coating.

Contents:
- **ALU**MASTER HSD-F HICOAT High Speed Disc
- HICOAT cutting insert set
- Screw set for cutting inserts
- Torx wrench, plastic box

PFERDVALUE:

Emission Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

D [mm]	H [mm]	U [mm]	Max. RPM	EAN 4007220		Description
115	22.23	13.0	13,300	061213	1	HSD-F 115/125 ALUMASTER HICOAT

Cutting insert sets, HICOAT cutting insert sets

Cutting insert set for **ALU**MASTER High Speed Disc.

Ordering notes:
- The set is available with or without HICOAT coating.

D [mm]	Contents [pcs.]	Suitable for	EAN 4007220		Description
12	10	ALUMASTER HSD-F	018583	1	WSP-A-12R ALUMASTER
			061220	1	WSP-A-12R ALUMASTER HICOAT

Screw set for cutting inserts

Screw set for PFERD cutting inserts.

Suitable for cutting inserts	Contents [pcs.]	EAN 4007220		Description
WSP-A-12R ALUMASTER, WSP-A-12R ALUMASTER HICOAT	5	005392	1	WSP-S-M4S

ALUMASTER service set, ALUMASTER HICOAT service set

For exchanging individual cutting inserts on the **ALU**MASTER High Speed Disc.

Set contains:
- 2 cutting inserts
- 2 bolts
- 1 TORX wrench

Ordering notes:
- The set is available with or without HICOAT coating.

Suitable for	EAN 4007220		Description
ALUMASTER HSD-F	061237	1	ASS-R12
	061244	1	ASS-R12 HICOAT

Torque spanner and spare blade

WIHA torque spanner with a tightening torque of 4 Nm for optimally and securely mounting cutting inserts on the **ALU**MASTER High Speed Disc.

Suitable for	EAN 4007220		Description
Torque spanner			
ALUMASTER	104620	1	DSWK WIHA Torque 4,0
Spare blade			
DSWK WIHA 4.0	104637	1	TWK WIHA Torque T15

Milling tools with cutting inserts
EDGE FINISH system for work on edges

Alongside a drive which has been especially designed for work on edges, the EDGE FINISH system comprises cutting tools for defined chamfering and rounding/breaking of edges on medium to large workpieces.

Exact edge shapes can be created by selecting the relevant tungsten carbide cutting inserts and matching tool mounting. The special tungsten carbide cutting inserts come with a high-quality coating and achieve the very best results. They are available in the **STEEL, INOX and ALU versions** for creating chamfers of 30° and 45° on components made from steel, stainless steel (INOX) and aluminium. For steel applications, there is also a radius version which has been specifically designed to prepare for corrosion protection, producing a defined radius of 3 mm.

Among other things, rounding edges is a precautionary measure for anti-corrosion protection according to:
- ISO 12944-3
- ISO 8501-3
- SOLAS XII/6.3 (Ref. T4/3.01 MSC.1/Circ. 1198

Advantages:

- Highest possible comfort and optimal guidance thanks to ergonomically optimized design and very good haptic properties.
- The best possible stock removal rate and a long service life thanks to specially coated cutting inserts.
- Chamfer height can be individually adjusted up to 6 mm.
- Enables work with low levels of fatigue thanks to SENSOHANDLE anti-vibration handle.

Applications:

- Rounding edges in preparation for the application of anti-corrosion coatings in shipbuilding, on crane systems and other medium to large steel constructions which are exposed to corrosion loading.
- Chamfering for weld seam preparation on medium to large components (60° V-shaped seam in accordance with ISO 9692-1).
- Chamfering for edge breaking (45° visible edge).

Materials that can be worked:

- Steel
- Stainless steel (INOX)
- Aluminium

Recommendations for use:

- Move the EDGE FINISH system over the workpiece counterrotationally in order to prevent damage to the tool and chatter marks on the workpiece.
- Process very uneven burn burrs beforehand using reinforced grinding wheels or POLIFAN flap discs to prevent damage to the cutting inserts and improve guidance.
- Proper servicing and correct storage will increase the service life of your drive and tool.

Safety notes:

- Do not use damaged cutting inserts! They may break!

= Wear eye protection!

= Wear gloves!

= Wear hearing protection!

= Observe the applicable safety regulations!

= Observe the recommended rotational speed!

PFERDVALUE:

PFERDERGONOMICS recommends the EDGE FINISH system as an innovative tool solution for comfortable working with reduced vibration, good haptics and optimized tool guidance.

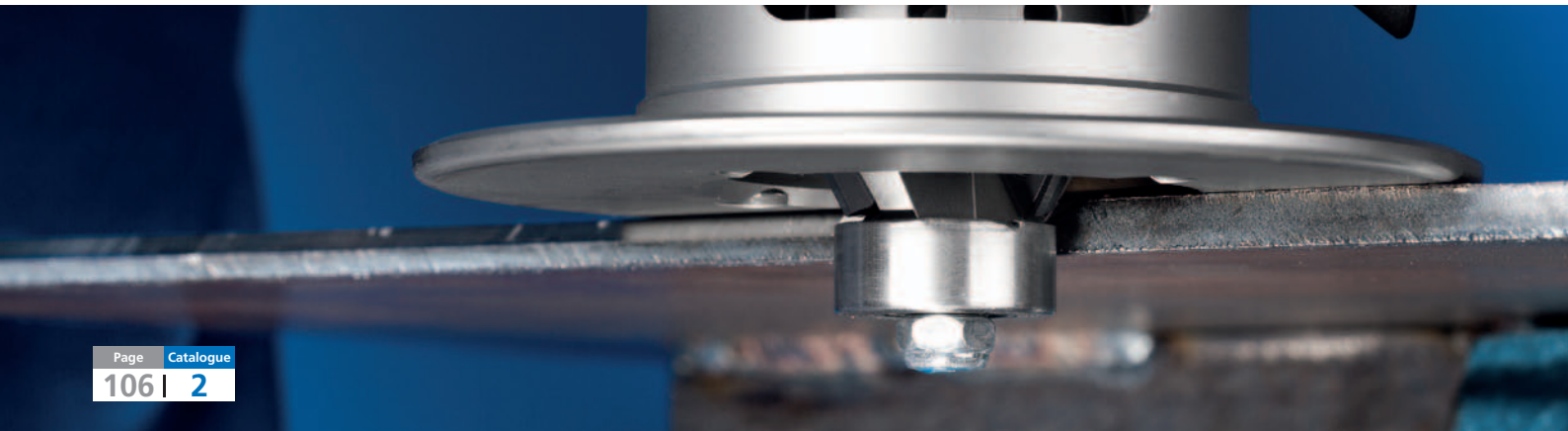
PFERDEFFICIENCY recommends the EDGE FINISH system for long, fatigue-free and resource-saving work, with perfect results in the shortest possible time.

Selecting suitable cutting inserts:

To determine the most suitable cutting insert, please proceed as follows:

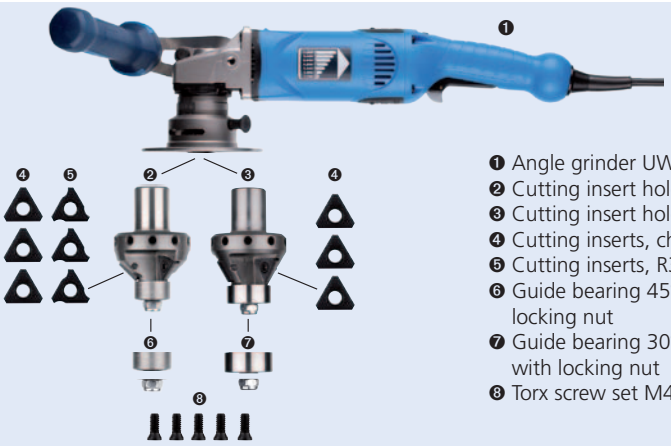
❶ Select the material group to be machined.
❷ Select the cutting inserts.

Material group	Matching cutting inserts	Recommended rotational speed range [RPM]	Max. depth of cut per process step [mm]	Max. chamfer width/radius to be created [mm]
Steel	EF-WSP-F STEEL	7,100–8,700	3	6
	EF-WSP-R3 STEEL	7,100–8,700	-	3
Stainless steel (INOX)	EF-WSP-F INOX	7,500–8,000	2	3
Aluminium	EF-WSP-F ALU	11,000	6	6



EDGE FINISH system for work on edges

A powerful angle grinder with a rotational speed of 2,750–11,000 RPM forms the basis of this impressive system. Two different cutting insert holders are available and can be exchanged at any time if required. They specify the required angle of 30° or 45°, and each comes with three tungsten carbide cutting inserts. In combination with a high-quality coating, they enable an outstanding stock removal rate and produce defined chamfers or radii depending on the version being used. The guide bearing ensures the tool is optimally guided along the edges to be machined. All parts described are available both individually and as a complete system. A sturdy transport case is also available and provides ideal protection for the parts and plenty of space for accessories.



❶ Angle grinder UWER 18/110 EF
❷ Cutting insert holder 45°/R3
❸ Cutting insert holder 30°
❹ Cutting inserts, chamfer
❺ Cutting inserts, R3
❻ Guide bearing 45°/R3 with locking nut
❼ Guide bearing 30° with locking nut
❽ Torx screw set M4

EDGE FINISH system for work on edges in transport case (TK)

Special features:
- Max. chamfer height of 6 mm.
- Stepless rotational speed control.
- Digital electronics for constant rotational speed.
- Restart protection in case of power failure.
- Anti-vibration handle.
- Smooth start-up to protect people, tools and the drive.
- Lockable on-off switch.
- Spindle lock pin.

Included in delivery:
4 m power cable, 3 keys, anti-vibration handle

UWER 18/110 EF-R3/45° TK and UWER 18/110 EF-30° TK

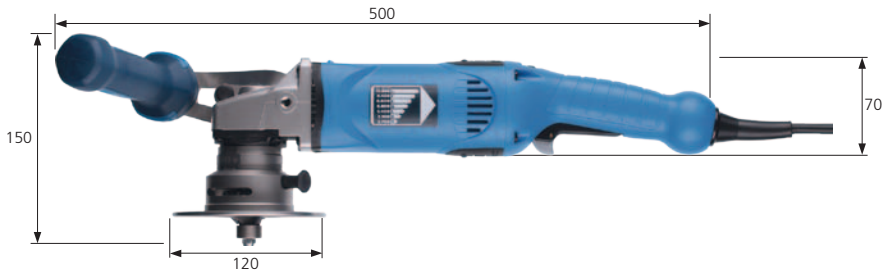
The drive and tools are supplied in a sturdy plastic case for optimal storage. Included in delivery:
- UWER 18/110 EF with 4 m power cable, three keys and anti-vibration handle
- Cutting insert holder with guide bearing
- Screw set for cutting inserts

The ordering data can be found in the table below.

Detailed information and the matching assembly accessories for angle grinder UWER 18/110 EF can be found in catalogue section 9 Tool drives.

UWER 18/110 EF

11,000–2,750 RPM / 1,750 watts

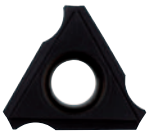


PFERDVALUE

Vibration Filter · Haptic Filter · Energy Saving · Waste Saving · Time Saving · Resource Saving

Designation	EAN 4007220	Rotational speed [RPM]	Voltage [volts] 50–60 Hz	Power consumption [watts]	Power output [watts]	Work spindle thread	Incl. cutting insert holder	Matching cutting insert holder	Net weight [kg]
EDGE FINISH UWER 18/110 EF-R3/45° TK 230V[1)]	004272	11,000–2,750	230	1,750	1,150	M14	EF-WSP-A R3/45°	EF-WSP-A R3/45°, EF-WSP-A 30°	7.360
EDGE FINISH UWER 18/110 EF-30° TK 230V[1)]	004364	11,000–2,750	230	1,750	1,150	M14	EF-WSP-A 30°	EF-WSP-A R3/45°, EF-WSP-A 30°	7.360
EDGE FINISH UWER 18/110 EF TK 230V[2)]	973172	11,000–2,750	230	1,750	1,150	M14	-	EF-WSP-A R3/45°, EF-WSP-A 30°	3.640

[1)] The cutting inserts are not included in delivery. Please order these separately (see page 108).
[2)] The cutting insert holder with guide bearing, cutting inserts and bolt set are not included in delivery. Please order these separately (see page 108).


EF-WSP-R3

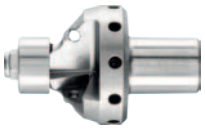
EF-WSP-F

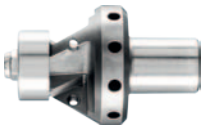
Cutting insert set with 3 mm radius, cutting insert set with chamfer

Cutting insert sets for the EDGE FINISH system for work on edges.

Ordering notes:
- Please complete the description with the desired type.

Suitable for cutting insert holder	α	r [mm]	Contents [pcs.]	Type				Description
				STEEL	INOX	ALU		
				EAN 4007220				
Cutting insert set with 3 mm radius								
EF-WSP-A R3/45°	-	3.0	3	005101	-	-	1	EF-WSP-R3
Cutting insert set chamfer								
EF-WSP-A 30°, EF-WSP-A R3/45°	45°–30°	-	3	005118	071182	039533	1	EF-WSP-F


EF-WSP-A R3/45°


EF-WSP-A 30°

Cutting insert holder with 3 mm radius/45° chamfer, cutting insert holder with 30° chamfer

Cutting insert holders for the EDGE FINISH system for work on edges.

Ordering notes:
- The cutting inserts and matching screw sets are not included in the delivery. Please order separately.

Suitable for cutting inserts	Suitable for machine types	α	r [mm]	EAN 4007220		Description
Cutting insert holder with 3 mm radius/45° chamfer						
EF-WSP-R3, EF-WSP-F	UWER 18/110 EF	45°	3.0	005200	1	EF-WSP-A R3/45°
Cutting insert holder with 30° chamfer						
EF-WSP-F	UWER 18/110 EF	30°	-	005170	1	EF-WSP-A 30°

EF-FL-R3/45°

EF-FL-30°

Guide bearing with 3 mm radius/45° chamfer, guide bearing with 30° chamfer

Guide bearings for the EDGE FINISH system for work on edges.

Suitable for cutting insert holder	EAN 4007220		Description
Guide bearing with 3 mm radius/45° chamfer			
EF-WSP-A R3/45°	005163	1	EF-FL-R3/45°
Guide bearing with 30° chamfer			
EF-WSP-A 30°	005132	1	EF-FL-30°

Screw set for cutting inserts

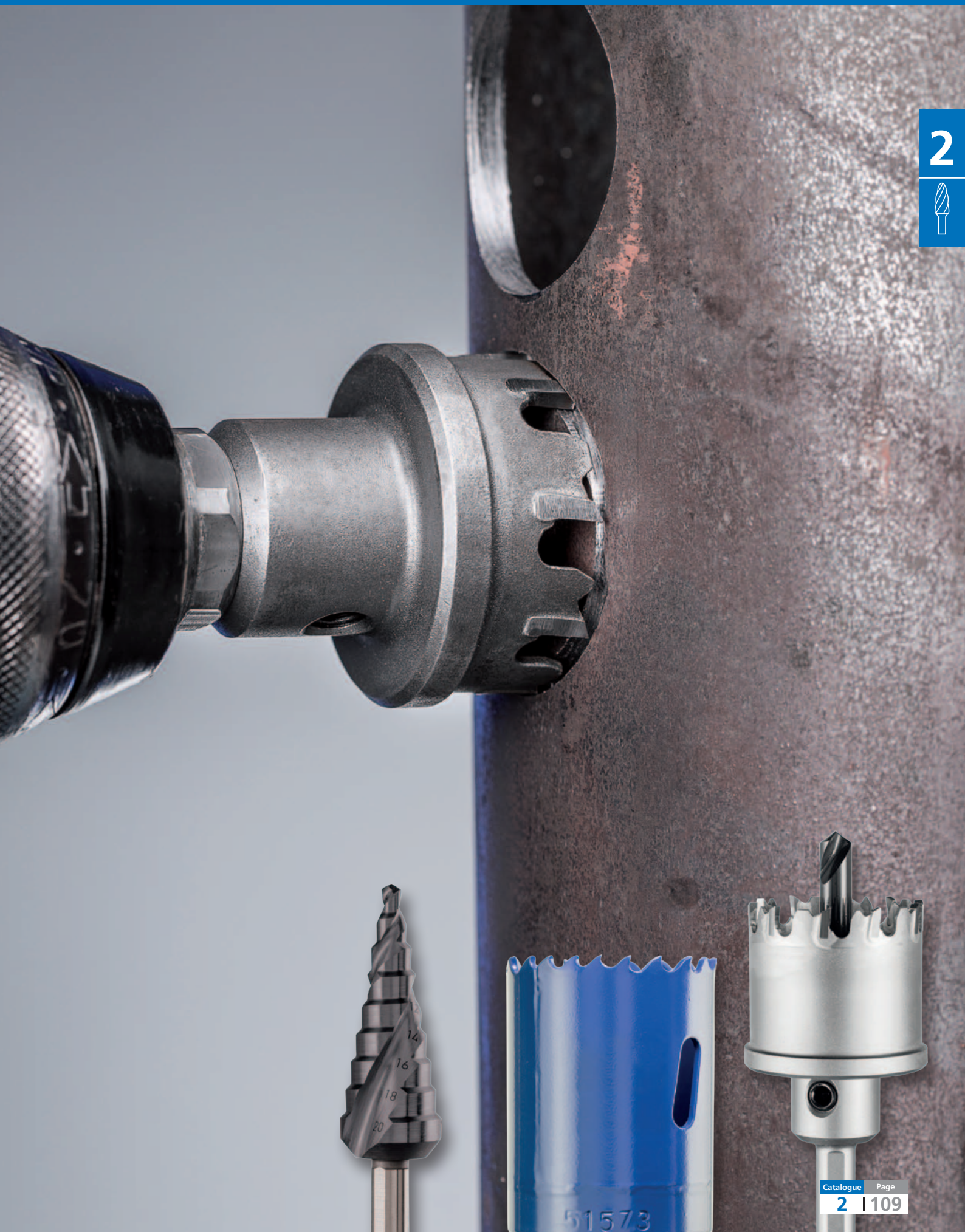
Screw set for PFERD cutting inserts.

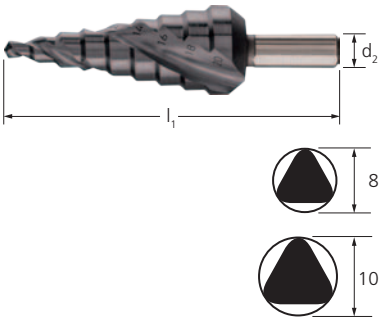
Suitable for cutting inserts	Contents [pcs.]	EAN 4007220		Description
EF-WSP-R3, EF-WSP-F	5	005392	1	WSP-S-M4S

PFERD

HSS step drills, HSS hole saws, sets and accessories

2





HSS step drills with HICOAT coating

Sturdy high-performance tool for burr-free drilling and deburring of sheet metal, pipes and profiles. Materials up to 4 mm thick can be drilled and deburred easily in a single step. The premium HICOAT coating is wear-resistant and versatile as it can be used to process steel, stainless steel (INOX), non-ferrous metals, thermoplastics and duroplastics.

Advantages:
- Drilling and deburring in a single step.
- Completely smooth running and a high cutting performance.
- The high-quality drill tip ensures effortless centring and drilling.
- The tool taper makes it easier to pull back from drilled plates.
- Chips which do not break are neatly removed as with a spiral drill.
- Built-up edges and cold welding on the blades are prevented.

Materials that can be worked:
steel, stainless steel (INOX), other non-ferrous metals, plastics

Applications:
drilling, deburring

Recommendations for use:
- Use HSS step drills with HICOAT coating on sheets, pipes and profiles with a maximum thickness of 4 mm.
- Use cutting oil or compressed air as a coolant and lubricant.
- Please refer to the table for the recommended rotational speeds.

Matching tool drives:
Power drill

Drill bit dia. range [mm]	No. of drill steps	d_2 [mm]	l_1 [mm]	EAN 4007220		Description
4–20	9	8	75	802755	1	STB HSS 04-20/8 HC-FEP
4–30	14	10	100	802762	1	STB HSS 04-30/10 HC-FEP

Recommended rotational speed range [RPM] for HSS step drills

Step dia. [mm]	Steel	Stainless steel (INOX)	Non-ferrous metals	Plastics
	Rec. rotational speed [RPM]			
4	2,390	1,590	2,390	1,590
6	1,590	1,060	1,590	1,060
8	1,190	800	1,190	800
10	950	640	950	640
12	800	530	800	530
14	680	450	680	450
16	600	400	600	400
18	530	350	530	350
20	480	320	480	320
22	430	290	430	290
24	400	270	400	270
26	370	240	370	240
28	340	230	340	230
30	320	210	320	210

Hole saws are made from tough, shatter-proof, sturdy HSS bimetal. The saw teeth are made from high-quality M42 material. A selection of the most common HSS hole saws is available as sets for tradespeople, fitters, electricians and mechanics.

Advantages:

- Cost-effective sawing of round cut-outs.
- Chattering during sawing is prevented by the alternating tooth pitch.
- High concentricity.
- Good chip removal.
- The hole saw is conveniently centred and guided via the replaceable HSS pilot drill.
- Hole saw arbor is supplied with an ejection spring for improved ejection of the sawn material.

Materials that can be worked:

- Steel
- Stainless steel (INOX)
- Aluminium
- Copper, bronze, brass
- Plastics
- Wood

Applications:

- Cutting out holes

Recommendations for use:

- Observe the recommended rotational speed.
- Clamp the pilot drill in the hole saw arbor and make sure that it projects at least 3 mm (1/8") over the teeth of the hole saw.
- When cutting metals, use a high-quality cutting oil, if possible. This facilitates smooth running and lengthens the hole saw service life.
  Exception: When working on aluminium, use kerosene instead of cutting oil.
- HSS hole saws are suitable for work on stainless steel (INOX). In order to avoid corrosion, remove any particles which develop during work from the workpiece. Clean the workpiece chemically or mechanically (etching/polishing, etc.).
- Make sure that all the teeth are applied evenly. To prevent tooth breakage, avoid swinging movements during sawing.
- Avoid overheating the saw.

Matching tool drives:

- Power drill

Safety notes:

- When using shank extensions, the recommended hole saw rotational speed must not be exceeded. Risk of accidents!

= Wear eye protection!

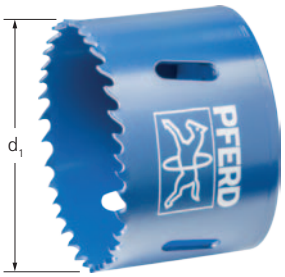
= Follow the safety instructions!

Example applications for HSS hole saws and TC hole cutters

Dia. [mm]	Applications
25.0	Plumbing and heating pipes
30.0	Plumbing and heating pipes
32.0	Sink fittings with dia. 32 mm
35.0	Plumbing and heating pipes, hollow wall junction boxes, halogen spots
40.0	Plumbing and waste pipes
45.0	Water and heating pipes

Dia. [mm]	Applications
50.0	Water and heating pipes with insulation
55.0	Built-in lights with dia. 55 mm
60.0	Built-in lights with dia. 60 mm
68.0	Pattress boxes with dia. 68 mm
70.0	Hollow wall junction boxes with dia. 70 mm

Dia. [mm]	Applications
74.0	Hollow wall junction boxes with dia. 74 mm
80.0	Distribution boxes, built-in lights, cable opening covers with dia. 80 mm
90.0	Built-in lights with dia. 90 mm
105.0	Waste air pipes



HSS hole saws

Hole saws made from tough, shatter-proof, sturdy HSS bimetal for cutting out holes.

Thread:
LS 14–LS 30 = 1/2–20
LS 32–LS 152 = 5/8-18

Matching arbors:
LS 14–LS 30 = LSS 1, LSS 4
LS 32–LS 152 = LSS 2

Ordering notes:
- Please refer to the table below for the maximum cutting depth.
- Please order hole saw arbors separately. Detailed information and ordering data on hole saw arbors can be found on page 115.

d_1 [mm]	d_1 [inch]	EAN 4007220	Max. cutting depth [mm]	Max. cutting depth [inch]	Opt. RPM Steel	Opt. RPM Stainless steel (INOX)	Opt. RPM Non-ferrous metals	Opt. RPM Plastics		Description
14	9/16	319086	34	1 5/16	620	310	800	1,000	1	LS 14
16	5/8	062319	34	1 5/16	550	275	730	880	1	LS 16
17	11/16	319093	36	1 7/16	520	260	680	820	1	LS 17
19	3/4	062326	36	1 7/16	460	230	600	740	1	LS 19
20	-	062333	36	1 7/16	425	210	560	700	1	LS 20
21	13/16	319109	36	1 7/16	410	205	540	670	1	LS 21
22	7/8	062340	36	1 7/16	390	195	520	640	1	LS 22
24	15/16	319116	36	1 7/16	360	180	470	580	1	LS 24
25	1	062357	36	1 7/16	350	175	470	560	1	LS 25
27	1 1/16	062364	36	1 7/16	325	160	435	520	1	LS 27
29	1 1/8	062371	36	1 7/16	300	150	400	480	1	LS 29
30	1 3/16	062388	36	1 7/16	285	145	380	470	1	LS 30
32	1 1/4	062395	36	1 7/16	275	140	360	440	1	LS 32
33	1 5/16	062401	36	1 7/16	260	135	345	420	1	LS 33
35	1 3/8	062418	36	1 7/16	250	125	330	400	1	LS 35
37	1 7/16	319123	36	1 7/16	235	115	310	370	1	LS 37
38	1 1/2	062425	36	1 7/16	230	115	300	370	1	LS 38
40	1 9/16	319130	36	1 7/16	215	110	280	350	1	LS 40
41	1 5/8	062432	36	1 7/16	210	105	280	340	1	LS 41
43	1 11/16	319147	31	1 1/4	200	100	260	330	1	LS 43
44	1 3/4	062449	31	1 1/4	195	95	260	320	1	LS 44
46	1 13/16	319154	31	1 1/4	185	90	250	300	1	LS 46
48	1 7/8	062456	31	1 1/4	180	90	240	290	1	LS 48
51	2	062463	31	1 1/4	170	85	230	270	1	LS 51
52	2 1/16	319161	31	1 1/4	165	80	220	270	1	LS 52
54	2 1/8	062470	31	1 1/4	160	80	210	260	1	LS 54
57	2 1/4	062487	31	1 1/4	150	75	200	250	1	LS 57
59	2 5/16	319178	31	1 1/4	145	70	190	240	1	LS 59
60	2 3/8	062494	31	1 1/4	140	70	190	230	1	LS 60
64	2 1/2	062500	31	1 1/4	135	65	180	220	1	LS 64
65	2 9/16	319185	31	1 1/4	135	60	180	220	1	LS 65
67	2 5/8	062517	31	1 1/4	130	65	170	210	1	LS 67
68	2 11/16	500811	31	1 1/4	130	65	170	210	1	LS 68
70	2 3/4	062524	31	1 1/4	125	60	160	200	1	LS 70
73	2 7/8	062531	31	1 1/4	120	60	160	190	1	LS 73
76	3	062548	31	1 1/4	115	55	150	180	1	LS 76
79	3 1/8	062555	31	1 1/4	110	55	140	180	1	LS 79
83	3 1/4	062562	31	1 1/4	105	50	140	170	1	LS 83
86	3 3/8	319192	31	1 1/4	100	50	130	160	1	LS 86
89	3 1/2	062579	31	1 1/4	95	45	130	160	1	LS 89
92	3 5/8	062586	31	1 1/4	95	45	120	150	1	LS 92
95	3 3/4	062593	31	1 1/4	90	45	120	150	1	LS 95
98	3 7/8	319208	31	1 1/4	90	45	120	140	1	LS 98
102	4	062609	31	1 1/4	85	40	110	140	1	LS 102
105	4 1/8	062616	31	1 1/4	80	40	110	130	1	LS 105

Continued on next page

d_1 [mm]	d_1 [inch]	EAN 4007220	Max. cutting depth [mm]	Max. cutting depth [inch]	Opt. RPM Steel	Opt. RPM Stainless steel (INOX)	Opt. RPM Non-ferrous metals	Opt. RPM Plastics		Description
111	4 3/8	319222	31	1 1/4	75	35	100	130	1	LS 111
114	4 1/2	062623	31	1 1/4	75	35	100	120	1	LS 114
121	4 3/4	319239	31	1 1/4	70	35	90	120	1	LS 121
127	5	319246	31	1 1/4	65	30	80	110	1	LS 127
140	5 1/2	319253	31	1 1/4	60	30	75	100	1	LS 140
152	6	319260	31	1 1/4	55	25	70	90	1	LS 152

HSS hole saw sets

Set for craftsmen

The set contains five HSS hole saws in the most common diameters, including accessories, for use in crafts. It is supplied in a clearly structured plastic box which protects against dirt and damage. The operating instructions are included.
It is possible to use hole saws LS 32 and LS 38 with the LSA adapter and washer.

Contents:
5 HSS hole saws: LS 22, LS 25, LS 29, LS 32 and LS 38
1 hole saw arbor: LSS 4
1 LSA adapter for hole saw arbor LSS 4
1 Allen key, 4 mm
1 ejection spring

Dimensions [mm]	EAN 4007220		Description
168 x 116 x 57	319314	1	LS-SO 7 H

Set for plumbers

The set contains six HSS hole saws in the most common diameters, including accessories, for plumbers and sanitary engineers. It is supplied in a clearly structured plastic box which protects against dirt and damage. The operating instructions are included.
It is possible to use hole saw LS 38 with the LSA adapter and washer.

Contents:
6 HSS hole saws: LS 19, LS 22, LS 29, LS 38, LS 44 and LS 57
2 hole saw arbors: LSS 2 and LSS 4
1 LSA adapter for hole saw arbor LSS 4
1 Allen key, 4 mm
1 ejection spring

Dimensions [mm]	EAN 4007220		Description
219 x 156 x 60	319338	1	LS-SO 9 I

Set for electricians (International standard sizes)

The set contains six HSS hole saws in the most common international diameters, including accessories, for electricians. It is supplied in a clearly structured plastic box which protects against dirt and damage. The operating instructions are included.
It is possible to use hole saw LS 35 with the LSA adapter and washer.

Contents:
6 HSS hole saws: LS 22, LS 29, LS 35, LS 44, LS 51 and LS 64
2 hole saw arbors: LSS 2 and LSS 4
1 LSA adapter for hole saw arbor LSS 4
1 Allen key, 4 mm
1 ejection spring

Dimensions [mm]	EAN 4007220		Description
219 x 156 x 60	319321	1	LS-SO 9 E-1

Set for electricians (German standard sizes)

The set contains nine HSS hole saws in the most common diameters, including accessories, for electricians in Germany. It is supplied in a clearly structured plastic box which protects against dirt and damage. The operating instructions are included.
It is possible to use hole saws LS 32 and LS 38 with the LSA adapter and washer.

Contents:
9 HSS hole saws: LS 19, LS 22, LS 25, LS 32, LS 38, LS 44, LS 51, LS 60 and LS 68
2 hole saw arbors: LSS 2 and LSS 4
1 LSA adapter for hole saw arbor LSS 4
1 pilot drill: LSB 6/90
1 Allen key, 4 mm
1 ejection spring

Dimensions [mm]	EAN 4007220		Description
219 x 156 x 60	319369	1	LS-SO 13 E-2

Set for engineers

The set contains nine HSS hole saws in the most common diameters, including accessories, for engineers in the construction, container and pipeline industries. It is supplied in a clearly structured plastic box which protects against dirt and damage. The operating instructions are included.
It is possible to use hole saws LS 35 and LS 38 with the LSA adapter and washer.

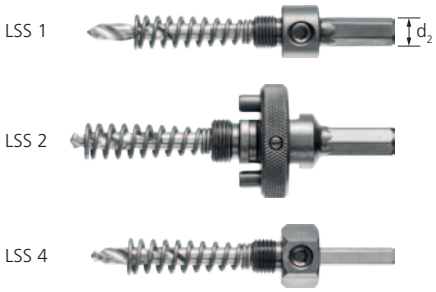
Contents:
9 HSS hole saws: LS 19, LS 22, LS 29, LS 35, LS 38, LS 44, LS 51, LS 57 and LS 64
2 hole saw arbors: LSS 2 and LSS 4
1 pilot drill: LSB 6/90
1 LSA adapter for hole saw arbor LSS 4
1 Allen key, 4 mm
1 ejection spring

Dimensions [mm]	EAN 4007220		Description
219 x 180 x 66	319352	1	LS-SO 13 M

Hole saw arbors LSS

Hole saw arbors are designed for mounting the hole saw and the pilot drill.

Purpose of the ejection spring
It prevents the sawn-out material from becoming jammed between the inner walls of the hole saw and the drill. The spring force ejects the material. Should this effect not be required for a particular application, e.g. pipes that are already installed, the spring can easily be removed manually without the help of tools.



Ordering notes:
- Available in three sizes.
- Select the appropriate arbor, taking into account the hole saw diameter and available tool drive.
- Hole saw arbors LSS 1 and LSS 2 are supplied with the HSS pilot drill LSB 6/60 and an ejection spring.
- Hole saw arbors LSS 4 are supplied with the HSS pilot drill LSB 6/90 and an ejection spring.

Suitable for hole saws	d_2 [mm]	d_2 [inch]	Shank type	EAN 4007220	Thread		Description
LS 14–30	9.53	3/8	hexagonal	062630	1/2–20 UNF	1	LSS 1
LS 32–152	9.53	3/8	hexagonal	062647	5/8–18 UNF	1	LSS 2
LS 14–30	6.35	1/4	round	062661	1/2–20 UNF	1	LSS 4

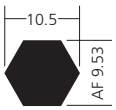
Shank shapes

The adjacent tables provide information on the arbor shapes and dimensions for the LSS hole saw arbors and LSB pilot drills. The matching hole saws and hole saw arbors are indicated.

PFERD hole saw arbor	Shank dia. [mm]	Shank dia. [inch]	Shank shape	For PFERD hole saws
LSS 1	9.53	3/8	⬢	LS 14 to LS 30
LSS 2	9.53	3/8	⬢	LS 32 to LS 152
LSS 4	6.35	1/4	▲	LS 14 to LS 30

Shank dimensions [mm]

Hexagonal



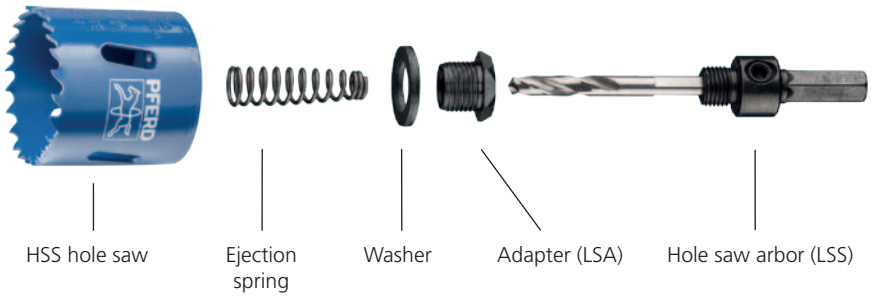
Round

PFERD pilot drill	Shank dia. [mm]	Shank dia. [inch]	Shank shape	For PFERD hole saw arbor
LSB 6/60	6.35	1/4	▲	LSS 1, LSS 2
LSB 6/90	6.35	1/4	▲	LSS 4

Ejection spring

All hole saw arbors are delivered with an ejection spring for better ejection of the sawn material.

Before using the tool, this ejection spring can be installed/removed without additional tools if required. Screw the ejection spring onto the drill from the side with the smaller diameter up to its limit. It is also possible to use the ejection spring with the LSA adapter and washer (see diagram).



PSL 11

AS-PSL 14-30

AS-PSL 32-152

Quick-mounting system for hole saws, adapter sets

PFERD offers a clamping system for easily and quickly using HSS hole saws. The quick-mounting system and the two three-part adapter sets, which have been tailored to the hole saw diameter, enable PFERD HSS hole saws to be used easily and conveniently on all conventional power drills.

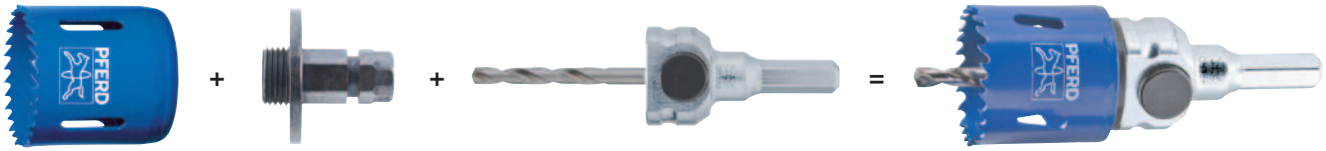
Advantages:
- Easily and quickly swap different hole saws.
- After the application is completed, the hole saw and quick-mounting system can be separated without the use of additional tools by simply pressing a button.
- Interchangeable HSS pilot drill.

Recommendations for use:
- Screw the adapters quickly and easily into the desired hole saw and clamp them in the quick-mounting system.

Ordering notes:
- Adapter set AS-PSL 14-30 is available for a hole saw diameter of 14–30 mm, and adapter set AS-PSL 32-152 is available for a hole saw diameter of 32–152 mm. Both adapter sets contain three adapters with the same dimensions.

Suitable for hole saws	Shank type	EAN 4007220	d_2 [mm]	d_2 [inch]		Description
LS 14–152	hexagonal	900185	11	7 1/16	1	PSL 11
LS 14–30	-	900215	-	-	1	AS-PSL 14-30
LS 32–152	-	900192	-	-	1	AS-PSL 32-152

Example combination



HSS hole saw LS 44 + Adapter from adapter set AS-PSL 32-152 + Quick-mounting system PSL 11 = LS 44 with adapter AS-PSL 32-152 and quick-mounting system PSL 11

LSB 6/60

LSB 6/90

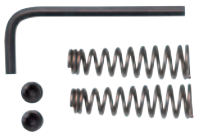
HSS pilot drill LSB

HSS pilot drills for HSS hole saw arbors and quick-mounting systems for hole saws.

Ordering notes:
- Hole saw arbors LSS 1 and LSS 2 are supplied with the HSS pilot drill LSB 6/60.
- Hole saw arbors LSS 4 are supplied with the HSS pilot drill LSB 6/90.
- The HSS pilot drill LSB 6/90 can be used for the quick-mounting system PSL 11.

Suitable for hole saws	Suitable arbors	d_2 [mm]	d_2 [inch]	Shank type	EAN 4007220		Description
LS 14–152	LSS 1, LSS 2	6.35	1/4	round	319284	1	LSB 6/60
	LSS 4	6.35	1/4	round	062708	1	LSB 6/90

Repair set for hole saw arbors



With the repair set for hole saw arbors, the most common parts can be replaced in case of loss or damage.

Contents:
2 ejection springs
2 hexagon socket head screws
1 hexagon socket wrench AF 4

EAN 4007220		Description
758953	1	RSL-5

LSA adapter

Hole saws LS 32 to LS 38 can be used with the LSA adapter, a washer and the hole saw arbors LSS 1 and LSS 4.

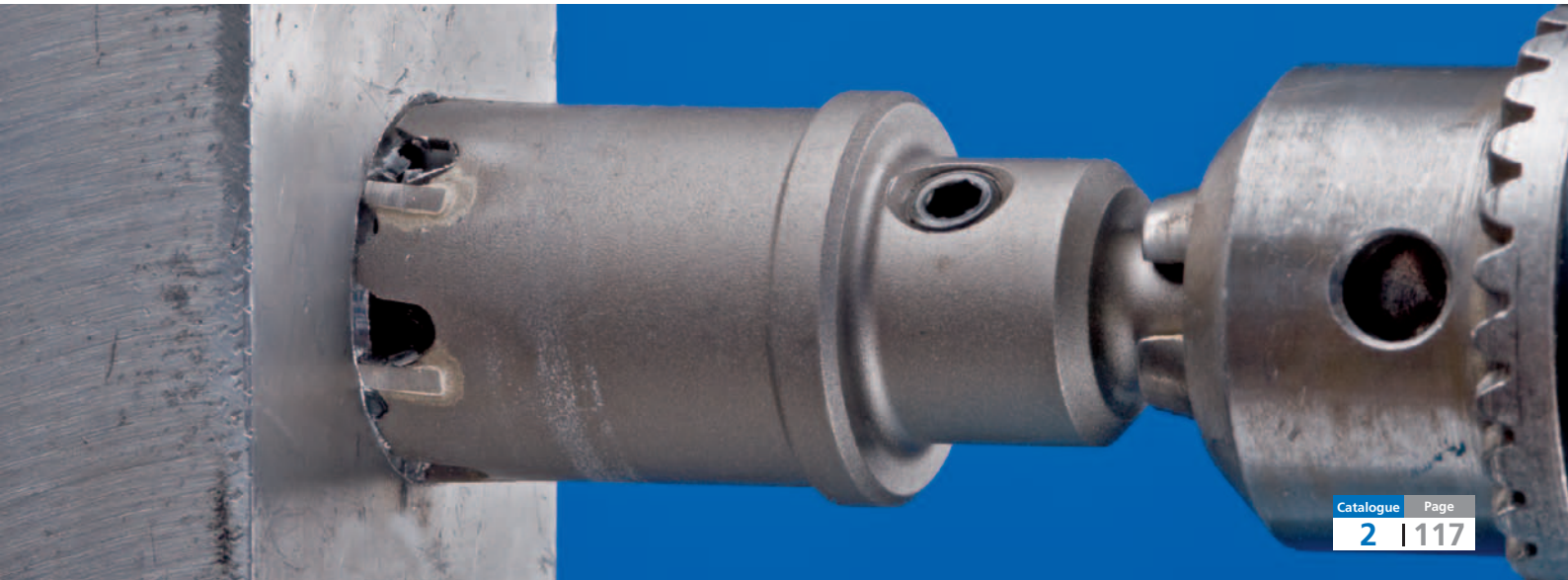
Suitable for hole saws	Suitable arbors	EAN 4007220		Description
LS 32–38	LSS 1, LSS 4	319291	1	LSA

Arbor extension for hole saws

The HSS hole saw arbors LSS 1 and LSS 2 can be extended using the arbor extension SVL-300.

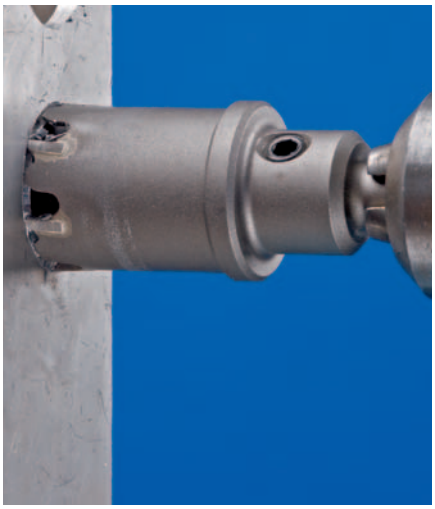
Advantages:
- Suitable for work on hard-to-reach components.
- Particularly suitable for work on hollow walls.
- Deep holes can be sawn easily.
- Achieves the required distance between the tool drive and the work area.
- Avoids damage to the workpiece and machine.
- Dust is not drawn into the tool drive during sawing.

Suitable arbors	Shank type	EAN 4007220	Hexagon socket d_1 [mm]	Hexagon socket d_1 [inch]	l_1 [mm]	l_1 [inch]	Width across flats (AF) d_2 [mm]		Description
LSS 1, LSS 2	hexagonal	798447	9.53	3/8	300	12	11	1	SVL-300



TC hole cutters and accessories
General information

Tungsten carbide hole cutters are professional tools for quick, precise hole-cutting (cut-outs) with a diameter of 16 to 105 mm. They are suitable for working on alloyed and non-alloyed steels, stainless steel (INOX), non-ferrous metals and plastics (including GRP). Tungsten carbide hole cutters are used on hand drills or on stationary machines.



Advantages:

- High concentricity, as the cutting head and shank are produced in one piece.
- Optimum cutting performance due to sharp teeth made of high-quality tungsten carbide.
- Interchangeable HSS pilot drill.

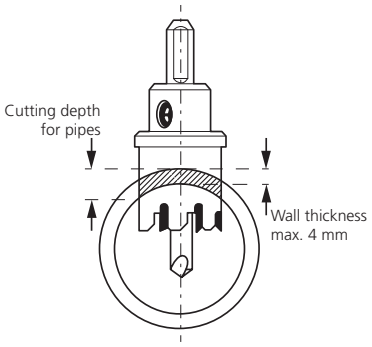
Ordering notes:

- 8 mm tool height (flat type) for work on sheets and flat materials, available in different diameters from 16 to 105 mm
- 35 mm tool height (long type) for work on pipes and curved surfaces, available in different diameters from 16 to 60 mm
- PFERD tungsten carbide hole cutters can be resharpened. Timely and professional resharpening substantially lengthens the tool life. Please contact your local sharpening service.
- Tungsten carbide hole cutters are supplied together with the pilot drill.

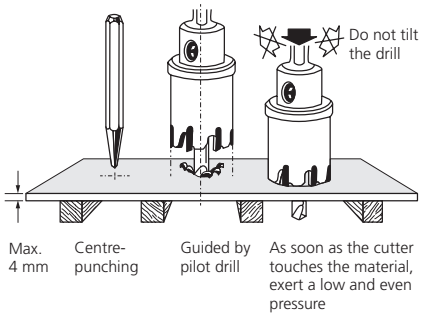
Recommendations for use:

- The stated reference rotational speed (see "Opt. RPM") apply to machines capable of providing roughly constant rotational speed under load. For low-power machines where speeds drop sharply under load, the rotational speed can be increased by about 30 %. If the teeth of the cutter are not continuously engaged (e.g. on pipes or curved surfaces), the recommended rotational speed levels may be increased by up to 100 %. This will help to prevent chatter and tooth breakage when using the cutter in manual applications.
- TC hole cutters are suitable for work on stainless steel (INOX).
- In order to avoid corrosion, remove any particles which develop during work from the workpiece. Clean the workpiece chemically or mechanically (etching/ polishing, etc.).

Pipes

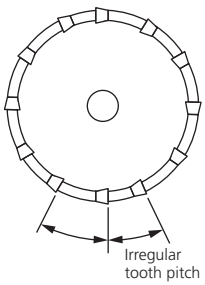


Flat materials
When working on sheets, leave an **unobstructed exit** for the hole cutter. Place supports **outside** the cutting area.



Tooth pitch:

PFERD hole cutters have an irregular tooth pitch (distance between teeth) to prevent tool chatter.



Shank shape and dimensions:

The table below shows information about the shank shape and the dimensions of the PFERD LOS hole cutter.

PFERD hole cutter	Hole cutter diameter	Shank diameter [mm]	Shank shape
LOS HM 1608 to LOS HM 2208	16 to 22 mm diameter	7	
LOS HM 2308 to LOS HM 5508	23 to 55 mm diameter	10	
LOS HM 6008 to LOS HM 10508	60 to 105 mm diameter	12	

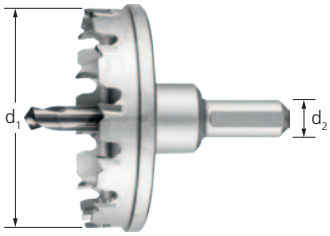
Safety notes:

= Wear eye protection!

= Observe the recommended rotational speed!

Flat type, tool height of 8 mm

The flat type (tool height 8 mm) is suitable for work on flat materials up to 4 mm in thickness.



d_1 [mm]	d_2 [mm]	EAN 4007220	Opt. RPM Steel	Opt. RPM Stainless steel (INOX)	Opt. RPM Non-ferrous metals	Opt. RPM Plastics	Matching drill		Description
16	7	062913	790–1,200	400–1,000	880–1,310	880–1,310	LOSB 6/48	1	LOS HM 1608
18	7	062937	710–1,060	350–880	780–1,170	780–1,170	LOSB 6/48	1	LOS HM 1808
19	7	062944	670–1,000	330–840	740–1,110	740–1,110	LOSB 6/48	1	LOS HM 1908
20	7	062951	630–950	320–800	700–1,050	700–1,050	LOSB 6/48	1	LOS HM 2008
21	7	062968	600–910	300–760	670–1,000	670–1,000	LOSB 6/48	1	LOS HM 2108
22	7	062975	580–870	290–720	640–950	640–950	LOSB 6/48	1	LOS HM 2208
23	10	062982	550–830	280–690	610–910	610–910	LOSB 6/48	1	LOS HM 2308
24	10	062999	530–800	270–660	580–880	580–880	LOSB 6/48	1	LOS HM 2408
25	10	063002	510–760	260–640	560–840	560–840	LOSB 6/48	1	LOS HM 2508
27	10	063026	470–710	240–590	520–780	520–780	LOSB 6/48	1	LOS HM 2708
28	10	063033	455–680	230–570	500–750	500–750	LOSB 6/48	1	LOS HM 2808
30	10	063057	425–635	210–530	470–700	470–700	LOSB 6/48	1	LOS HM 3008
32	10	063071	400–600	200–500	440–660	440–660	LOSB 6/48	1	LOS HM 3208
34	10	063095	375–560	185–470	410–620	410–620	LOSB 6/48	1	LOS HM 3408
35	10	063101	365–545	180–450	400–600	400–600	LOSB 6/48	1	LOS HM 3508
38	10	063132	335–505	170–420	370–550	370–550	LOSB 6/48	1	LOS HM 3808
40	10	063156	320–480	160–400	350–530	350–530	LOSB 6/48	1	LOS HM 4008
42	10	063170	305–455	150–380	330–500	330–500	LOSB 6/48	1	LOS HM 4208
43	10	063187	295–445	150–370	330–490	330–490	LOSB 6/48	1	LOS HM 4308
45	10	063200	285–425	140–355	310–470	310–470	LOSB 6/48	1	LOS HM 4508
48	10	063231	265–400	135–330	290–440	290–440	LOSB 6/48	1	LOS HM 4808
50	10	063255	255–380	125–320	280–420	280–420	LOSB 6/48	1	LOS HM 5008
52	10	063279	245–370	120–305	270–400	270–400	LOSB 6/48	1	LOS HM 5208
54	10	063293	235–355	120–295	260–390	260–390	LOSB 6/48	1	LOS HM 5408
55	10	063309	230–350	115–290	250–380	250–380	LOSB 6/48	1	LOS HM 5508
60	12	063354	210–320	105–265	230–350	230–350	LOSB 8/48	1	LOS HM 6008
65	12	063361	195–295	100–245	220–320	220–320	LOSB 8/48	1	LOS HM 6508
68	12	063378	190–280	95–235	210–310	210–310	LOSB 8/48	1	LOS HM 6808
70	12	063385	180–270	90–230	200–300	200–300	LOSB 8/48	1	LOS HM 7008
75	12	063392	170–255	85–215	190–280	190–280	LOSB 8/48	1	LOS HM 7508
80	12	063408	160–240	80–200	180–260	180–260	LOSB 8/48	1	LOS HM 8008
90	12	063422	140–210	70–180	160–230	160–230	LOSB 8/48	1	LOS HM 9008
100	12	063446	125–190	65–160	140–210	140–210	LOSB 8/48	1	LOS HM 10008
105	12	063453	120–180	60–150	130–200	130–200	LOSB 8/48	1	LOS HM 10508

Deep type, tool height of 35 mm

The long type (tool height 35 mm) is suitable for use on curved surfaces and pipe materials. The maximum cut depth is 32 mm.
Exception: LOS HM 6060:
maximum cut depth 57 mm

Ordering notes:
■ LOS HM 6060: Tool height 60 mm.

d_1 [mm]	d_2 [mm]	EAN 4007220	Opt. RPM Steel	Opt. RPM Stainless steel (INOX)	Opt. RPM Non-ferrous metals	Opt. RPM Plastics	Matching drill		Description
16	7	063491	790–1,200	400–1,000	880–1,310	880–1,310	LOSB 6/69	1	LOS HM 1635
17	7	063507	750–1,130	370–930	820–1,240	820–1,240	LOSB 6/69	1	LOS HM 1735
18	7	063514	710–1,060	350–880	780–1,170	780–1,170	LOSB 6/69	1	LOS HM 1835
19	7	063521	670–1,000	330–840	740–1,110	740–1,110	LOSB 6/69	1	LOS HM 1935
20	7	063538	630–950	320–800	700–1,050	700–1,050	LOSB 6/69	1	LOS HM 2035
21	7	063545	600–910	300–760	670–1,000	670–1,000	LOSB 6/69	1	LOS HM 2135
22	7	063552	580–870	290–720	640–950	640–950	LOSB 6/69	1	LOS HM 2235
24	10	063576	530–800	270–660	580–880	580–880	LOSB 8/69	1	LOS HM 2435
25	10	063583	510–760	260–640	560–840	560–840	LOSB 8/69	1	LOS HM 2535
26	10	063590	490–740	250–610	540–810	540–810	LOSB 8/69	1	LOS HM 2635
27	10	063606	470–710	240–590	520–780	520–780	LOSB 8/69	1	LOS HM 2735
28	10	063613	455–680	230–570	500–750	500–750	LOSB 8/69	1	LOS HM 2835
30	10	063637	425–635	210–530	470–700	470–700	LOSB 8/69	1	LOS HM 3035
32	10	063651	400–600	200–500	440–660	440–660	LOSB 8/69	1	LOS HM 3235
35	10	063682	365–545	180–450	400–600	400–600	LOSB 8/69	1	LOS HM 3535
38	10	063712	335–505	170–420	370–550	370–550	LOSB 8/69	1	LOS HM 3835
40	10	063736	320–480	160–400	350–530	350–530	LOSB 8/69	1	LOS HM 4035
42	10	063750	305–455	150–380	330–500	330–500	LOSB 8/69	1	LOS HM 4235
43	10	063767	295–445	150–370	330–490	330–490	LOSB 8/69	1	LOS HM 4335
45	10	063781	285–425	140–355	310–470	310–470	LOSB 8/69	1	LOS HM 4535
48	10	063811	265–400	135–330	290–440	290–440	LOSB 8/69	1	LOS HM 4835
50	10	063835	255–380	125–320	280–420	280–420	LOSB 8/69	1	LOS HM 5035
52	10	063842	245–370	120–305	270–400	270–400	LOSB 8/69	1	LOS HM 5235
55	10	063859	230–350	115–290	250–380	250–380	LOSB 8/69	1	LOS HM 5535
60	12	063866	210–320	105–265	230–350	230–350	LOSB 8/94	1	LOS HM 6060

HSS pilot drills for TC hole cutters

HSS pilot drill LOSB

The HSS pilot drill is replaceable.

Suitable for tungsten carbide hole cutter diameter [mm]	Tool height [mm]	EAN 4007220		Description
16–55	8	063873	1	LOSB 6/48
16–22	35	063880	1	LOSB 6/69
24–55	35	063903	1	LOSB 8/69
60	60	063910	1	LOSB 8/94
60–105	8	063897	1	LOSB 8/48