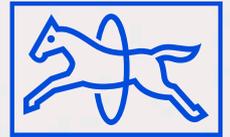


**PFERD**



**TOOLS**

2



# Milling, drilling and countersinking tools

### Milling, drilling and countersinking tools

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# Milling, drilling and countersinking tools

## Highlights from the PFERD TOOLS range



### Tungsten carbide burrs with high-performance cut ALU

Aluminium plays a crucial role in many industrial sectors. At the same time, machining of aluminium presents a number of challenges: Conventional cross cuts can become clogged very quickly, especially on soft aluminium alloys.



Unlike conventional cross cuts, burrs with the ALU cut feature a material-optimized tooth geometry. In combination with the high-quality HC-NFE coating, they prevent the formation of built-up edges and tool clogging.

#### Advantages:

- High stock removal rate combined with a smooth milling action on aluminium and special aluminium alloys, non-ferrous metals and plastics.
- HC-NFE coating prevents material adhesion when working on long-chipping and lubricating non-ferrous metals.
- Can be used with cutting speeds of up to 1,100 m/min (HC-NFE: up to 1,300 m/min).

2



### Milling tools for robot applications

PFERD TOOLS' impressive milling tools for robot applications meet the highest quality standards during production and offer high performance and wear resistance.



Our portfolio of products tailored specifically to the requirements of robot applications features innovative burr geometries which help to achieve significant process chain optimizations. The specially developed burr shapes such as KZW, KSK-WKN and SKM-ZYA combine the performance characteristics of various geometries in a single tool, enabling effortless chamfering and deburring in just one operation.

The result: Considerably reduced process costs due to fewer tool changes and significantly reduced programming effort.

#### Advantages:

- Less programming needed due to fewer tool changes.
- High-quality HICOAT coating for a much higher stock removal rate.

### HICOAT coating

PFERD TOOLS offers tools with HICOAT coatings to tackle particularly demanding applications. Three different coatings are available. The HICOAT coating HC-FEP is specifically designed for iron and steel materials. The HICOAT coating HC-ST5 is optimized for use on stainless steels. The HICOAT coating HC-NFE is mainly used for long-chipping and lubricating aluminium alloys and non-ferrous metals, as it prevents material adhesion. In general, all PFERD TOOLS tungsten carbide burrs are also available with HICOAT coatings.



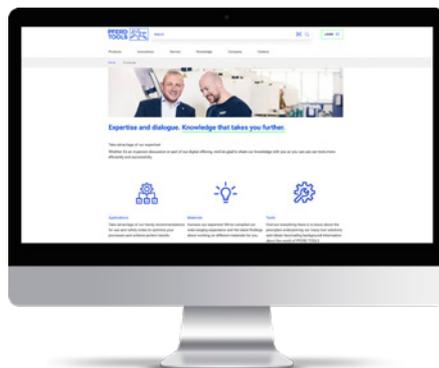
Scan the QR code to find out more about PFERD TOOLS' HICOAT coatings.

#### Advantages:

- Improved anti-adhesion characteristics.
- Effective chip discharge.
- Lower thermal loads.
- Increased tool life.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.

### More expert information online

Scan the QR code to find out a wide range of tool and application knowledge relating to PFERD TOOLS' high-quality tools and their huge variety of materials.



# Milling, drilling and countersinking tools

## General information



### Custom-made products

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 analyzing your task. Your specifications and wishes, drawings relating to cuts, shank diameters, special lengths, special shapes and coatings can thus be taken into account.



2



### Resharpener

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

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



### Robotics at PFERD TOOLS

To provide the best possible overview of our high-performance robotics range, we have marked all milling tools that are particularly well suited to robot-guided use with a pictogram.



In addition to the milling tools that have been specifically optimized for robot applications, selected coated tungsten carbide burrs with a shank diameter of 6 mm or more can also be used on the robot.

We are also happy to develop custom products for your robot applications. PFERD TOOLS has a long tradition of developing tools for robot applications. Our in-house research and development, along with our experienced application engineers, have successfully optimized numerous robotics applications around the world.



### Safety notes

- For safety reasons, the maximum permitted rotational speed indicated must never be exceeded.



Wear eye protection!



Wear hearing protection!



Wear a dust mask!



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



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



Observe the contact angle of 5–60° (ALUMASTER HSD-F)!



Tighten the bolts!



Do not use if damaged!



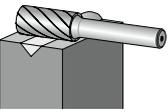
Do not use for cutting!



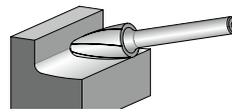
CE-marked

# Milling, drilling and countersinking tools

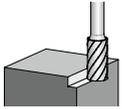
## Burr shapes



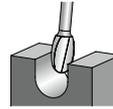
**ZYA**  
Cylindrical shape



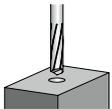
**RBF/HSS H**  
Tree shape with radius end



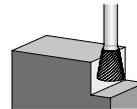
**ZYAS/HSS A-ST**  
Cylindrical shape with end cut



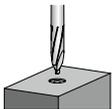
**TRE/HSS O**  
Oval shape



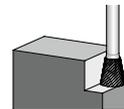
**ZYA BS**  
Cylindrical shape with drill cut



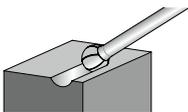
**WKN**  
Inverted cones



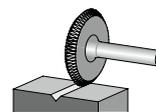
**ZYA ZBS**  
Cylindrical shape with centre drill



**WKNS/HSS W-ST**  
Inverted cones with end cut



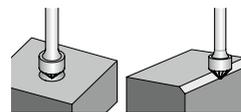
**KUD/HSS F**  
Ball shape



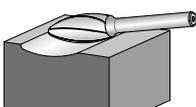
**N**  
Disc shape



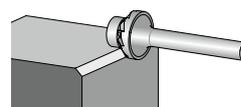
**WRC/HSS C**  
Cylindrical shape with radius end



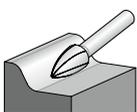
**KSK**  
Conical counterbore shape 90°



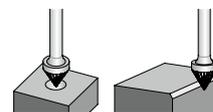
**B**  
Flame shape



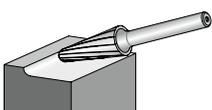
**KSK EDGE**  
EDGE 45°



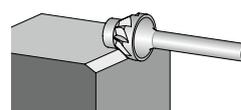
**SPG/ HSS K**  
Pointed tree shape



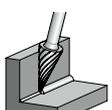
**KSJ**  
Conical counterbore shape 60°



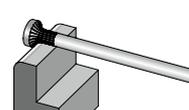
**KEL/HSS L**  
Conical shape with radius end



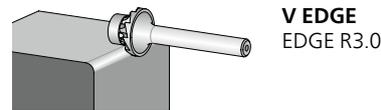
**KSJ EDGE**  
EDGE 30°



**SKM/HSS G**  
Conical pointed shape



**R**  
Radius burrs



2



## The quick way to find the perfect tool

Application	Material group			Used for	High-performance application	Universal application
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/mm <sup>2</sup> (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, tempering steels	Coarse stock removal	STEEL	3 PLUS
				Fine stock removal	ALLROUND	
		Hardened, heat-treated steels over 1,200 N/mm <sup>2</sup> (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	STEEL	3 PLUS
				Fine stock removal	ALLROUND	
	Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	INOX	4
				Fine stock removal	ALLROUND	
	Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	Coarse stock removal	ALU	1
				Fine stock removal	ALU	-
			Brass, copper, zinc	Coarse stock removal	NON-FERROUS	1
				Fine stock removal	ALLROUND	
		Hard non-ferrous metals	Bronze, titanium/titanium alloys, hard aluminium alloys (high Si content)	Coarse stock removal	TITANIUM	4
				Fine stock removal	ALU	
				Fine stock removal	NON-FERROUS	
				Fine stock removal	INOX	
High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)	Coarse stock removal	On request	4		
		Fine stock removal	MICRO	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 annealed cast iron EN-GJMB (GTS)	Coarse stock removal	CAST	3 PLUS	
			Fine stock removal	ALLROUND		
Milling out, machining contours	Plastics, other materials	Thermoplastics, fibre-reinforced plastics (GRP/CRP) with a fibre content ≤ 40%	Coarse stock removal	PLAST	-	
			Fine stock removal	FVK/FVKS		
Trimming, contour milling, cutting out holes	Thermoplastics, fibre-reinforced plastics (GRP/CRP) with a fibre content > 40%		Fine stock removal	ALU		
			Fine stock removal	NON-FERROUS		

## Special applications

Application	High-performance application	Universal application
Work on edges	TC burrs for work on edges EDGE FINISH system for work on edges	-
Problems with broken teeth	TC burrs – TOUGH, TOUGH-S cuts	HSS rotary cutters
Cutting out round holes	TC hole cutter	HSS step drills, HSS hole saws
Machining butt welds and fillet welds, work on edges/ chamfering using an angle grinder	<b>ALUMASTER</b> High Speed Disc	-
Machining butt welds and fillet welds, work on edges	High Speed Torus Cutter	-
Deburring and chamfering in a single step in robot applications	TC burrs KZW MICRO RS with HICOAT coating HC-FEP, TC burrs KZW cut 3 RS with HICOAT coating HC-FEP	-

## TC burrs

### PFERD TOOLS cuts

#### PFERD TOOLS cuts for universal applications



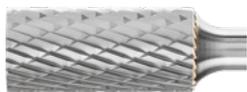
##### Cut 1 (C according to DIN 8033)

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



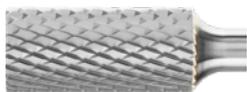
##### Cut 3 (MY according to DIN 8033)

- Machining of steel, cast iron, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal and good surfaces.
- Good surface.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.



##### Cut 3 PLUS (MX according to DIN 8033)

- Similar to the 3 cut, but with cross cut.
- Machining of steel, cast iron, stainless steel (INOX), nickel-based alloys and titanium alloys.
- High stock removal and good surfaces.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.



##### Cut 4 (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.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.



##### Cut 5 (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.
- Burrs with HICOAT coating HC-FEP for high hardness and wear resistance.

#### PFERD TOOLS cuts for high-performance applications



##### 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.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.



##### STEEL cut

- Extremely high stock removal rate on steel and cast steel.
- Smooth milling.
- Reduced vibration and less noise.
- Burrs with the HICOAT coating HC-FEP achieve a much higher stock removal rate than uncoated burrs.





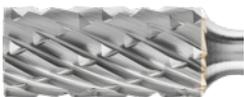
**INOX cut**

- Extremely high stock removal rate on all austenitic, rust and acid-resistant steels, stainless steel (INOX) and soft titanium alloys (tensile strength < 500 N/mm<sup>2</sup>).
- Significantly reduced vibration and less noise.
- Burrs with HICOAT coating HC-ST5 demonstrate high hardness and wear resistance in comparison with uncoated burrs.



**ALU cut**

- High stock removal rate on aluminium and aluminium alloys, non-ferrous metals and plastics.
- Smooth milling.
- High-quality HICOAT coating HC-NFE for long-chipping and smearing aluminium alloys and non-ferrous metals.
- Can be used with cutting speeds of up to 1,100 m/min (HC-NFE: up to 1,300 m/min).



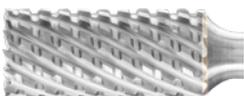
**NON-FERROUS cut**

- 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 tool life on hard titanium alloys.
- Tangibly more aggressive, large chips and very good chip removal.
- Reduced vibration and less noise.
- For soft titanium alloys (tensile strength < 500 N/mm<sup>2</sup>), PFERD TOOLS recommends the INOX cut.



**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.



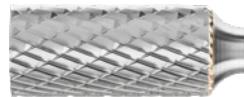
**FVK cut**

- 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.
- Generates smooth cut edges.
- For use on machines and robots with high feed rates.



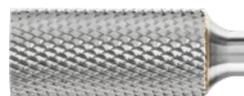
**TOUGH cut**

- 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.
- Burrs with HICOAT coating HC-FEP for high hardness and wear resistance.

**Note**

- On tungsten carbide burrs designed for high-performance applications, blue discolouration cannot be avoided on account of the very high stock removal rate. However, this does not constitute a safety risk.

# TC burrs

## General information



### Tungsten carbide burrs with a long shank

Tungsten carbide burrs with long shanks are particularly well suited to working in hard-to-reach areas. PFERD TOOLS 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. Additional variants can be custom-made on request. Tungsten carbide burrs with a long steel shank SL should only be used with rigid clamping systems and drives. There is a risk that they may break off!

In some applications, drive spindle extensions are an economic alternative to customized burrs with long shanks.

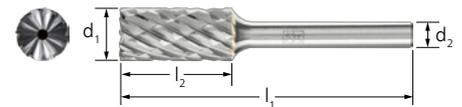


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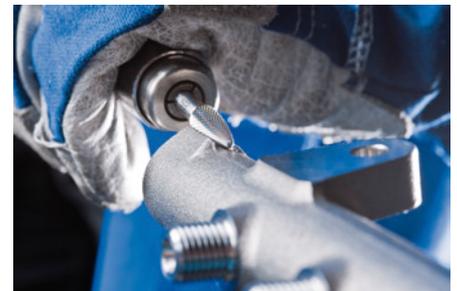
### Explanation of the code system

- $d_1$  = Burr dia.
- $l_2$  = Cut length
- $d_2$  = Shank dia.
- $l_1$  = Total length



### Recommendations for use

An optimum rotational speed and power output for the tool drive are required for cost-effective use of tungsten carbide burrs. Using tungsten carbide burrs on drives with an elastically mounted spindle significantly improves comfort when working. What's more, the grinder's elastically mounted spindle guarantees a longer tool life, especially when using tungsten carbide burrs. Scan the QR code to obtain more handy recommendations for use relating to milling work.



# TC burrs

## Cutting speeds – burrs for universal applications



### Recommended rotational speed range [RPM]

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

- ① Select the material group to be machined.
- ② Determine the type of application.
- ③ Select the cut.
- ④ Establish the cutting speed range.

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

- ③ Select the required burr diameter.
- ④ The cutting speed range and the burr diameter determine the recommended rotational speed range.



① Coarse stock removal			② Used for	③ Cut	④ Cutting speed			
Steel, cast steel	Steels up to 1,200 N/mm <sup>2</sup> (< 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, tempering steels	Coarse stock removal	1	600–900 m/min			
				3 PLUS	450–600 m/min			
			3 PLUS HC-FEP	450–750 m/min				
			Fine stock removal	5	450–600 m/min			
				5 HC-FEP	450–750 m/min			
	Hardened, heat-treated steels over 1,200 N/mm <sup>2</sup> (> 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	3	250–350 m/min			
				3 PLUS				
				4				
			Fine stock removal	3 HC-FEP	250–450 m/min			
				3 PLUS HC-FEP				
4 HC-FEP	250–450 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				
				3 HC-FEP	250–450 m/min			
				4				
			Fine stock removal	4 HC-FEP	250–600 m/min			
				5	350–450 m/min			
			5 HC-FEP	350–600 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
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 HC-FEP	450–750 m/min		
					4			
		Fine stock removal			3 HC-FEP	250–350 m/min		
				4 HC-FEP				
	High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)		Coarse stock removal	5	350–450 m/min		
					5 HC-FEP	350–600 m/min		
				Fine stock removal	3 PLUS	250–450 m/min		
4								
4 HC-FEP	250–600 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 annealed cast iron EN-GJMB (GTS)		Coarse stock removal	5 HC-FEP	350–750 m/min		
			1		600–900 m/min			
			Fine stock removal	3 PLUS	450–600 m/min			
				3	450–600 m/min			
			3 HC-FEP	450–750 m/min				

① Material group			② Used for	③ Cut	④ Cutting speed
Steel, cast steel	Steels up to 1,200 N/mm <sup>2</sup> (below 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, tempering steels	Coarse stock removal	ALLROUND	450–750 m/min
				ALLROUND HC-FEP	450–900 m/min
				STEEL	450–750 m/min
				STEEL HC-FEP	450–900 m/min
	Hardened, heat-treated steels over 1,200 N/mm <sup>2</sup> (over 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal	ALLROUND	250–450 m/min
				ALLROUND HC-FEP	250–600 m/min
				STEEL	450–750 m/min
				STEEL HC-FEP	450–900 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Coarse stock removal	ALLROUND	450–600 m/min
				INOX	450–600 m/min
			Fine stock removal	INOX HC-ST5	450–750 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys	Coarse stock removal	ALU	600–1,100 m/min
				ALU HC-NFE	600–1,300 m/min
			Fine stock removal	ALU	900–1,100 m/min
				ALU HC-NFE	900–1,300 m/min
				NON-FERROUS	450–600 m/min
		Brass, copper, zinc	Coarse stock removal	ALLROUND	450–750 m/min
				ALLROUND HC-FEP	450–900 m/min
				ALU	600–1,100 m/min
				ALU HC-NFE	600–1,300 m/min
			Fine stock removal	ALU	900–1,100 m/min
		ALU HC-NFE	900–1,300 m/min		
	Hard non-ferrous metals	Titanium/titanium alloys, hard aluminium alloys (high Si content)	Coarse stock removal	ALLROUND	450–600 m/min
				ALLROUND HC-FEP	450–750 m/min
				INOX	250–450 m/min
				INOX HC-ST5	250–600 m/min
		Hard titanium alloys	Coarse stock removal	TITANIUM	250–450 m/min
		Bronze	Coarse stock removal	ALLROUND	450–600 m/min
				ALLROUND HC-FEP	450–750 m/min
				ALU	600–900 m/min
				ALU HC-NFE	600–1,300 m/min
			NON-FERROUS	600–900 m/min	
Fine stock removal	ALU		900–1,100 m/min		
	ALU HC-NFE	900–1,300 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 annealed cast iron EN-GJMB (GTS)	Coarse stock removal	ALLROUND	450–900 m/min
				CAST	450–750 m/min
Plastics, other materials	Thermoplastics, Fibre-reinforced plastics (GRP/CRP)		Coarse stock removal	NON-FERROUS	600–1,100 m/min
				ALU	
				ALU HC-NFE	600–1,300 m/min
				PLAST	450–900 m/min
			FVK		
			Fine stock removal	ALU	600–1,100 m/min
				ALU HC-NFE	600–1,300 m/min
FVKS	450–900 m/min				



① Coarse stock removal			② Used for	③ Cut	④ Cutting speed			
Steel, cast steel	Steels up to 1,200 N/mm <sup>2</sup> (below 38 HRC)	Construction steels, carbon steels, tool steels, non-alloyed steels, case-hardened steels, cast steel, tempering steels	Coarse stock removal with impact load	TOUGH	250–600 m/min			
				TOUGH-S				
			Work on edges	3, 3 PLUS, SP	450–600 m/min			
				3 HC-FEP, 3 PLUS HC-FEP	450–750 m/min			
				EDGE	600–900 m/min			
	Fine stock removal	MICRO	600–750 m/min					
		MICRO HC-FEP	600–900 m/min					
	Hardened, heat-treated steels over 1,200 N/mm <sup>2</sup> (over 38 HRC)	Tool steels, tempering steels, alloyed steels, cast steel	Coarse stock removal with impact load	TOUGH	250–350 m/min			
				TOUGH-S				
			Work on edges	3, 3 PLUS, SP	250–350 m/min			
3 HC-FEP, 3 PLUS HC-FEP				250–450 m/min				
5				350–450 m/min				
5 HC-FEP				350–600 m/min				
EDGE				600–750 m/min				
Fine stock removal			MICRO	450–600 m/min				
			MICRO HC-FEP	450–750 m/min				
Stainless steel (INOX)			Rust and acid-resistant steels	Austenitic and ferritic stainless steels	Work on edges	3, 3 PLUS, SP	250–350 m/min	
	3 HC-FEP, 3 PLUS HC-FEP	250–450 m/min						
	5	350–450 m/min						
	Fine stock removal	MICRO			450–600 m/min			
		MICRO HC-FEP			450–750 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	Work on edges	3, 3 PLUS, SP	600–900 m/min			
				3 HC-FEP, 3 PLUS HC-FEP	600–1,100 m/min			
				EDGE ALU	900–1,100 m/min			
				EDGE	600–900 m/min			
	Hard non-ferrous metals	Bronze, hard aluminium alloys (high Si content)	Work on edges	3, 3 PLUS	250–450 m/min			
				3 HC-FEP, 3 PLUS HC-FEP	250–600 m/min			
				EDGE ALU	900–1,100 m/min			
				EDGE	250–450 m/min			
		Titanium/titanium alloys	Work on edges	MICRO	450–600 m/min			
				MICRO HC-FEP	450–750 m/min			
			Fine stock removal	SP	250–450 m/min			
				EDGE				
	High-temperature-resistant materials	Nickel-based and cobalt-based alloys (engine and turbine construction)	Work on edges	5	350–600 m/min			
				5 HC-FEP	350–750 m/min			
EDGE				250–450 m/min				
Fine stock removal			MICRO	450–600 m/min				
			MICRO HC-FEP	450–750 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 annealed cast iron EN-GJMB (GTS)	Coarse stock removal with impact load	TOUGH	250–600 m/min
							TOUGH-S	
Work on edges	3, 3 PLUS, SP	450–600 m/min						
	3 HC-FEP, 3 PLUS HC-FEP	450–750 m/min						
	Fine stock removal	MICRO	600–750 m/min					
	MICRO HC-FEP	600–900 m/min						
Plastics, other materials	Fibre-reinforced plastics (GRP/CRP), thermoplastics	Work on edges	EDGE ALU	750–1,100 m/min				

# TC burrs

## Rotational speeds

### Example:

TC burr,  
ALLROUND cut,  
Burr dia. 12 mm.  
Coarse stock removal on steels up to  
1,200 N/mm<sup>2</sup>.  
Cutting speed: 450–750 m/min  
**Rotational speed range:**  
**12.000–20.000 RPM**

⑤ Burr dia. [mm]	⑥ Cutting speeds [m/min]							
	250	350	450	600	750	900	1,100	1,300
	Rotational speeds [RPM]							
1.5	53,000	74,000	95,000	127,000	159,000	191,000	233,000	275,000
2	40,000	56,000	72,000	95,000	119,000	143,000	175,000	206,000
3	27,000	37,000	48,000	64,000	80,000	95,000	117,000	138,000
4	20,000	28,000	36,000	48,000	60,000	72,000	88,000	104,000
5	16,000	22,000	29,000	40,000	48,000	57,000	70,000	83,000
6	13,000	19,000	24,000	32,000	40,000	48,000	59,000	70,000
8	10,000	14,000	18,000	24,000	30,000	36,000	44,000	52,000
10	8,000	11,000	14,000	19,000	24,000	29,000	35,000	41,000
12	7,000	9,000	12,000	16,000	20,000	24,000	30,000	34,000
13	6,000	9,000	11,000	15,000	22,500	22,000	27,000	32,000
16	5,000	7,000	9,000	12,000	15,000	18,000	22,000	26,000
20	4,000	6,000	7,000	10,000	12,000	14,000	17,000	20,000
25	3,000	4,000	6,000	8,000	10,000	11,000	13,000	16,000



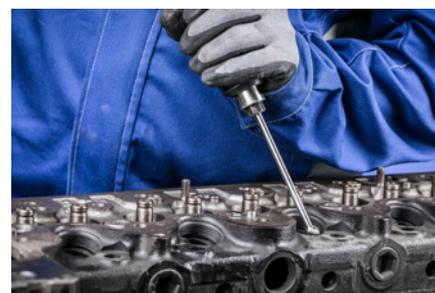
## Tungsten carbide burrs with long shanks

Tungsten carbide burrs with long shanks are particularly well suited to working in hard-to-reach areas. PFERD TOOLS 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. Tungsten carbide burrs with the designation GL 75 mm are made from solid carbide, which means they can only be shortened using diamond tools. Additional variants can be custom-made on request.

### Safety notes:

- Tungsten carbide burrs with a long steel shank SL should only be used with rigid clamping systems and drives. There is a risk that they may break off.

- When working with long shank lengths, it is crucial that the tool 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 burr failure (bending) and hence an increased risk of accidents. If continuous contact between the tool and the workpiece is not guaranteed, the ⑥ maximum idling speeds stated in the table must not be exceeded.



- For safety reasons, the maximum application speeds ⑦ with contact with the workpiece require a reduction in the recommended rotational speed of tungsten carbide burrs with standard shanks. The reduced rotational speeds are stated in the table below.

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

- ① Select the required burr diameter.
- ⑦ 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,  
cut 3 PLUS,  
burr dia. 12 mm.  
Coarse stock removal on steels up to  
1,200 N/mm<sup>2</sup>.

**Maximum application speed with contact with the workpiece: 7,000 RPM**

① Burr dia. [mm]	⑧ Maximum idling speed [RPM] without contact with the workpiece		⑦ Maximum application speed [RPM] with contact with the workpiece	
	Shank length [mm]			
	75	150	75	150
3	10,000	-	31,000	-
6	6,000	8,000	15,000	15,000
8	-	6,000	-	11,000
10	-	4,000	-	9,000
12	-	3,000	-	7,000

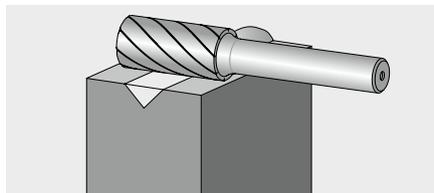
# TC burrs for universal applications

For fine and coarse stock removal



## Cylindrical shape ZYA without end cut

Cylindrical burrs according to DIN 8032 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

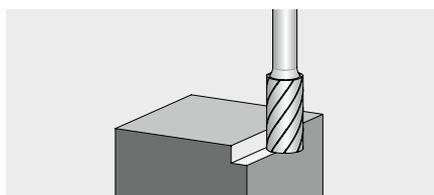
- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
4	13	6	55	3 PLUS	1	21101526	ZYA 0413/6 Z3 PLUS
6	16	6	55	3 PLUS	1	21101626	ZYA 0616/6 Z3 PLUS
8	20	6	60	3 PLUS	1	21101726	ZYA 0820/6 Z3 PLUS
10	13	6	53	3 PLUS	1	21101826	ZYA 1013/6 Z3 PLUS
	20	6	60	3 PLUS	1	21102126	ZYA 1020/6 Z3 PLUS
12	25	6	65	3 PLUS	1	21101926	ZYA 1225/6 Z3 PLUS
				5	1	21101956	ZYA 1225/6 Z5
16	25	6	65	3 PLUS	1	21102026	ZYA 1625/6 Z3 PLUS
4.8	15.9	6.35	49.21	3 PLUS	1	21724022	ZYA 4,8x15,9x6,35 Z3P
6.35	15.9	6.35	49.21	3 PLUS	1	21724032	ZYA 6,35x15,9x6,35 Z3P
7.9	19	6.35	63.5	3 PLUS	1	21724052	ZYA 7,9x19x6,35 Z3P
9.5	19	6.35	63.5	3 PLUS	1	21724062	ZYA 9,5x19x6,35 Z3P
12.7	25.4	6.35	69.85	3 PLUS	1	21724102	ZYA 12,7x25,4x6,35 Z3P
15.9	25.4	6.35	69.85	3 PLUS	1	21724112	ZYA 15,9x25,4x6,35 Z3P
19.1	25.4	6.35	69.85	3 PLUS	1	21724122	ZYA 19x25,4x6,35 Z3P
25.4	25.4	6.35	69.85	3 PLUS	1	21724162	ZYA 25,4x25,4x6,35 Z3P
9.5	19	6.35	168.28	3 PLUS	1	21725812	ZYA 9,5x19x6,35-150 Z3P
12.7	25.4	6.35	174.63	3 PLUS	1	21725822	ZYA 12,7x25,4x6,35-150 Z3P



## Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

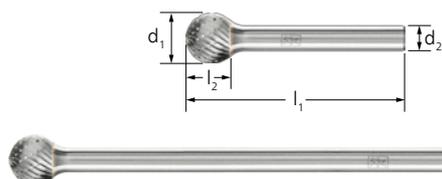
d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
2	10	3	40	5	1	21200153	ZYAS 0210/3 Z5
3	13	3	43	3 PLUS	1	21200283	ZYAS 0313/3 Z3 PLUS
				5	1	21200253	ZYAS 0313/3 Z5
6	7	3	37	3 PLUS	1	21200383	ZYAS 0607/3 Z3 PLUS
				5	1	21200353	ZYAS 0607/3 Z5
	13	3	43	3 PLUS	1	21200483	ZYAS 0613/3 Z3 PLUS
				5	1	21200453	ZYAS 0613/3 Z5
16	6	55	3 PLUS	1	21100226	ZYAS 0616/6 Z3 PLUS	
8	20	6	60	3 PLUS	1	21100326	ZYAS 0820/6 Z3 PLUS
10	20	6	60	3 PLUS	1	21100726	ZYAS 1020/6 Z3 PLUS

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# TC burrs for universal applications

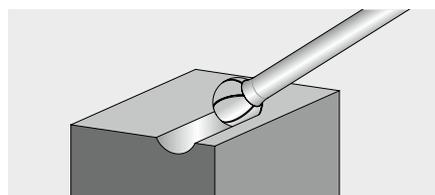
For fine and coarse stock removal

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
12	25	6	65	3 PLUS	1	21100526	ZYAS 1225/6 Z3 PLUS
16	25	6	65	3 PLUS	1	21100626	ZYAS 1625/6 Z3 PLUS
6.35	15.9	6.35	49.21	3 PLUS	1	21724212	ZYAS 6,35x15,9x6,35 Z3P
7.9	19	6.35	63.5	3 PLUS	1	21724232	ZYAS 7,9x19x6,35 Z3P
12.7	25.4	6.35	69.85	3 PLUS	1	21724282	ZYAS 12,7x25,4x6,35 Z3P
15.9	25.4	6.35	69.85	3 PLUS	1	21724292	ZYAS 15,9x25,4x6,35 Z3P



## Ball shape KUD

Ball-shaped burr according to DIN 8032 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
3	2	3	33	3 PLUS	1	21211083	KUD 0302/3 Z3 PLUS
				5	1	21211053	KUD 0302/3 Z5
4	3	3	34	3 PLUS	1	21212583	KUD 0403/3 Z3 PLUS
				5	1	21212553	KUD 0403/3 Z5
6	5	3	35	3 PLUS	1	21213083	KUD 0605/3 Z3 PLUS
4	3	6	45	3 PLUS	1	21112026	KUD 0403/6 Z3 PLUS
6	5	6	45	3 PLUS	1	21112526	KUD 0605/6 Z3 PLUS
8	7	6	47	3 PLUS	1	21112626	KUD 0807/6 Z3 PLUS
10	9	6	49	3 PLUS	1	21112726	KUD 1009/6 Z3 PLUS
12	10	6	51	3 PLUS	1	21112826	KUD 1210/6 Z3 PLUS
16	14	6	54	3 PLUS	1	21112926	KUD 1614/6 Z3 PLUS
20	18	6	58	3 PLUS	1	21113026	KUD 2018/6 Z3 PLUS
4.8	3.17	6.35	49.21	3 PLUS	1	21724532	KUD 4,8x3,17x6,35 Z3P
6.35	4.8	6.35	49.21	3 PLUS	1	21724542	KUD 6,35x4,8x6,35 Z3P
7.9	6.35	6.35	52.39	3 PLUS	1	21724552	KUD 7,9x6,35x6,35 Z3P
9.5	7.9	6.35	52.39	3 PLUS	1	21724562	KUD 9,5x7,9x6,35 Z3P
12.7	11.1	6.35	55.56	3 PLUS	1	21724582	KUD 12,7x11,1x6,35 Z3P
15.9	14.3	6.35	58.74	3 PLUS	1	21724592	KUD 15,9x14,3x6,35 Z3P
19.1	17.4	6.35	71.44	3 PLUS	1	21724602	KUD 19x17,4x6,35 Z3P
12.7	11.1	6.35	160	3 PLUS	1	21725942	KUD 12,7x11,1x6,35-150 Z3P

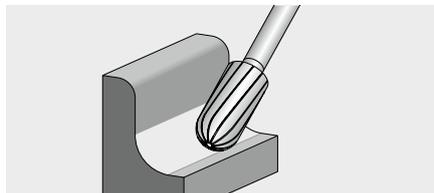
# TC burrs for universal applications

For fine and coarse stock removal



## Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

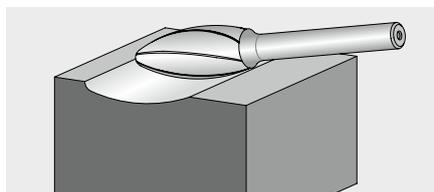
- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
3	13	3	43	3 PLUS	1	21205183	WRC 0313/3 Z3 PLUS
				5	1	21205153	WRC 0313/3 Z5
6	13	3	43	3 PLUS	1	21205283	WRC 0613/3 Z3 PLUS
				5	1	21205253	WRC 0613/3 Z5
	16	6	55	3 PLUS	1	21105026	WRC 0616/6 Z3 PLUS
				5	1	21105056	WRC 0616/6 Z5
8	20	6	60	3 PLUS	1	21105126	WRC 0820/6 Z3 PLUS
10	20	6	60	3 PLUS	1	21105226	WRC 1020/6 Z3 PLUS
	25	6	65	3 PLUS	1	21105526	WRC 1025/6 Z3 PLUS
12	25	6	65	3 PLUS	1	21105326	WRC 1225/6 Z3 PLUS
16	25	6	65	3 PLUS	1	21105426	WRC 1625/6 Z3 PLUS
4.8	15.9	6.35	49.21	3 PLUS	1	21724382	WRC 4,8x15,9x6,35 Z3P
6.35	15.9	6.35	49.21	3 PLUS	1	21724392	WRC 6,35x15,9x6,35 Z3P
7.9	19	6.35	63.5	3 PLUS	1	21724412	WRC 7,9x19x6,35 Z3P
9.5	19	6.35	63.5	3 PLUS	1	21724422	WRC 9,5x19x6,35 Z3P
12.7	25.4	6.35	69.85	3 PLUS	1	21724462	WRC 12,7x25,4x6,35 Z3P
15.9	25.4	6.35	69.85	3 PLUS	1	21724472	WRC 15,9x25,4x6,35 Z3P
19.1	25.4	6.35	69.85	3 PLUS	1	21724482	WRC 19x25,4x6,35 Z3P
9.5	19	6.35	168.28	3 PLUS	1	21725872	WRC 9,5x19x6,35-150 Z3P
12.7	25.4	6.35	174.63	3 PLUS	1	21725882	WRC 12,7x25,4x6,35-150 Z3P



## Flame-shaped B

Flame-shaped burr according to ISO 7755/8 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



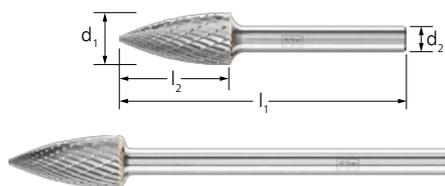
### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
3	7	3	37	0.8	5	1	21202553	B 0307/3 Z5
6	13	3	43	1	5	1	21203653	B 0613/3 Z5
8	20	6	60	1.5	3 PLUS	1	21103126	B 0820/6 Z3 PLUS
12	30	6	70	2.1	3 PLUS	1	21103326	B 1230/6 Z3 PLUS
7.9	19	6.35	63.5	1.5	3 PLUS	1	21724872	B 7,9x19x6,35 Z3P
12.7	31.7	6.35	76.2	2.1	3 PLUS	1	21724882	B 12,7x31,7x6,35 Z3P

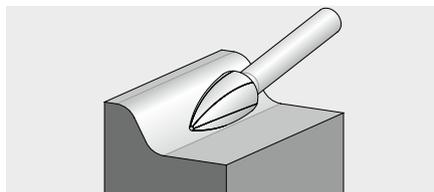
# TC burrs for universal applications

For fine and coarse stock removal



## Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032 with cut conforming to DIN 8033 and flattened tip for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

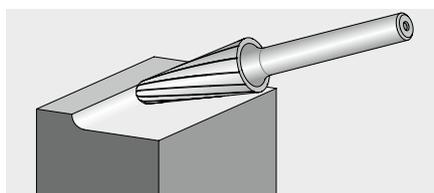
- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
3	7	3	37	5	1	21222553	SPG 0307/3 Z5
	13	3	43	5	1	21222653	SPG 0313/3 Z5
6	13	3	43	3 PLUS	1	21222783	SPG 0613/3 Z3 PLUS
	18	6	55	3 PLUS	1	21122526	SPG 0618/6 Z3 PLUS
10	20	6	60	3 PLUS	1	21122626	SPG 1020/6 Z3 PLUS
12	25	6	65	3 PLUS	1	21122726	SPG 1225/6 Z3 PLUS
6.35	15.9	6.35	49.21	3 PLUS	1	21724782	SPG 6,35x15,9x6,35 Z3P
9.5	19	6.35	63.5	3 PLUS	1	21724802	SPG 9,5x19x6,35 Z3P
12.7	25.4	6.35	69.85	3 PLUS	1	21724812	SPG 12,7x25,4x6,35 Z3P



## Conical shape with radius end KEL

Conical burr with round radius end according to DIN 8032 and cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	$r$ [mm]	Cut		Item no.	Designation
8	20	6	60	16	1.25	3 PLUS	1	21124996	KEL 0820/6 Z3 PLUS
10	20	6	60	14	2.9	3 PLUS	1	21125026	KEL 1020/6 Z3 PLUS
12	25	6	65	14	3.3	3 PLUS	1	21125126	KEL 1225/6 Z3 PLUS
	30	6	70	14	2.6	3 PLUS	1	21125226	KEL 1230/6 Z3 PLUS
16	30	6	70	14	4.8	3 PLUS	1	21125326	KEL 1630/6 Z3 PLUS
7.9	25.4	6.35	71.44	16	1.25	3 PLUS	1	21725142	KEL 8,3x25,8x6,35 Z3P
9.5	26.9	6.35	76.2	14	2.9	3 PLUS	1	21725152	KEL 9,9x30,3x6,35 Z3P
12.7	28.6	6.35	77.79	14	3.3	3 PLUS	1	21725162	KEL 12,7x28,6x6,35 Z3P
15.9	33.3	6.35	82.55	14	4.8	3 PLUS	1	21725182	KEL 15,9x33,3x6,35 Z3P
9.5	26.9	6.35	180.98	14	2.9	3 PLUS	1	21726222	KEL 9,5x28,6x6,35-150 Z3P

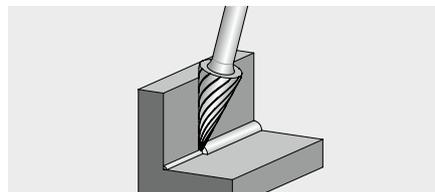
# TC burrs for universal applications

For fine and coarse stock removal



## Conical pointed shape SKM

Conical pointed burr according to DIN 8032 with cut conforming to DIN 8033 and flattened tip for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

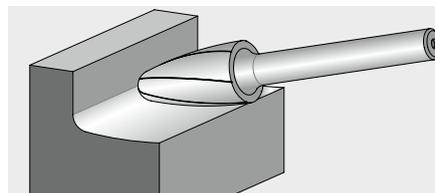
- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Cut		Item no.	Designation
3	7	3	37	21	5	1	21214053	SKM 0307/3 Z5
6	13	3	43	25	5	1	21215053	SKM 0613/3 Z5
	18	6	55	18	3 PLUS	1	21115026	SKM 0618/6 Z3 PLUS
10	20	6	60	28	3 PLUS	1	21115126	SKM 1020/6 Z3 PLUS
12	25	6	65	26	3 PLUS	1	21115226	SKM 1225/6 Z3 PLUS
6.35	19	6.35	49.21	14	3 PLUS	1	21725212	SKM 6,35x19x6,35 Z3P
9.5	19	6.35	63.5	28	3 PLUS	1	21725232	SKM 9,5x19x6,35 Z3P
12.7	25.4	6.35	69.85	28	3 PLUS	1	21725242	SKM 12,7x25,4x6,35 Z3P



## Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



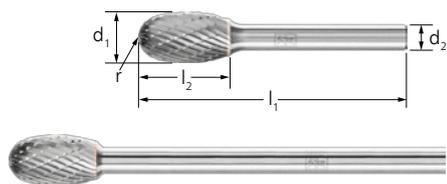
### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
3	7	3	37	0.75	5	1	21217553	RBF 0307/3 Z5
6	13	3	43	1.5	3 PLUS	1	21230083	RBF 0613/3 Z3 PLUS
	18	6	55	1.5	5	1	21230053	RBF 0613/3 Z5
3 PLUS					1	21117326	RBF 0618/6 Z3 PLUS	
8	20	6	60	1.2	5	1	21117356	RBF 0618/6 Z5
					3 PLUS	1	21117626	RBF 0820/6 Z3 PLUS
10	20	6	60	2.5	3 PLUS	1	21117726	RBF 1020/6 Z3 PLUS
					5	1	21117756	RBF 1020/6 Z5
12	25	6	65	2.5	3 PLUS	1	21117826	RBF 1225/6 Z3 PLUS
16	30	6	70	3.6	3 PLUS	1	21117926	RBF 1630/6 Z3 PLUS
6.35	15.9	6.35	49.21	1.5	3 PLUS	1	21724692	RBF 6,35x15,9x6,35 Z3P
9.5	19	6.35	63.5	2.5	3 PLUS	1	21724702	RBF 9,5x19x6,35 Z3P
12.7	19	6.35	63.5	3.2	3 PLUS	1	21724732	RBF 12,7x19x6,35 Z3P
	25.4	6.35	69.85	0.45	3 PLUS	1	21724722	RBF 12,7x25,4x6,35 Z3P
15.9	25.4	6.35	69.85	3.6	3 PLUS	1	21724742	RBF 15,9x25,4x6,35 Z3P
9.5	19	6.35	171.45	2.5	3 PLUS	1	21726052	RBF 9,5x19x6,35-150 Z3P
12.7	25.4	6.35	174.63	3.2	3 PLUS	1	21726062	RBF 12,7x25,4x6,35-150 Z3P

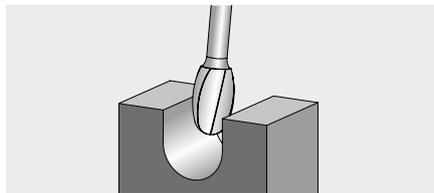
# TC burrs for universal applications

For fine and coarse stock removal



## Oval shape TRE

Oval burr according to DIN 8032 with cut conforming to DIN 8033 for general use on all materials. A good stock removal rate is achieved through optimum matching of tungsten carbide, geometry, cut and available coating.



### Special features:

- Long tool life and high surface quality.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.
- Also available with the high-quality HICOAT coating for a much higher stock removal rate.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
3	7	3	37	1.2	3 PLUS	1	21210083	TRE 0307/3 Z3 PLUS
					5	1	21210053	TRE 0307/3 Z5
6	10	3	40	2.8	5	1	21235053	TRE 0610/3 Z5
		6	50	2.8	3 PLUS	1	21134826	TRE 0610/6 Z3 PLUS
8	13	6	53	3.7	3 PLUS	1	21135026	TRE 0813/6 Z3 PLUS
10	16	6	56	4	3 PLUS	1	21134926	TRE 1016/6 Z3 PLUS
12	20	6	60	5	3 PLUS	1	21135126	TRE 1220/6 Z3 PLUS
6.35	9.5	6.35	49.21	2.8	3 PLUS	1	21724632	TRE 6,35x9,5x6,35 Z3P
9.5	15.9	6.35	60.33	4	3 PLUS	1	21724642	TRE 9,5x15,9x6,35 Z3P
12.7	22.2	6.35	66.68	5	3 PLUS	1	21724652	TRE 12,7x22,2x6,35 Z3P
6.35	9.5	6.35	161.92	2.8	3 PLUS	1	21725982	TRE 6,35x9,5x6,35-150 Z3P



## Set 1501 cut 5

Set 1501 – cut 5 – contains 15 small tungsten carbide burrs in the most common shapes and dimensions for general applications.

### Contents:

The set comprises one each of the following: ZYAS 0210/3 Z5, ZYAS 0313/3 Z5, ZYAS 0607/3 Z5, ZYAS 0613/3 Z5, B 0307/3 Z5, KUD 0403/3 Z5, WRC 0210/3 Z5, WRC 0313/3 Z5, SPG 0307/3 Z5, SKM 0613/3 Z5, RBF 0307/3 Z5, RBF 0613/3 Z5, TRE 0307/3 Z5, TRE 0610/3 Z5 and WKNS 0307/3 Z5 with a shank diameter of 3 mm, cut 5.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
5	1	21901501	SET 1501 Z5 15TLG



# TC burrs for universal applications

For fine and coarse stock removal



## Set 1511 cut 3 PLUS

The set contains five tungsten carbide burrs with cut 3 PLUS in the most common shapes and dimensions for general applications.

### Contents:

The set comprises one each of the following: ZYA 6.35x15.9x6.35 Z3P, WRC 6.35x15.9x6.35 Z3P, WRC 12.7x25.4x6.35 Z3P, RBF 12.7x25.4x6.35 Z3P and SPG 9.5x19x6.35 Z3P.

- The burrs are secured at the shanks, facilitating the selection and withdrawal of the tools.
- Five further unused slots are available for other burrs.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
3 PLUS	1	26005693	SET 1511 INCH Z3P 5TLG



## Set 1510 cut 3 PLUS

The set contains 10 tungsten carbide burrs with cut 3 PLUS in the most common shapes and dimensions for general applications.

### Contents:

The set comprises one each of the following: ZYA 6.35x15.9x6.35 Z3P, ZYA 9.5x19x6.35 Z3P, WRC 6.35x15.9x6.35 Z3P, WRC 9.5x19x6.35 Z3P, WRC 12.7x25.4x6.35 Z3P, KUD 9.5x7.9x6.35 Z3P, TRE 9.5x7.9x6.35 Z3P, RBF 6.35x15.9x6.35 Z3P,

RBF 12.7x25.4x6.35 Z3P and SPG 9.5x19x6.35 Z3P.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
3 PLUS	1	26005694	SET 1510 INCH Z3P 10TLG



## Set 1508 cut 3 PLUS

The set contains 10 tungsten carbide burrs in the most common shapes and dimensions for general applications.

### Contents:

The set comprises one each of the following: ZYA 1020/6 Z3 PLUS, ZYA 1225/6 Z3 PLUS, WRC 0616/6 Z3 PLUS, WRC 1025/6 Z3 PLUS, WRC 1225/6 Z3 PLUS, RBF 0618/6 Z3 PLUS, RBF 1020/6 Z3 PLUS, RBF 1225/6 Z3 PLUS, KEL 1020/6 Z3 PLUS and TRE 1220/6 Z3 PLUS with a shank diameter of 6 mm, cut Z3 PLUS.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
3 PLUS	1	26005691	SET 1508 Z3P 10TLG

# TC burrs for universal applications

For fine and coarse stock removal



## Set 1509 cut 3 PLUS

The set contains five tungsten carbide burrs in the shapes and dimensions most commonly used in the workshop.

### Contents:

The set comprises one each of the following: ZYA 1020/6 Z3 PLUS, WRC 1025/6 Z3 PLUS, WRC 1225/6 Z3 PLUS, RBF 1020/6 Z3 PLUS and TRE 1220/6 Z3 PLUS with a shank diameter of 6 mm, cut Z3 PLUS.

### Special features:

- The sturdy plastic box protects the tools against 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.

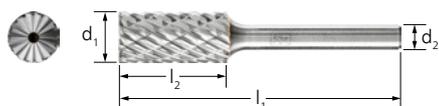
2



Cut		Item no.	Designation
3 PLUS	1	26005692	SET 1509 Z3P 5TLG

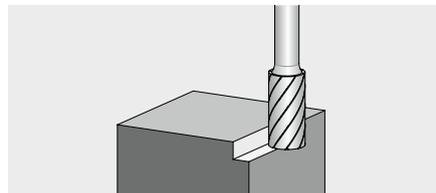
# TC burrs for high-performance applications

ALLROUND cut for versatile use



## Cylindrical shape ZYAS with end cut

Cylindrical burrs according to DIN 8032 with circumferential and end cut for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

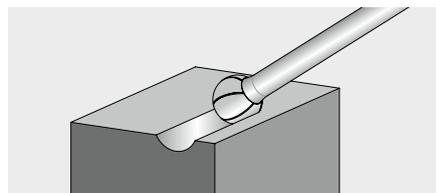
- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	ALLROUND	1	21001000	ZYAS 0616/6 ALLROUND
10	20	6	60	ALLROUND	1	21001002	ZYAS 1020/6 ALLROUND
12	25	6	65	ALLROUND	1	21001003	ZYAS 1225/6 ALLROUND
6.35	15.9	6.35	49.21	ALLROUND	1	21728029	ZYAS 6,35x15,9x6,35 ALLROUND
9.5	19	6.35	63.5	ALLROUND	1	21728019	ZYAS 9,5x19x6,35 ALLROUND
12.7	25.4	6.35	69.85	ALLROUND	1	21728010	ZYAS 12,7x25,4x6,35 ALLROUND



## Ball shape KUD

Ball-shaped burr according to DIN 8032 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	5	6	45	ALLROUND	1	21001005	KUD 0605/6 ALLROUND
10	9	6	49	ALLROUND	1	21001007	KUD 1009/6 ALLROUND
12	10	6	51	ALLROUND	1	21001008	KUD 1210/6 ALLROUND
6.35	4.8	6.35	49.21	ALLROUND	1	21728034	KUD 6,35x4,8x6,35 ALLROUND
9.5	7.9	6.35	52.39	ALLROUND	1	21728021	KUD 9,5x7,9x6,35 ALLROUND
12.7	11.1	6.35	55.56	ALLROUND	1	21728028	KUD 12,7x11,1x6,35 ALLROUND

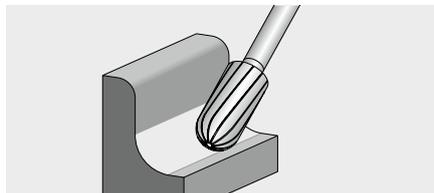
# TC burrs for high-performance applications

ALLROUND cut for versatile use



## Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

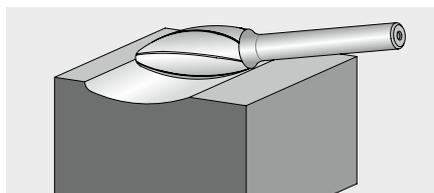
- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	ALLROUND	1	21001010	WRC 0616/6 ALLROUND
10	20	6	60	ALLROUND	1	21001012	WRC 1020/6 ALLROUND
12	25	6	65	ALLROUND	1	21001013	WRC 1225/6 ALLROUND
6.35	15.9	6.35	49.21	ALLROUND	1	21728024	WRC 6,35x15,9x6,35 ALLROUND
9.5	19	6.35	63.5	ALLROUND	1	21728006	WRC 9,5x19x6,35 ALLROUND
12.7	25.4	6.35	69.85	ALLROUND	1	21728001	WRC 12,7x25,4x6,35 ALLROUND



## Flame-shaped B

Flame-shaped burr according to ISO 7755/8 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

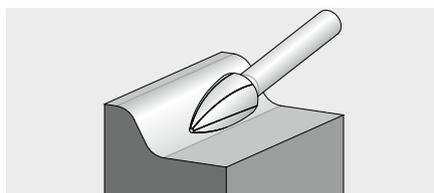
- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
12	30	6	70	2.1	ALLROUND	1	21001017	B 1230/6 ALLROUND
12.7	31.7	6.35	76.2	2.1	ALLROUND	1	21728004	B 12,7x31,7x6,35 ALLROUND



## Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032 with flattened tip for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
10	20	6	60	ALLROUND	1	21001021	SPG 1020/6 ALLROUND
12	25	6	65	ALLROUND	1	21001022	SPG 1225/6 ALLROUND
9.5	19	6.35	63.5	ALLROUND	1	21728015	SPG 9,5x19x6,35 ALLROUND
12.7	25.4	6.35	69.85	ALLROUND	1	21728009	SPG 12,7x25,4x6,35 ALLROUND



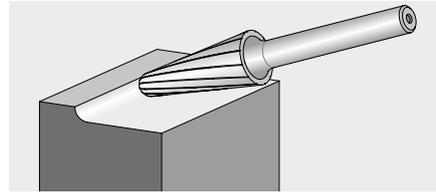
# TC burrs for high-performance applications

## ALLROUND cut for versatile use



### Conical shape with radius end KEL

Conical burr with round radius end according to DIN 8032 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



#### Special features:

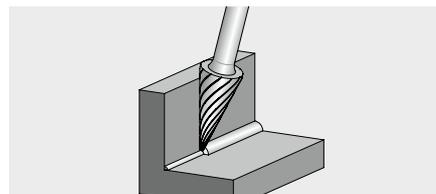
- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	r [mm]	Cut		Item no.	Designation
10	20	6	60	14	2.9	ALLROUND	1	21001026	KEL 1020/6 ALLROUND
12	25	6	65	14	3.3	ALLROUND	1	21001027	KEL 1225/6 ALLROUND
9.5	26.9	6.35	76.2	16	2.9	ALLROUND	1	21728003	KEL 9,9x30,3x6,35 ALLROUND
12.7	28.6	6.35	77.79	14	3.3	ALLROUND	1	21728014	KEL 12,7x28,6x6,35 ALLROUND



### Conical pointed shape SKM

Conical pointed burr according to DIN 8032 with flattened tip for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



#### Special features:

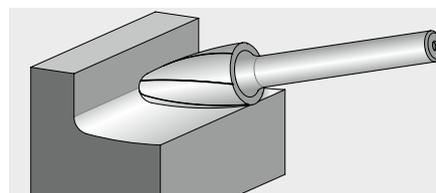
- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Cut		Item no.	Designation
6	18	6	55	18	ALLROUND	1	21001034	SKM 0618/6 ALLROUND
12	25	6	65	26	ALLROUND	1	21001037	SKM 1225/6 ALLROUND
6.35	25.4	6.35	49.21	10	ALLROUND	1	21728036	SKM 6,35x25,4x6,35 ALLROUND
12.7	25.4	6.35	69.85	28	ALLROUND	1	21728016	SKM 12,7x25,4x6,35 ALLROUND



### Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



#### Special features:

- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
6	18	6	55	1.5	ALLROUND	1	21001029	RBF 0618/6 ALLROUND
10	20	6	60	2.5	ALLROUND	1	21001031	RBF 1020/6 ALLROUND
12	25	6	65	2.5	ALLROUND	1	21001032	RBF 1225/6 ALLROUND
6.35	15.9	6.35	49.21	1.5	ALLROUND	1	21728012	RBF 6,35x15,9x6,35 ALLROUND
9.5	19	6.35	63.5	2.5	ALLROUND	1	21728007	RBF 9,5x19x6,35 ALLROUND
12.7	25.4	6.35	69.85	3.2	ALLROUND	1	21728000	RBF 12,7x25,4x6,35 ALLROUND

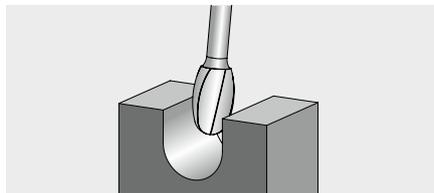
# TC burrs for high-performance applications

ALLROUND cut for versatile use



## Oval shape TRE

Oval burr according to DIN 8032 for versatile, economical and time-saving use on steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron. Also available with wear-resistant HICOAT coating.



### Special features:

- 30% higher stock removal rate when used on steel than conventional cross-cut burrs.
- Comfortable working thanks to reduced vibration and less noise.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
12	20	6	60	5	ALLROUND	1	21001041	TRE 1220/6 ALLROUND
12.7	22.2	6.35	66.68	5	ALLROUND	1	21728025	TRE 12,7x22,2x6,35 ALLROUND



## Set 1406 ALLROUND

Set 1406 ALLROUND contains three versatile tungsten carbide burrs for use on important materials such as steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron in the most common shapes and dimensions.

### Contents:

The set comprises one each of the following: ZYAS 0616/6 ALLROUND, WRC 0616/6 ALLROUND and RBF 0618/6 ALLROUND with a shank diameter of 6 mm, cut ALLROUND.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
ALLROUND	1	21901406	SET 1406 ALLROUND 3TLG



## Set 1414 ALLROUND

Set 1414 ALLROUND contains three versatile tungsten carbide burrs for use on important materials such as steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron in the most common shapes and dimensions.

### Contents:

The set comprises one each of the following: ZYAS 1225/6 ALLROUND, WRC 1225/6 ALLROUND and RBF 1225/6 ALLROUND with a shank diameter of 6 mm, cut ALLROUND.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
ALLROUND	1	21901414	SET 1414 ALLROUND 3TLG

# TC burrs for high-performance applications

ALLROUND cut for versatile use



## Set 1407 ALLROUND

The set contains three versatile tungsten carbide burrs for use on the most important materials such as steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron in the most common shapes and dimensions.

### Contents:

The set comprises one each of the following: ZYAS 6.35x15.9x6.35 ALLROUND, WRC 6.35x15.9x6.35 ALLROUND and RBF 6.35x15.9x6.35 ALLROUND with a shank diameter of 6.35 mm, cut ALLROUND.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

Cut		Item no.	Designation
ALLROUND	1	26001045	SET 1407 ALLROUND 3TLG



## Set 1415 ALLROUND

The set contains three versatile tungsten carbide burrs for use on the most important materials such as steel and cast steel, stainless steel (INOX), non-ferrous metals and cast iron in the most common shapes and dimensions.

### Contents:

The set comprises one each of the following: ZYAS 12.7x25.4x6.35 ALLROUND, WRC 12.7x25.4x6.35 ALLROUND and RBF 12.7x25.4x6.35 ALLROUND with a shank diameter of 6.35 mm, cut ALLROUND.

### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

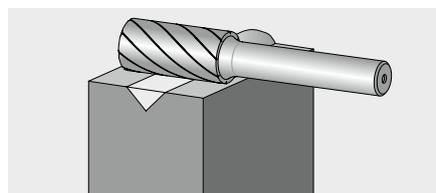
Cut		Item no.	Designation
ALLROUND	1	26001046	SET 1415 ALLROUND 3TLG

## ALU cut for aluminium/non-ferrous metals



### Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032 for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

- Large chips and reduced material adhesion.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
6.35	15.9	6.35	49.21	ALU	1	21724035	ZYA 6,35x15,9x6,35 ALU
12.7	25.4	6.35	69.85	ALU	1	21724105	ZYA 12,7x25,4x6,35 ALU

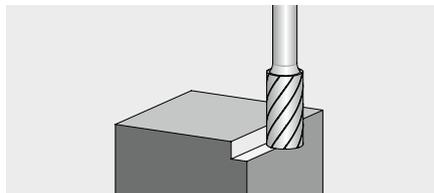
# TC burrs for high-performance applications

ALU cut for aluminium/non-ferrous metals



## Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

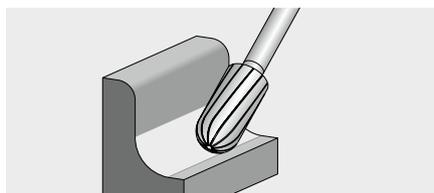
- Large chips and reduced material adhesion.
- HC-NFE coating prevents material adhesion when working on long-chipping and lubricating non-ferrous metals.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
10	20	6	60	ALU	1	21100786	ZYAS 1020/6 ALU
12	25	6	65	ALU	1	21100586	ZYAS 1225/6 ALU



## Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

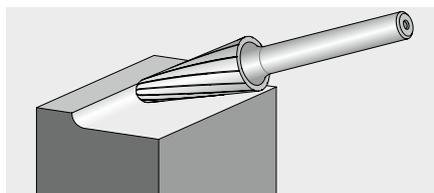
- Large chips and reduced material adhesion.
- HC-NFE coating prevents material adhesion when working on long-chipping and lubricating non-ferrous metals.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
6	16	6	55	ALU	1	21105786	WRC 0616/6 ALU
12	25	6	65	ALU	1	21105386	WRC 1225/6 ALU
6.35	15.9	6.35	49.21	ALU	1	21724395	WRC 6,35x15,9x6,35 ALU
9.5	19	6.35	63.5	ALU	1	21724425	WRC 9,5x19x6,35 ALU
12.7	25.4	6.35	69.85	ALU	1	21724465	WRC 12,7x25,4x6,35 ALU



## Conical shape with radius end KEL

Conical burr with round radius end according to DIN 8032 for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

- Large chips and reduced material adhesion.
- HC-NFE coating prevents material adhesion when working on long-chipping and lubricating non-ferrous metals.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	$r$ [mm]	Cut		Item no.	Designation
12	30	6	70	14	2.6	ALU	1	21125286	KEL 1230/6 ALU
12.7	28.6	6.35	77.79	14	3.3	ALU	1	21725165	KEL 12,7x28,6x6,35 ALU

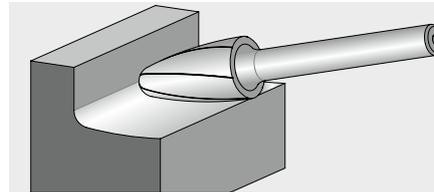
# TC burrs for high-performance applications

ALU cut for aluminium/non-ferrous metals



## Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

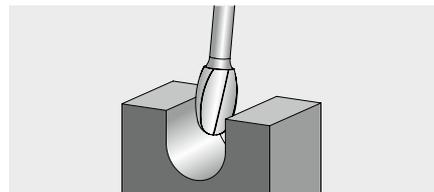
- Large chips and reduced material adhesion.
- HC-NFE coating prevents material adhesion when working on long-chipping and lubricating non-ferrous metals.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
6	18	6	55	1.5	ALU	1	21117386	RBF 0618/6 ALU
10	20	6	60	2.5	ALU	1	21117788	RBF 1020/6 ALU
12	25	6	65	2.5	ALU	1	21117886	RBF 1225/6 ALU
6.35	15.9	6.35	49.21	1.5	ALU	1	21724695	RBF 6,35x15,9x6,35 ALU
9.5	19	6.35	63.5	2.5	ALU	1	21724705	RBF 9,5x19x6,35 ALU
12.7	25.4	6.35	69.85	3.2	ALU	1	21724725	RBF 12,7x25,4x6,35 ALU



## Oval shape TRE

Oval burr according to DIN 8032 for an extremely high stock removal rate, long tool life and smooth operation when machining aluminium.



### Special features:

- Large chips and reduced material adhesion.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
12.7	22.2	6.35	66.68	5	ALU	1	21724655	TRE 12,7x22,2x6,35 ALU



## Set 1611 ALU

The set contains five tungsten carbide burrs for processing aluminium in the most common shapes and dimensions.

### Contents:

The set comprises one each of the following: WRC 6.35x15.9x6.35 ALU, WRC 12.7x25.4x6.35 ALU, TRE 12.7x22.2x6.35 ALU, RBF 12.7x25.4x6.35 ALU and KEL 12.7x28.6x6.35 ALU with a shank diameter of 6.35 mm, cut ALU.

### Special features:

- The sturdy plastic box protects the tools against 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.

Cut		Item no.	Designation
ALU	1	26005695	SET 1611 INCH ALU 5TLG

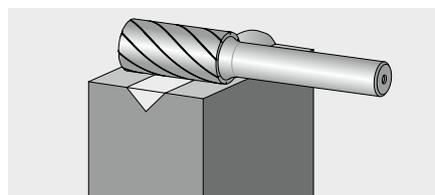
# TC burrs for high-performance applications

## NON-FERROUS cut for non-ferrous metals



### Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032 for general-purpose use on non-ferrous metals and fibre-reinforced plastics.



**Special features:**

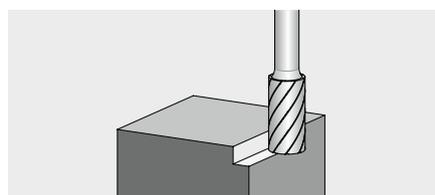
- Very good stock removal rate when used on non-ferrous metals such as brass and copper, plastics and fibre-reinforced plastics.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
12	25	6	65	NON-FERROUS	1	21101996	ZYA 1225/6 NON-FERROUS



### Cylindrical shape ZYAS with end cut

Cylindrical burr according to DIN 8032 with circumferential and end cut for general-purpose use on non-ferrous metals and fibre-reinforced plastics.



**Special features:**

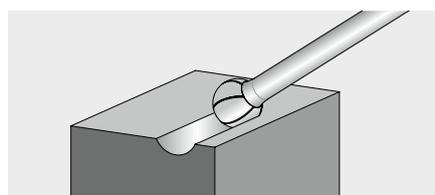
- Very good stock removal rate when used on non-ferrous metals such as brass and copper, plastics and fibre-reinforced plastics.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
12	25	6	65	NON-FERROUS	1	26003054	ZYAS 1225/6 NON-FERROUS



### Ball shape KUD

Ball-shaped burr according to DIN 8032 for general-purpose use on non-ferrous metals and fibre-reinforced plastics.



**Special features:**

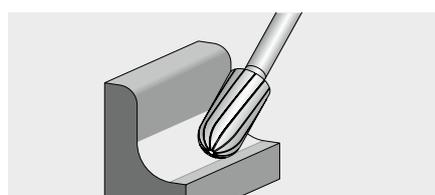
- Very good stock removal rate when used on non-ferrous metals such as brass and copper, plastics and fibre-reinforced plastics.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
8	7	6	47	NON-FERROUS	1	21112696	KUD 0807/6 NON-FERROUS



### Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 for general-purpose use on non-ferrous metals and fibre-reinforced plastics.



**Special features:**

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

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
12	25	6	65	NON-FERROUS	1	21105396	WRC 1225/6 NON-FERROUS

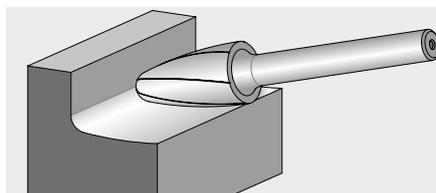
# TC burrs for high-performance applications

## NON-FERROUS cut for non-ferrous metals



### Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for general-purpose use on non-ferrous metals and fibre-reinforced plastics.



#### Special features:

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

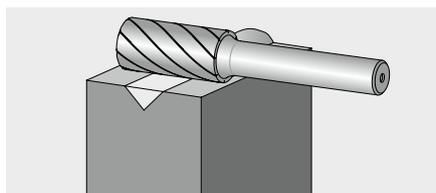
$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
12	25	6	65	2.5	NON-FERROUS	1	26002823	RBF 1225/6 NON-FERROUS

## TOUGH and TOUGH-S cuts for tough applications



### Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

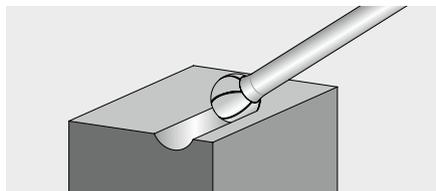
- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
10	20	6	60	TOUGH	1	21000015	ZYA 1020/6 TOUGH
12	25	6	65	TOUGH	1	21000016	ZYA 1225/6 TOUGH
9.5	19	6.35	63.5	TOUGH	1	21722152	ZYA 1020/6,35 TOUGH
12.7	25.4	6.35	69.85	TOUGH	1	21722156	ZYA 1225/6,35 TOUGH



### Ball shape KUD

Ball-shaped burr according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



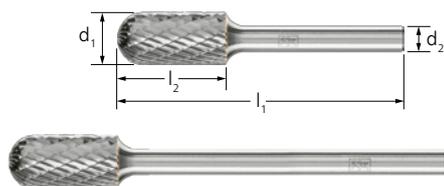
#### Special features:

- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
12	10	6	51	TOUGH	1	21000056	KUD 1210/6 TOUGH
12.7	11.1	6.35	55.56	TOUGH	1	21722244	KUD 1210/6,35 TOUGH

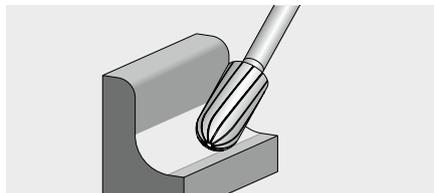
# TC burrs for high-performance applications

## TOUGH and TOUGH-S cuts for tough applications



### Cylindrical shape with radius end WRC

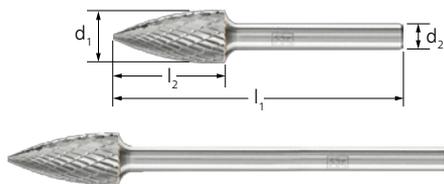
Cylindrical burr with radius end according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

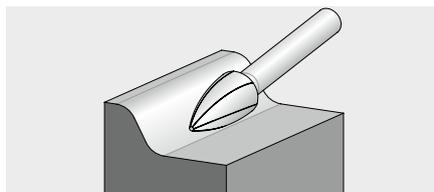
- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
8	20	6	60	TOUGH	1	21000033	WRC 0820/6 TOUGH
10	20	6	60	TOUGH	1	21000035	WRC 1020/6 TOUGH
12	25	6	65	TOUGH	1	21000036	WRC 1225/6 TOUGH
9.5	19	6.35	63.5	TOUGH	1	21722212	WRC 1020/6,35 TOUGH
12.7	25.4	6.35	69.85	TOUGH	1	21722216	WRC 1225/6,35 TOUGH



### Pointed tree shape SPG

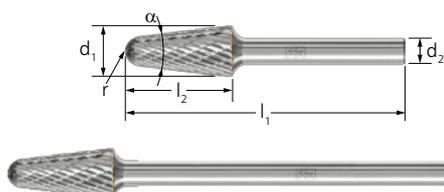
Pointed tree-shaped burr according to DIN 8032 with flattened tip for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

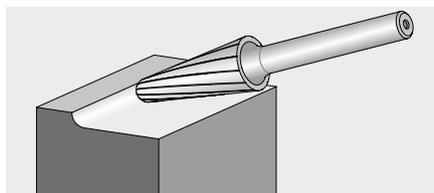
- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
10	20	6	60	TOUGH	1	21000095	SPG 1020/6 TOUGH
12	25	6	65	TOUGH	1	21000097	SPG 1225/6 TOUGH
9.5	19	6.35	63.5	TOUGH	1	21722294	SPG 1020/6,35 TOUGH
12.7	25.4	6.35	69.85	TOUGH	1	21722296	SPG 1225/6,35 TOUGH



### Conical shape with radius end KEL

Conical burr with round radius end according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

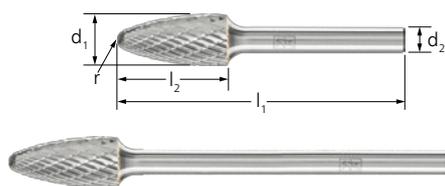
- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	$r$ [mm]	Cut		Item no.	Designation
12	25	6	65	14	3.3	TOUGH	1	21000116	KEL 1225/6 TOUGH
12.7	28.6	6.35	77.79	14	3.3	TOUGH	1	21722346	KEL 1225/6,35 TOUGH



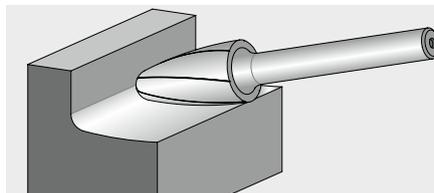
# TC burrs for high-performance applications

## TOUGH and TOUGH-S cuts for tough applications



### Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

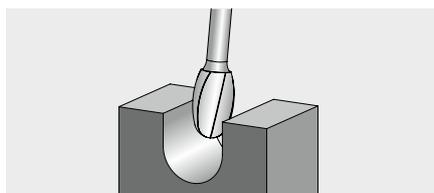
- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
8	20	6	60	1.2	TOUGH	1	21000073	RBF 0820/6 TOUGH
10	20	6	60	2.5	TOUGH	1	21000075	RBF 1020/6 TOUGH
12	25	6	65	2.5	TOUGH	1	21000076	RBF 1225/6 TOUGH
12.7	25.4	6.35	69.85	3.2	TOUGH	1	21722276	RBF 1225/6,35 TOUGH



### Oval shape TRE

Oval burr according to DIN 8032 for tough applications in dockyards, foundries and steel construction. The extremely impact-resistant cut minimizes tooth chipping/breakage, splintering and burr failure. Ideal for use as long-shank variants.



#### Special features:

- Can also be used in low rotational speed ranges.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
10	16	6	56	4	TOUGH	1	21000124	TRE 1016/6 TOUGH
9.5	15.9	6.35	60.33	4	TOUGH	1	21722260	TRE 1016/6,35 TOUGH



### Set 1711 TOUGH

The set contains five tungsten carbide burrs for tough applications in the most common shapes and dimensions.

#### Contents:

The set comprises one each of the following: ZYA 1020/6.35 TOUGH, WRC 1225/6.35 TOUGH, WRC 1020/6.35 TOUGH, SPG 1225/6.35 TOUGH and RBF 1225/6.35 TOUGH with a shank diameter of 6.35 mm, cut TOUGH.

#### Special features:

- The sturdy plastic box protects the tools against 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.

Cut		Item no.	Designation
TOUGH	1	26006171	SET 1711 INCH TOUGH 5TLG

# TC burrs for high-performance applications

## TOUGH and TOUGH-S cuts for tough applications



### Set 1710 TOUGH

The set contains 10 tungsten carbide burrs for tough conditions in the most common shapes and dimensions for general applications.

#### Contents:

It comprises one each of the following: ZYA 1020/6.35 TOUGH, ZYA 1225/6.35 TOUGH, WRC 1020/6.35 TOUGH, WRC 1225/6.35 TOUGH, TRE 1016/6.35 TOUGH, SPG 1020/6.35 TOUGH, SPG 1225/6.35 TOUGH, RBF 1225/6.35 TOUGH,

KUD 1210/6.35 TOUGH and KEL 1225/6.35 TOUGH with a shank diameter of 6.35 mm, cut TOUGH.

#### Special features:

- The sturdy plastic box protects the tools against dirt and damage.

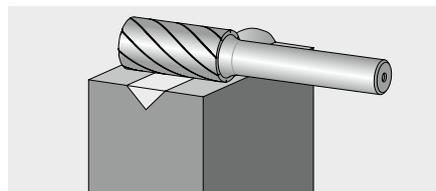
Cut		Item no.	Designation
TOUGH	1	26006172	SET 1710 INCH TOUGH 10TLG

## MICRO cut for finishing work



### Cylindrical shape ZYA without end cut

Cylindrical burr according to DIN 8032 for fine stock removal. Burrs with the MICRO cut offer a higher stock removal rate than mounted/grinding points and impress with their high surface quality. They also operate with low vibration and little noise. Also available with wear-resistant HICOAT coating.



#### Special features:

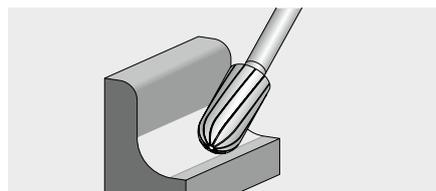
- Unlike with mounted grinding points, there is no change in geometry due to wear and tear.
- Use on almost all materials up to 68 HRC.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	MICRO	1	21101676	ZYA 0616/6 MICRO
8	20	6	60	MICRO	1	21101776	ZYA 0820/6 MICRO
10	20	6	60	MICRO	1	21102176	ZYA 1020/6 MICRO



### Cylindrical shape with radius end WRC

Cylindrical burr with radius end according to DIN 8032 for fine stock removal. Burrs with the MICRO cut offer a higher stock removal rate than mounted/grinding points and impress with their high surface quality. They also operate with low vibration and little noise. Also available with wear-resistant HICOAT coating.



#### Special features:

- Unlike with mounted grinding points, there is no change in geometry due to wear and tear.
- Use on almost all materials up to 68 HRC.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	MICRO	1	21105076	WRC 0616/6 MICRO
8	20	6	60	MICRO	1	21105176	WRC 0820/6 MICRO



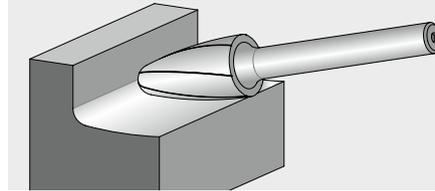
# TC burrs for high-performance applications

## MICRO cut for finishing work



### Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for fine stock removal. Burrs with the MICRO cut offer a higher stock removal rate than mounted/grinding points and impress with their high surface quality. They also operate with low vibration and little noise. Also available with wear-resistant HICOAT coating.



#### Special features:

- Unlike with mounted grinding points, there is no change in geometry due to wear and tear.
- Use on almost all materials up to 68 HRC.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

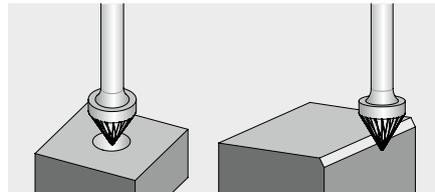
$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
10	20	6	60	2.5	MICRO	1	21157210	RBF 1020/6 MICRO

## TC burrs for flexible and defined work on edges



### Conical counterbore shape KSJ

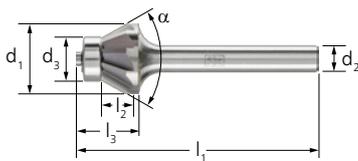
Conical counterbore burr according to DIN 8032 with cut conforming to DIN 8033, with point angle (60°). Suitable for flexible counterboring and chamfering.



#### Special features:

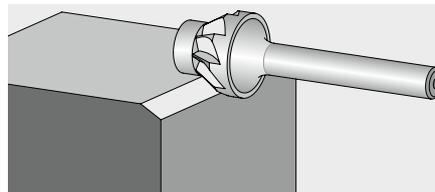
- Can be guided as desired.
- Extremely flexible for use in hard-to-reach areas.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	Cut		Item no.	Designation
16	13	6	56	60	3	1	21115336	KSJ 1613/6 Z3



### Conical counterbore shape KSJ EDGE

Conical counterbore burr for producing precisely defined 30° chamfer angles.



#### Special features:

- Special design for precise guidance, without damaging the workpiece.
- Safe and comfortable to guide thanks to design with ball bearings.
- Creates exact edge shapes in one single step.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$d_3$ [mm]	$l_3$ [mm]	$\alpha$ [°]	Cut		Item no.	Designation
16	5	6	54	10	14	60	EDGE	1	21115366	KSJ 1605/6 EDGE 30°

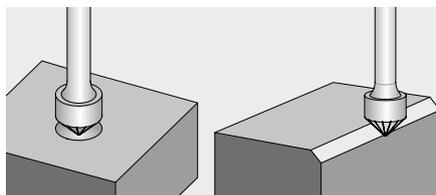
# TC burrs for high-performance applications

## TC burrs for flexible and defined work on edges



### Conical counterbore shape KSK

Conical counterbore burr according to DIN 8032 with cut conforming to DIN 8033, with angle (90°). Suitable for flexible counterboring and chamfering.



**Special features:**

- Can be guided as desired.
- Extremely flexible for use in hard-to-reach areas.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Cut		Item no.	Designation
10	5	6	50	90	3	1	21115836	KSK 1005/6 Z3
16	8	6	53	90	3	1	21115436	KSK 1608/6 Z3



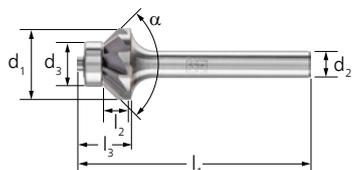
### Conical counterbore shape KSK (double-ended)

Conical counterbore burr (double-ended) according to DIN 8032 with cut conforming to DIN 8033, with angle (90°). Suitable for flexible counterboring and chamfering.

**Special features:**

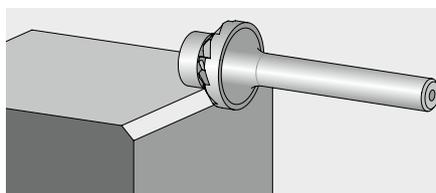
- Can cut and be used on both sides.
- Can be guided as desired.
- Extremely flexible for use in hard-to-reach areas.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Cut		Item no.	Designation
6	3	6	50	90	3	1	21115636	KSK 0603/6 Z3



### Conical counterbore shape KSK EDGE

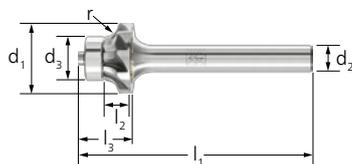
Conical counterbore burr for producing precisely defined 45° chamfer angles.



**Special features:**

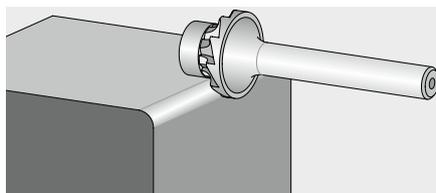
- Special design for precise guidance, without damaging the workpiece.
- Safe and comfortable to guide thanks to design with ball bearings.
- Creates exact edge shapes in one single step.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	d <sub>3</sub> [mm]	l <sub>3</sub> [mm]	α [°]	Cut		Item no.	Designation
16	3	6	52	10	12	90	EDGE	1	21115466	KSK 1603/6 EDGE 45°



### Concave radius burrs V EDGE

Concave radius burrs for the production of precise radii. Suitable for the production and processing of 3 mm outer radii.



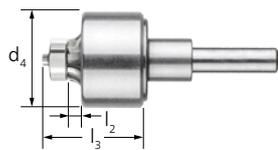
**Special features:**

- Special design for precise guidance, without damaging the workpiece.
- Safe and comfortable to guide thanks to design with ball bearings.
- Creates exact edge shapes in one single step.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	d <sub>3</sub> [mm]	l <sub>3</sub> [mm]	r [mm]	Cut		Item no.	Designation
16	2.5	6	52	10	12	2.5	EDGE	1	26006362	V 1610/6 EDGE R2.5
	3	6	52	10	12	3	EDGE	1	211152936	V 1612/6 EDGE R3,0

# TC burrs for high-performance applications

TC burrs for flexible and defined work on edges



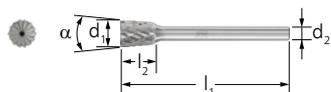
## V EDGE Cutting System

The V EDGE Cutting System (ECS) enables production and processing of 3 mm outer radii. The ECS burr can be reordered and replaced. Matching burr: V 1612/6 EDGE R3.0.

### Special features:

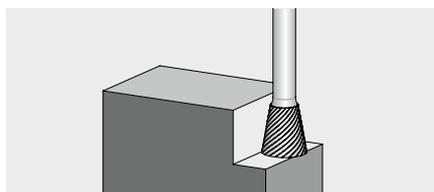
- Special design for precise guidance, without damaging the workpiece.
- Very precise work on edges thanks to additional guide sleeve.
- Creates exact edge shapes in one single step.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	d <sub>3</sub> [mm]	l <sub>3</sub> [mm]	d <sub>4</sub> [mm]	r [mm]	Cut		Item no.	Designation
16	3	6	52	10	24	25	3	EDGE	1	21152946	V 1612/6 EDGE R3,0 ECS



## Inverted cones WKNS with end cut

Inverted cone-shaped rotary cutter, 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.



### Special features:

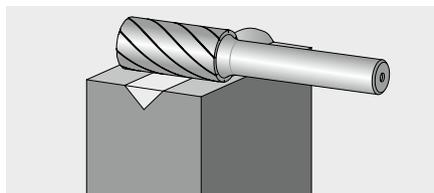
- Can be guided as desired.
- Extremely flexible for use in hard-to-reach areas.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Cut		Item no.	Designation
3	7	3	37	8	5	1	21207553	WKNS 0307/3 Z5



### Cylindrical shape ZYA without end cut

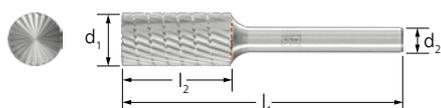
Cylindrical burrs according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

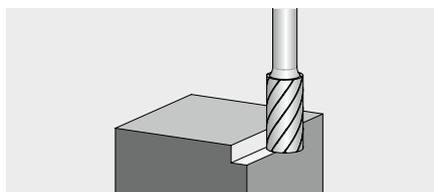
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	MX NCC	1	21301612	ZYA 0616/6 MX NCC
8	20	6	60	MX NCC	1	21301712	ZYA 0820/6 MX NCC
10	20	6	60	MX NCC	1	21301812	ZYA 1020/6 MX NCC
12	25	6	65	MX NCC	1	21301912	ZYA 1225/6 MX NCC
16	25	6	65	MX NCC	1	21302012	ZYA 1625/6 MX NCC
6.35	15.9	6.35	50	MX NCC	1	26007209	ZYA 6,35x15,9x6,35 MX NCC
7.9	19	6.35	64.05	MX NCC	1	26007210	ZYA 7,9x19x6,35 MX NCC
9.5	19	6.35	64.05	MX NCC	1	26007211	ZYA 9,5x19x6,35 MX NCC
12	25	6.35	70.4	MX NCC	1	26006773	ZYA 1225/6,35 MX NCC
16	25	6.35	70.4	MX NCC	1	26007660	ZYA 16x25x6,35 MX NCC



### Cylindrical shape ZYAS with end cut

Cylindrical burrs according to DIN 8032 with circumferential and end cut for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

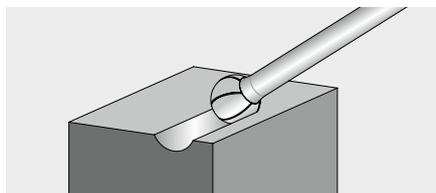
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	MX NCC	1	21300612	ZYAS 0616/6 MX NCC
10	20	6	60	MX NCC	1	21300812	ZYAS 1020/6 MX NCC
12	25	6	65	MX NCC	1	21300912	ZYAS 1225/6 MX NCC
9.5	19	6.35	64.05	MX NCC	1	26007649	ZYAS 9,5x19x6,35 MX NCC
12.7	25.4	6.35	70.4	MX NCC	1	26007650	ZYAS 12,7x25,4x6,35 MX NCC



### Ball shape KUD

Ball-shaped burr according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

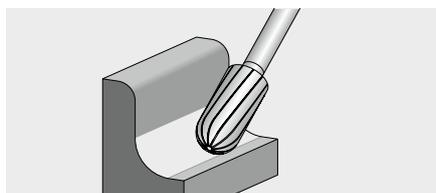
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	5	6	55	MX NCC	1	21312512	KUD 0605/6 MX NCC
10	9	6	49	MX NCC	1	21312712	KUD 1009/6 MX NCC
12	10	6	51	MX NCC	1	21312812	KUD 1210/6 MX NCC
16	14	6	54	MX NCC	1	21312912	KUD 1614/6 MX NCC
6.36	4.8	6.35	50	MX NCC	1	26007651	KUD 6,35x4,8x6,35 MX NCC
9.5	7.9	6.35	53.13	MX NCC	1	26007214	KUD 9,5x7,9x6,35 MX NCC
12	10	6.35	55.8	MX NCC	1	26007652	KUD 1210/6,35 MX NCC
16	14	6.35	59.3	MX NCC	1	26007653	KUD 1614/6,35 MX NCC



### Cylindrical shape with radius end WRC

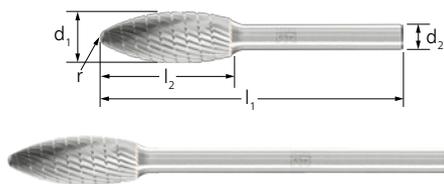
Cylindrical burr with radius end according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

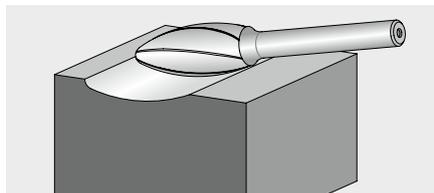
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Cut		Item no.	Designation
6	16	6	55	MX NCC	1	21305012	WRC 0616/6 MX NCC
8	20	6	60	MX NCC	1	21305112	WRC 0820/6 MX NCC
10	20	6	60	MX NCC	1	21305212	WRC 1020/6 MX NCC
12	25	6	65	MX NCC	1	21305312	WRC 1225/6 MX NCC
16	25	6	65	MX NCC	1	21305412	WRC 1625/6 MX NCC
6.35	15.9	6.35	50	MX NCC	1	26007212	WRC 6,35x15,9x6,35 MX NCC
8	20	6.35	64.05	MX NCC	1	26006766	WRC 0820/6,35 MX NCC
10	10	6.35	64.05	MX NCC	1	26006772	WRC 1020/6,35 MX NCC
12	25	6.35	70.4	MX NCC	1	26006770	WRC 1225/6,35 MX NCC
15.9	25.4	6.35	70.4	MX NCC	1	26007213	WRC 15,9x25,4x6,35 MX NCC



### Flame-shaped B

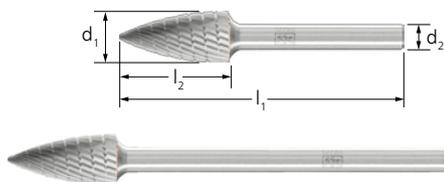
Flame-shaped burr according to ISO 7755/8 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

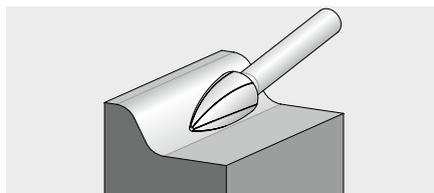
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
12	30	6	70	2.1	MX NCC	1	21303312	B 1230/6 MX NCC
16	35	6	82	2.6	MX NCC	1	21303412	B 1635/6 MX NCC
7.9	19	6.35	64.05	1.25	MX NCC	1	26007220	B 7,9x19x6,35 MX NCC
12	30	6.35	70	2.1	MX NCC	1	26006771	B 1230/6,35 MX NCC
15.9	36.5	6.35	81.5	2.6	MX NCC	1	26007657	B 15,9x36,5x6,35 MX NCC



### Pointed tree shape SPG

Pointed tree-shaped burr according to DIN 8032 with flattened tip for cost-effective stock removal when used on a wide variety of materials.

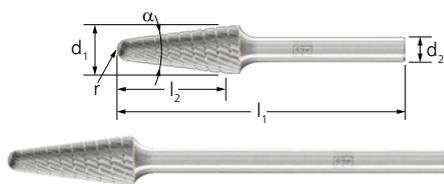


#### Special features:

- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

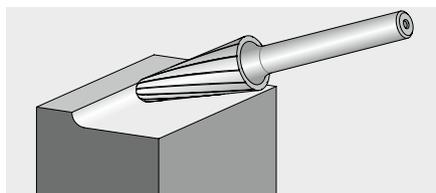
$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	Cut		Item no.	Designation
6	18	6	55	MX NCC	1	21322512	SPG 0618/6 MX NCC
10	20	6	60	MX NCC	1	21322612	SPG 1020/6 MX NCC
12	25	6	65	MX NCC	1	21322712	SPG 1225/6 MX NCC
16	25	6	65	MX NCC	1	21322812	SPG 1625/6 MX NCC
6.35	15.9	6.35	50	MX NCC	1	26007655	SPG 6,35x15,9x6,35 MX NCC
9.5	19	6.35	64.05	MX NCC	1	26007219	SPG 9,5x19x6,35 MX NCC
12	25	6.35	70.4	MX NCC	1	26006768	SPG 1225/6,35 MX NCC
15.9	25.4	6.35	70.4	MX NCC	1	26007656	SPG 15,9x25,4x6,35 MX NCC

2



### Conical shape with radius end KEL

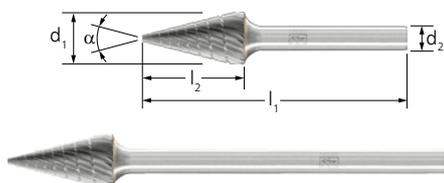
Conical burr with round radius end according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

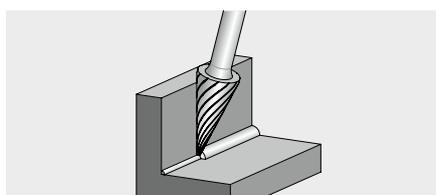
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	r [mm]	Cut		Item no.	Designation
10	20	6	60	14	2.9	MX NCC	1	21325012	KEL 1020/6 MX NCC
12	30	6	70	14	2.6	MX NCC	1	21325212	KEL 1230/6 MX NCC
16	35	6	75	14	4.3	MX NCC	1	21325312	KEL 1635/6 MX NCC
10	20	6.35	64.05	14	2.9	MX NCC	1	26006774	KEL 1020/6,35 MX NCC
12	30	6.35	75	14	2.6	MX NCC	1	26006767	KEL 1230/6,35 MX NCC
16	35	6.35	82	14	4.3	MX NCC	1	26007658	KEL 16x35x6,35 MX NCC



### Conical pointed shape SKM

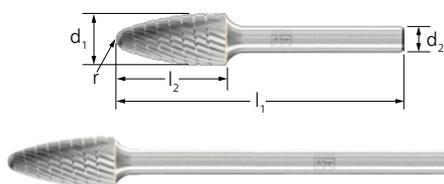
Conical pointed burr according to DIN 8032 with flattened tip for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

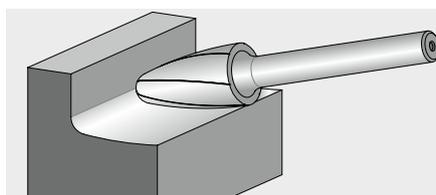
- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	r [mm]	Cut		Item no.	Designation
6	18	6	55	18		MX NCC	1	21315012	SKM 0618/6 MX NCC
10	20	6	60	28		MX NCC	1	21315112	SKM 1020/6 MX NCC
12	25	6	65	26		MX NCC	1	21315212	SKM 1225/6 MX NCC
6.35	19	6.35	50	14		MX NCC	1	26007221	SKM 6,35x19x6,35 MX NCC
9.5	19	6.35	64.05	14		MX NCC	1	26007659	SKM 9,5x19x6,35 MX NCC
12.7	23	6.35	70.7	14		MX NCC	1	26007222	SKM 12,7x25,4x6,35 MX NCC



### Tree shape with radius end RBF

Tree-shaped burr with radius end according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	r [mm]	Cut		Item no.	Designation
6	18	6	55	1.5	MX NCC	1	21317312	RBF 0618/6 MX NCC
10	20	6	60	2.5	MX NCC	1	21317712	RBF 1020/6 MX NCC
12	25	6	65	2.5	MX NCC	1	21317812	RBF 1225/6 MX NCC
16	25	6	65	4.9	MX NCC	1	21317912	RBF 1625/6 MX NCC

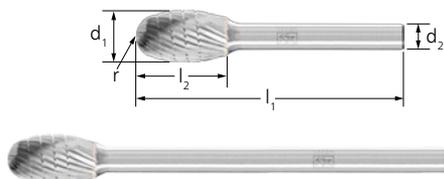
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# NEW PFERD TOOLS COMBICUT TC burrs

## MX NCC

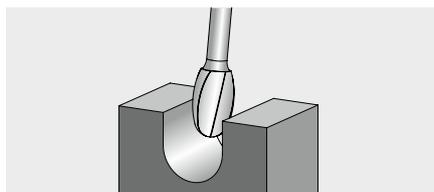


$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
6.35	15.9	6.35	50	1.5	MX NCC	1	26007217	RBF 6,35x15,9x6,35 MX NCC
9.5	19	6.35	64.05	2.5	MX NCC	1	26007218	RBF 9,5x19x6,35 MX NCC
12	25	6.35	70.4	2.5	MX NCC	1	26006769	RBF 1225/6,35 MX NCC
16	25	6.35	70.4	4.9	MX NCC	1	26007200	RBF 1625/6,35 MX NCC



### Oval shape TRE

Oval burr according to DIN 8032 for cost-effective stock removal when used on a wide variety of materials.



#### Special features:

- Good stock removal rate and tool life.
- There is reduced wear on the tool drive due to impact-free work without chatter marks, thanks to the high concentricity.

$d_1$ [mm]	$l_2$ [mm]	$d_2$ [mm]	$l_1$ [mm]	$r$ [mm]	Cut		Item no.	Designation
10	16	6	56	4	MX NCC	1	21335112	TRE 1016/6 MX NCC
12	20	6	60	5	MX NCC	1	21335212	TRE 1220/6 MX NCC
16	25	6	65	6.5	MX NCC	1	21335313	TRE 1625/6 MX NCC
9.5	15.9	6.35	60.9	3.8	MX NCC	1	26007215	TRE 9,5x15,9x6,35 MX NCC
12.7	22.22	6.35	67.22	5	MX NCC	1	26007216	TRE 12,7x22,2x6,35 MX NCC
15.9	25.4	6.35	70.4	6.18	MX NCC	1	26007654	TRE 15,9x25,4x6,35 MX NCC

### Set 1/4" MX NCC 4-PIECE

The set contains the four most common shapes in the general cut MX NCC.

#### Contents:

The set comprises one each of the following: ZYA 6.35x15.9x6.35 MX NCC, WRC 6.35x15.9x6.35 MX NCC, SPG 9.5x19x6.35 MX NCC and RBF 1225/6.35 MX NCC with a shank diameter of 6.35 mm, cut MX NCC.

#### Special features:

- The robust round plastic box with screw-on top protects the tools against dirt and damage.



Cut		Item no.	Designation
MX NCC	1	75609063	Set 6.35/4-6.35-9.5-12 MX NCC 4TLG

# NEW PFERD TOOLS COMBICUT TC burrs

## MX NCC



### Set 1/4" MX NCC 8-PIECE

The set contains the eight most common shapes in the general cut MX NCC.

#### Contents:

The set comprises one each of the following: ZYA 6.35x15.9x6.35 MX NCC, WRC 6.35x15.9x6.35 MX NCC, WRC 1020/6.35 MX NCC, WRC 1225/6.35 MX NCC, RBF 1225/6.35 MX NCC, KEL 1020/6.35 MX NCC, SKM 6.35x19x6.35 MX NCC and KUD 9.5x7.9x6.35 MX NCC with a shank diameter of 6.35 mm, cut MX NCC.

#### Special features:

- The robust round plastic box with screw-on top protects the tools against dirt and damage.

Cut		Item no.	Designation
MX NCC	1	75609064	Set 6.35/8-6,35-9,5-10-12 MX NCC 8TLG

# Milling tools with cutting inserts

The quick way to find the perfect tool



## ALUMASTER High Speed Disc HSD-F 115/125

Type HSD-F 115/125 was developed specifically for use on angle grinders with a diameter of 115/125 mm and for flat working.

### Suitable tool drives:

Compressed-air angle grinder  
PWT 26/120 HV M14  
Electric angle grinder UWER 18/110 SI

### Applications:

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



## ALUMASTER High Speed Disc HSD-R 115/125

Type HSD-R 115/125 has taken the HSD-F one step further and is also suitable for applications such as peripheral milling and milling out root seams.

### Suitable tool drives:

Compressed-air angle grinder  
PWT 26/120 HV M14  
Electric angle grinder UWER 18/110 SI

### Applications:

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



## High Speed Disc ALUMASTER HSD-R 50

Due to its small design, type HSD-R 50 is very well-suited to work in hard-to-reach places and on delicate components. Thanks to its specially developed arbor, the High Speed Disc ALUMASTER HSD-R 50 can also be used on straight grinders and flexible shafts as well as angle grinders (mount dia. 10 mm).

### Matching tool drives:

Flexible shaft drive Mammoth Electronic  
ME 22/240  
Compressed-air straight grinder  
PGAS 4/250 E-HV  
Compressed-air angle grinder  
PWSA 4/200 HV

### Applications:

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



## High Speed Torus Cutter HSC-T 20 RS8

Thanks to its specially developed design, the High Speed Torus Cutter HSC-T 20 is suitable for work on grooves, pockets and narrow radii and contours, particularly in robot applications. The Cutter can also be used face down and perfectly complements the ALUMASTER High Speed Disc in the HSD-R 50 version and burrs with the ALU cut.

### Matching tool drives:

Air-powered spindle PGAS 4/280 RS  
Air-powered spindle PGAS 4/220 RS

### Applications:

- Milling out
- Deburring
- Work on weld seams
- Work on fillet welds
- Work on edges/chamfering
- Surface work
- Circumferential milling
- Face milling
- Cleaning cast aluminium



# Milling tools with cutting inserts

The quick way to find the perfect tool



2



**High Speed Disc ALUMASTER HSD-R 50 RS** – suitable only for robot applications

**Suitable tool drives:**  
Air-powered spindle PGAS 4/220 RS  
Air-powered spindle PGAS 4/280 RS

- Applications:**
- Milling out
  - Work on weld seams
  - Work on fillet welds
  - Work on edges/chamfering
  - Surface work
  - Milling out root seams
  - Circumferential milling



**High Speed Disc ALUMASTER HSD-R 125 RS** – suitable only for robot applications

**Suitable tool drives:**  
Air-powered spindle PWA 11/120 RS

- Applications:**
- Milling out
  - Work on weld seams
  - Work on fillet welds
  - Work on edges/chamfering
  - Surface work
  - Milling out root seams
  - Circumferential milling



**High Speed Disc ALUMASTER HSD-R 150 RS** – suitable only for robot applications

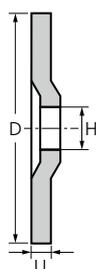
**Suitable tool drives:**  
High-frequency spindles

- Applications:**
- Milling out
  - Work on weld seams
  - Work on fillet welds
  - Work on edges/chamfering
  - Surface work
  - Milling out root seams
  - Circumferential milling

## Selecting suitable cutting inserts

- Uncoated cutting inserts are suitable for general use on soft non-ferrous metals (aluminium alloys, brass, copper, zinc).
- PFERD TOOLS recommends cutting inserts with the high-quality HICOAT coating for high-performance applications on soft non-ferrous metals (aluminium alloys, brass, copper, zinc), hard non-ferrous metals (hard aluminium alloys with high Si content, bronze) as well as fibre-reinforced plastics (GRP/CRP) and thermoplastics.

## ALUMASTER High Speed Disc



### High Speed Disc ALUMASTER HSD-R 115/125

High-performance tool for peripheral milling and milling out root seams using an angle grinder. The specially developed, turnable and replaceable tungsten carbide cutting inserts enable an extremely high stock removal rate on aluminium alloys.

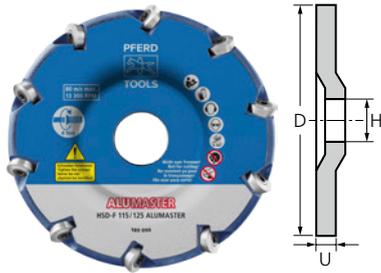
**Contents:**  
The delivery includes the High Speed Disc ALUMASTER HSD-R 115/125 incl. pre-mounted tungsten carbide cutting inserts, a hexalobular socket wrench and a plastic box.

- Special features:**
- An extraction system is not required as no hazardous or explosive dust is generated.
  - Innovative, robust cut geometry for maximum safety, extreme durability and ease of work.

D [mm]	H [mm]	U [mm]	Max. RPM		Item no.	Designation
115	22.23	8	13,300	1	22000019	HSD-R 115/125 ALUMASTER

# Milling tools with cutting inserts

## ALUMASTER High Speed Disc



### High Speed Disc ALUMASTER HSD-F 115/125

High-performance tool for surface work with an angle grinder. The specially developed, turnable and replaceable tungsten carbide cutting inserts enable an extremely high stock removal rate on aluminium alloys.

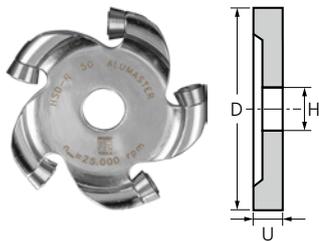
#### Contents:

The delivery includes the High Speed Disc ALUMASTER HSD-F 115/125 incl. pre-mounted tungsten carbide cutting inserts, a hexalobular socket wrench and a plastic box.

#### Special features:

- An extraction system is not required as no hazardous or explosive dust is generated.
- Innovative, robust cut geometry for maximum safety, extreme durability and ease of work.

D [mm]	H [mm]	U [mm]	Max. RPM		Item no.	Designation
115	22.23	13	13,300	1	22000009	HSD-F 115/125 ALUMASTER



### High Speed Disc ALUMASTER HSD-R 50

High-performance tool for hard-to-reach areas and delicate components. The specially developed, turnable and replaceable tungsten carbide cutting inserts enable an extremely high stock removal rate on aluminium alloys. A guard is not needed (tool diameter = 49 mm).

#### Contents:

The delivery includes the High Speed Disc ALUMASTER HSD-R 50 incl. pre-mounted tungsten carbide cutting inserts, a hexalobular socket wrench and a plastic box.

#### Special features:

- Can be used on angle grinders (mount dia. 10 mm), straight grinders and flexible shafts in conjunction with specially developed arbor.
- An extraction system is not required as no hazardous or explosive dust is generated.

D [mm]	H [mm]	U [mm]	Max. RPM		Item no.	Designation
49	10	8	25,000	1	22000025	HSD-R 50 ALUMASTER



### Arbor for High Speed Disc ALUMASTER HSD-R 50

For use on flexible shaft drives, straight grinders and robot spindles.

d <sub>1</sub> [mm]	l <sub>1</sub> [mm]	l <sub>2</sub> [mm]	Suitable for		Item no.	Designation
8	33	50	ALUMASTER HSD-R 50	1	22000011	BO 8/10 HSD-R 50



### Cutting insert sets

Cutting insert set for ALUMASTER High Speed Disc.

D [mm]	Contents [Piece]	Suitable for	Version		Item no.	Designation
8	5	ALUMASTER HSD-R 50	Without coating	1	22000026	WSP-A-8R 50 ALUMASTER
			With HICOAT coating	1	22000028	WSP-A-8R 50 ALUMASTER HICOAT
	10	ALUMASTER HSD-R 115/125	Without coating	1	22000020	WSP-A-8R 115/125 ALUMASTER
			With HICOAT coating	1	22000022	WSP-A-8R 115/125 ALUMASTER HICOAT
12	10	ALUMASTER HSD-F	Without coating	1	22000008	WSP-A-12R 115/125 ALUMASTER
			With HICOAT coating	1	22000013	WSP-A-12R 115/125 ALUMASTER HICOAT

# Milling tools with cutting inserts

## ALUMASTER High Speed Disc



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### Bolt sets for cutting inserts

Bolt set for PFERD TOOLS cutting inserts.

Contents [Piece]		Item no.	Designation
5	1	22000007	WSP-S-M4S



HICOAT

### ALUMASTER service sets

For replacing individual cutting inserts on the **ALUMASTER** High Speed Disc.

#### Contents:

The delivery includes two cutting inserts, two screws and a hexalobular socket wrench.

Suitable for	Version		Item no.	Designation
ALUMASTER HSD-R 50	Without coating	1	22000029	ASS-R8 50 ALUMASTER
ALUMASTER HSD-R 115/125	Without coating	1	22000023	ASS-R8 115/125 ALUMASTER
ALUMASTER HSD-F	Without coating	1	22000014	ASS-R12 115/125 ALUMASTER



### Torque spanner and spare blade

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



	Item no.	Designation
<b>Torque spanner for ALUMASTER</b>		
1	22000017	DSWK WIHA Torque 4,0

## EDGE FINISH system for work on edges



### Bolt set for cutting inserts

Bolt set for PFERD TOOLS cutting inserts.

Contents [Piece]		Item no.	Designation
5	1	22000007	WSP-S-M4S

### Recommended rotational speed range [RPM]

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

- ① Select the material group to be machined.
- ② Select the type.
- ③ Establish the cutting speed range.

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

- ④ Select the required diameter.
- ⑤ The cutting speed range and the diameter determine the recommended rotational speed range.



2



① Material group			② Design	③ Cutting speed
Steel, cast steel	Steels up to 700 N/mm <sup>2</sup> (< 220 HB)	Construction steels, carbon steels, tool steels, alloyed and non-alloyed steels, case-hardened steels, cast steel, tempering steels	STEEL	25–35 m/min
	Steels over 700 N/mm <sup>2</sup> (> 220 HB)		STEEL INOX	20–25 m/min
Stainless steel (INOX)	Rust and acid-resistant steels	Austenitic and ferritic stainless steels	INOX	10–20 m/min
Non-ferrous metals	Soft non-ferrous metals	Aluminium alloys Brass, copper, zinc	STEEL INOX	30–60 m/min
	Hard non-ferrous metals	Bronze, titanium/titanium alloys, hard aluminium alloys (high Si content)	STEEL INOX	25–50 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 annealed cast iron EN-GJMB (GTS)	STEEL	10–25 m/min
			INOX	
Plastics, other materials	Fibre-reinforced thermoplastics and duroplastics, hard rubber, wood		STEEL	15–40 m/min
			INOX	

# Drilling tools

## HSS spiral drill



### Example:

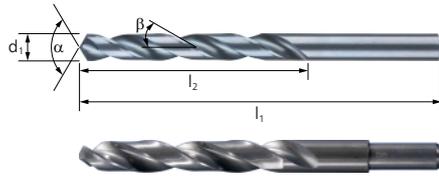
Spiral drill,  
SPB DIN 338 HSSG N 12.0 STEEL,  
Tool dia. 12 mm.

Steels up to 700 N/mm<sup>2</sup>.

Cutting speed: 25–35 m/min

**Rotational speed range: 650–950 RPM**

④ Tool dia. [mm]	⑤ Cutting speeds [m/min]								
	10	15	20	25	30	35	40	50	60
	Rotational speeds [RPM]								
1	3,185	4,777	6,369	7,962	9,554	11,146	12,739	15,924	19,108
1.1	2,895	4,343	5,790	7,238	8,686	10,133	11,581	14,476	17,371
1.2	2,654	3,981	5,308	6,635	7,962	9,289	10,616	13,270	15,924
1.3	2,450	3,675	4,900	6,124	7,349	8,574	9,799	12,249	14,699
1.4	2,275	3,412	4,550	5,687	6,824	7,962	9,099	11,374	13,649
1.5	2,123	3,185	4,246	5,308	6,369	7,431	8,493	10,616	12,739
1.6	1,990	2,986	3,981	4,976	5,971	6,967	7,962	9,952	11,943
1.7	1,873	2,810	3,747	4,683	5,620	6,557	7,493	9,367	11,240
1.8	1,769	2,654	3,539	4,423	5,308	6,192	7,077	8,846	10,616
1.9	1,676	2,514	3,352	4,190	5,028	5,867	6,705	8,381	10,057
2	1,592	2,389	3,185	3,981	4,777	5,573	6,369	7,962	9,554
2.1	1,517	2,275	3,033	3,791	4,550	5,308	6,066	7,583	9,099
2.2	1,448	2,171	2,895	3,619	4,343	5,067	5,790	7,238	8,686
2.3	1,385	2,077	2,769	3,462	4,154	4,846	5,539	6,923	8,308
2.4	1,327	1,990	2,654	3,317	3,981	4,644	5,308	6,635	7,962
2.5	1,274	1,911	2,548	3,185	3,822	4,459	5,096	6,369	7,643
2.6	1,225	1,837	2,450	3,062	3,675	4,287	4,900	6,124	7,349
2.7	1,180	1,769	2,359	2,949	3,539	4,128	4,718	5,898	7,077
2.8	1,137	1,706	2,275	2,843	3,412	3,981	4,550	5,687	6,824
2.9	1,098	1,647	2,196	2,745	3,295	3,844	4,393	5,491	6,589
3	1,062	1,592	2,123	2,654	3,185	3,715	4,246	5,308	6,369
3.1	1,027	1,541	2,055	2,568	3,082	3,596	4,109	5,137	6,164
3.2	995	1,493	1,990	2,488	2,986	3,483	3,981	4,976	5,971
3.3	965	1,448	1,930	2,413	2,895	3,378	3,860	4,825	5,790
3.4	937	1,405	1,873	2,342	2,810	3,278	3,747	4,683	5,620
3.5	910	1,365	1,820	2,275	2,730	3,185	3,640	4,550	5,460
3.6	885	1,327	1,769	2,212	2,654	3,096	3,539	4,423	5,308
3.7	861	1,291	1,721	2,152	2,582	3,013	3,443	4,304	5,164
3.8	838	1,257	1,676	2,095	2,514	2,933	3,352	4,190	5,028
3.9	817	1,225	1,633	2,041	2,450	2,858	3,266	4,083	4,900
4	796	1,194	1,592	1,990	2,389	2,787	3,185	3,981	4,777
4.5	708	1,062	1,415	1,769	2,123	2,477	2,831	3,539	4,246
5	637	955	1,274	1,592	1,911	2,229	2,548	3,185	3,822
5.5	579	869	1,158	1,448	1,737	2,027	2,316	2,895	3,474
6	531	796	1,062	1,327	1,592	1,858	2,123	2,654	3,185
6.5	490	735	980	1,225	1,470	1,715	1,960	2,450	2,940
7	455	682	910	1,137	1,365	1,592	1,820	2,275	2,730
7.5	425	637	849	1,062	1,274	1,486	1,699	2,123	2,548
8	398	597	796	995	1,194	1,393	1,592	1,990	2,389
8.5	375	562	749	937	1,124	1,311	1,499	1,873	2,248
9	354	531	708	885	1,062	1,238	1,415	1,769	2,123
9.5	335	503	670	838	1,006	1,173	1,341	1,676	2,011
10	318	478	637	796	955	1,115	1,274	1,592	1,911
10.5	303	455	607	758	910	1,062	1,213	1,517	1,820
11	290	434	579	724	869	1,013	1,158	1,448	1,737
11.5	277	415	554	692	831	969	1,108	1,385	1,662
12	265	398	531	663	796	929	1,062	1,327	1,592
12.5	255	382	510	637	764	892	1,019	1,274	1,529
13	245	367	490	612	735	857	980	1,225	1,470
13.5	236	354	472	590	708	826	944	1,180	1,415
14	227	341	455	569	682	796	910	1,137	1,365
14.5	220	329	439	549	659	769	879	1,098	1,318
15	212	318	425	531	637	743	849	1,062	1,274
15.5	205	308	411	514	616	719	822	1,027	1,233
16	199	299	398	498	597	697	796	995	1,194



### DIN 338 HSSG N STEEL spiral drill

High-performance drilling tools in the STEEL in HSSG (M2) version for universal industrial use on steel, aluminium, brass, bronze, cast material and plastics. Fully ground, right-hand turning version with cross grinding. With dia. 13 x 35 mm stepped shank as from a drill dia. of 13.5 mm.

**Special features:**

- Long tool life and easy centring.

- Good chip removal and high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Spiral angle β [°]	Version		Item no.	Designation
1	12	34	118	25 – 30	STEEL	10	25203510	SPB DIN 338 HSSG N 1,0 STEEL
1.1	14	36	118	25 – 30	STEEL	10	25203586	SPB DIN 338 HSSG N 1,1 STEEL
1.2	16	38	118	25 – 30	STEEL	10	25203587	SPB DIN 338 HSSG N 1,2 STEEL
1.3	16	38	118	25 – 30	STEEL	10	25203588	SPB DIN 338 HSSG N 1,3 STEEL
1.4	18	40	118	25 – 30	STEEL	10	25203589	SPB DIN 338 HSSG N 1,4 STEEL
1.5	18	40	118	25 – 30	STEEL	10	25203511	SPB DIN 338 HSSG N 1,5 STEEL
1.6	20	43	118	25 – 30	STEEL	10	25203512	SPB DIN 338 HSSG N 1,6 STEEL
1.7	20	43	118	25 – 30	STEEL	10	25203590	SPB DIN 338 HSSG N 1,7 STEEL
1.8	22	46	118	25 – 30	STEEL	10	25203591	SPB DIN 338 HSSG N 1,8 STEEL
1.9	22	46	118	25 – 30	STEEL	10	25203592	SPB DIN 338 HSSG N 1,9 STEEL
2	24	49	118	25 – 30	STEEL	10	25203513	SPB DIN 338 HSSG N 2,0 STEEL
2.1	24	49	118	25 – 30	STEEL	10	25203593	SPB DIN 338 HSSG N 2,1 STEEL
2.2	27	53	118	25 – 30	STEEL	10	25203594	SPB DIN 338 HSSG N 2,2 STEEL
2.3	27	53	118	25 – 30	STEEL	10	25203595	SPB DIN 338 HSSG N 2,3 STEEL
2.4	30	57	118	25 – 30	STEEL	10	25203596	SPB DIN 338 HSSG N 2,4 STEEL
2.5	30	57	118	25 – 30	STEEL	10	25203514	SPB DIN 338 HSSG N 2,5 STEEL
2.6	30	57	118	25 – 30	STEEL	10	25203597	SPB DIN 338 HSSG N 2,6 STEEL
2.7	33	61	118	25 – 30	STEEL	10	25203598	SPB DIN 338 HSSG N 2,7 STEEL
2.8	33	61	118	25 – 30	STEEL	10	25203599	SPB DIN 338 HSSG N 2,8 STEEL
2.9	33	61	118	25 – 30	STEEL	10	25203650	SPB DIN 338 HSSG N 2,9 STEEL
3	33	61	118	25 – 30	STEEL	10	25203515	SPB DIN 338 HSSG N 3,0 STEEL
3.1	36	65	118	25 – 30	STEEL	10	25203516	SPB DIN 338 HSSG N 3,1 STEEL
3.2	36	65	118	25 – 30	STEEL	10	25203651	SPB DIN 338 HSSG N 3,2 STEEL
3.3	36	65	118	25 – 30	STEEL	10	25203517	SPB DIN 338 HSSG N 3,3 STEEL
3.4	39	70	118	25 – 30	STEEL	10	25203518	SPB DIN 338 HSSG N 3,4 STEEL
3.5	39	70	118	25 – 30	STEEL	10	25203519	SPB DIN 338 HSSG N 3,5 STEEL
3.6	39	70	118	25 – 30	STEEL	10	25203520	SPB DIN 338 HSSG N 3,6 STEEL
3.7	39	70	118	25 – 30	STEEL	10	25203652	SPB DIN 338 HSSG N 3,7 STEEL
3.8	43	75	118	25 – 30	STEEL	10	25203653	SPB DIN 338 HSSG N 3,8 STEEL
3.9	43	75	118	25 – 30	STEEL	10	25203654	SPB DIN 338 HSSG N 3,9 STEEL
4	43	75	118	25 – 30	STEEL	10	25203521	SPB DIN 338 HSSG N 4,0 STEEL
4.1	43	75	118	25 – 30	STEEL	10	25203522	SPB DIN 338 HSSG N 4,1 STEEL
4.2	43	75	118	25 – 30	STEEL	10	25203523	SPB DIN 338 HSSG N 4,2 STEEL
4.3	47	80	118	25 – 30	STEEL	10	25203655	SPB DIN 338 HSSG N 4,3 STEEL
4.4	47	80	118	25 – 30	STEEL	10	25203524	SPB DIN 338 HSSG N 4,4 STEEL
4.5	47	80	118	25 – 30	STEEL	10	25203525	SPB DIN 338 HSSG N 4,5 STEEL
4.6	47	80	118	25 – 30	STEEL	10	25203656	SPB DIN 338 HSSG N 4,6 STEEL
4.7	47	80	118	25 – 30	STEEL	10	25203657	SPB DIN 338 HSSG N 4,7 STEEL
4.8	53	86	118	25 – 30	STEEL	10	25203658	SPB DIN 338 HSSG N 4,8 STEEL
4.9	53	86	118	25 – 30	STEEL	10	25203659	SPB DIN 338 HSSG N 4,9 STEEL
5	52	86	118	25 – 30	STEEL	10	25203526	SPB DIN 338 HSSG N 5,0 STEEL
5.1	52	86	118	25 – 30	STEEL	10	25203527	SPB DIN 338 HSSG N 5,1 STEEL
5.2	52	86	118	25 – 30	STEEL	10	25203528	SPB DIN 338 HSSG N 5,2 STEEL
5.3	52	86	118	25 – 30	STEEL	10	25203529	SPB DIN 338 HSSG N 5,3 STEEL
5.4	57	93	118	25 – 30	STEEL	10	25203660	SPB DIN 338 HSSG N 5,4 STEEL
5.5	57	93	118	25 – 30	STEEL	10	25203530	SPB DIN 338 HSSG N 5,5 STEEL
5.6	57	93	118	25 – 30	STEEL	10	25203661	SPB DIN 338 HSSG N 5,6 STEEL

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$d_1$ [mm]	$l_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	Spiral angle $\beta$ [°]	Version		Item no.	Designation
5.7	57	93	118	25 – 30	STEEL	10	25203662	SPB DIN 338 HSSG N 5,7 STEEL
5.8	57	93	118	25 – 30	STEEL	10	25203663	SPB DIN 338 HSSG N 5,8 STEEL
5.9	57	93	118	25 – 30	STEEL	10	25203664	SPB DIN 338 HSSG N 5,9 STEEL
6	57	93	118	25 – 30	STEEL	10	25203531	SPB DIN 338 HSSG N 6,0 STEEL
6.1	63	101	118	25 – 30	STEEL	10	25203665	SPB DIN 338 HSSG N 6,1 STEEL
6.2	63	101	118	25 – 30	STEEL	10	25203666	SPB DIN 338 HSSG N 6,2 STEEL
6.3	63	101	118	25 – 30	STEEL	10	25203667	SPB DIN 338 HSSG N 6,3 STEEL
6.4	63	101	118	25 – 30	STEEL	10	25203668	SPB DIN 338 HSSG N 6,4 STEEL
6.5	63	101	118	25 – 30	STEEL	10	25203532	SPB DIN 338 HSSG N 6,5 STEEL
6.6	63	101	118	25 – 30	STEEL	10	25203669	SPB DIN 338 HSSG N 6,6 STEEL
6.7	63	101	118	25 – 30	STEEL	10	25203670	SPB DIN 338 HSSG N 6,7 STEEL
6.8	69	109	118	25 – 30	STEEL	10	25203533	SPB DIN 338 HSSG N 6,8 STEEL
6.9	69	109	118	25 – 30	STEEL	10	25203671	SPB DIN 338 HSSG N 6,9 STEEL
7	69	109	118	25 – 30	STEEL	10	25203534	SPB DIN 338 HSSG N 7,0 STEEL
7.1	69	109	118	25 – 30	STEEL	10	25203672	SPB DIN 338 HSSG N 7,1 STEEL
7.2	69	109	118	25 – 30	STEEL	10	25203673	SPB DIN 338 HSSG N 7,2 STEEL
7.3	69	109	118	25 – 30	STEEL	10	25203674	SPB DIN 338 HSSG N 7,3 STEEL
7.4	69	117	118	25 – 30	STEEL	10	25203675	SPB DIN 338 HSSG N 7,4 STEEL
7.5	69	109	118	25 – 30	STEEL	10	25203535	SPB DIN 338 HSSG N 7,5 STEEL
7.6	75	117	118	25 – 30	STEEL	10	25203676	SPB DIN 338 HSSG N 7,6 STEEL
7.7	75	117	118	25 – 30	STEEL	10	25203677	SPB DIN 338 HSSG N 7,7 STEEL
7.8	75	117	118	25 – 30	STEEL	10	25203678	SPB DIN 338 HSSG N 7,8 STEEL
7.9	75	117	118	25 – 30	STEEL	10	25203679	SPB DIN 338 HSSG N 7,9 STEEL
8	75	117	118	25 – 30	STEEL	10	25203536	SPB DIN 338 HSSG N 8,0 STEEL
8.1	75	117	118	25 – 30	STEEL	10	25203680	SPB DIN 338 HSSG N 8,1 STEEL
8.2	75	117	118	25 – 30	STEEL	10	25203681	SPB DIN 338 HSSG N 8,2 STEEL
8.3	75	117	118	25 – 30	STEEL	10	25203682	SPB DIN 338 HSSG N 8,3 STEEL
8.4	75	117	118	25 – 30	STEEL	10	25203683	SPB DIN 338 HSSG N 8,4 STEEL
8.5	75	117	118	25 – 30	STEEL	10	25203537	SPB DIN 338 HSSG N 8,5 STEEL
8.6	81	125	118	25 – 30	STEEL	10	25203684	SPB DIN 338 HSSG N 8,6 STEEL
8.7	81	125	118	25 – 30	STEEL	10	25203685	SPB DIN 338 HSSG N 8,7 STEEL
8.8	81	125	118	25 – 30	STEEL	10	25203686	SPB DIN 338 HSSG N 8,8 STEEL
8.9	81	125	118	25 – 30	STEEL	10	25203687	SPB DIN 338 HSSG N 8,9 STEEL
9	75	125	118	25 – 30	STEEL	10	25203538	SPB DIN 338 HSSG N 9,0 STEEL
9.1	81	125	118	25 – 30	STEEL	10	25203688	SPB DIN 338 HSSG N 9,1 STEEL
9.2	81	125	118	25 – 30	STEEL	10	25203689	SPB DIN 338 HSSG N 9,2 STEEL
9.3	81	125	118	25 – 30	STEEL	10	25203690	SPB DIN 338 HSSG N 9,3 STEEL
9.4	81	125	118	25 – 30	STEEL	10	25203691	SPB DIN 338 HSSG N 9,4 STEEL
9.5	81	125	118	25 – 30	STEEL	10	25203539	SPB DIN 338 HSSG N 9,5 STEEL
9.6	87	133	118	25 – 30	STEEL	10	25203692	SPB DIN 338 HSSG N 9,6 STEEL
9.7	87	133	118	25 – 30	STEEL	10	25203693	SPB DIN 338 HSSG N 9,7 STEEL
9.8	87	133	118	25 – 30	STEEL	10	25203694	SPB DIN 338 HSSG N 9,8 STEEL
9.9	87	133	118	25 – 30	STEEL	10	25203695	SPB DIN 338 HSSG N 9,9 STEEL
10	87	133	118	25 – 30	STEEL	10	25203540	SPB DIN 338 HSSG N 10,0 STEEL
10.1	87	133	118	25 – 30	STEEL	5	25203696	SPB DIN 338 HSSG N 10,1 STEEL
10.2	87	133	118	25 – 30	STEEL	5	25203541	SPB DIN 338 HSSG N 10,2 STEEL
10.3	87	133	118	25 – 30	STEEL	5	25203697	SPB DIN 338 HSSG N 10,3 STEEL
10.4	87	133	118	25 – 30	STEEL	5	25203698	SPB DIN 338 HSSG N 10,4 STEEL
10.5	87	133	118	25 – 30	STEEL	5	25203542	SPB DIN 338 HSSG N 10,5 STEEL
10.6	94	133	118	25 – 30	STEEL	5	25203699	SPB DIN 338 HSSG N 10,6 STEEL
10.7	94	142	118	25 – 30	STEEL	5	25203700	SPB DIN 338 HSSG N 10,7 STEEL
10.8	87	142	118	25 – 30	STEEL	5	25203706	SPB DIN 338 HSSG N 10,8 STEEL
10.9	94	142	118	25 – 30	STEEL	5	25203707	SPB DIN 338 HSSG N 10,9 STEEL
11	94	142	118	25 – 30	STEEL	5	25203543	SPB DIN 338 HSSG N 11,0 STEEL

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d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Spiral angle β [°]	Version		Item no.	Designation
11.1	94	142	118	25 – 30	STEEL	5	25203708	SPB DIN 338 HSSG N 11,1 STEEL
11.2	94	142	118	25 – 30	STEEL	5	25203709	SPB DIN 338 HSSG N 11,2 STEEL
11.3	94	142	118	25 – 30	STEEL	5	25203710	SPB DIN 338 HSSG N 11,3 STEEL
11.4	94	142	118	25 – 30	STEEL	5	25203711	SPB DIN 338 HSSG N 11,4 STEEL
11.5	94	142	118	25 – 30	STEEL	5	25203544	SPB DIN 338 HSSG N 11,5 STEEL
11.6	94	142	118	25 – 30	STEEL	5	25203712	SPB DIN 338 HSSG N 11,6 STEEL
11.7	94	142	118	25 – 30	STEEL	5	25203713	SPB DIN 338 HSSG N 11,7 STEEL
11.8	94	142	118	25 – 30	STEEL	5	25203714	SPB DIN 338 HSSG N 11,8 STEEL
11.9	101	151	118	25 – 30	STEEL	5	25203715	SPB DIN 338 HSSG N 11,9 STEEL
12	101	151	118	25 – 30	STEEL	5	25203545	SPB DIN 338 HSSG N 12,0 STEEL
12.1	101	151	118	25 – 30	STEEL	5	25203716	SPB DIN 338 HSSG N 12,1 STEEL
12.2	101	151	118	25 – 30	STEEL	5	25203717	SPB DIN 338 HSSG N 12,2 STEEL
12.3	101	151	118	25 – 30	STEEL	5	25203718	SPB DIN 338 HSSG N 12,3 STEEL
12.4	101	151	118	25 – 30	STEEL	5	25203719	SPB DIN 338 HSSG N 12,4 STEEL
12.5	101	151	118	25 – 30	STEEL	5	25203546	SPB DIN 338 HSSG N 12,5 STEEL
12.6	101	151	118	25 – 30	STEEL	5	25203720	SPB DIN 338 HSSG N 12,6 STEEL
12.7	101	151	118	25 – 30	STEEL	5	25203721	SPB DIN 338 HSSG N 12,7 STEEL
12.8	101	151	118	25 – 30	STEEL	5	25203722	SPB DIN 338 HSSG N 12,8 STEEL
12.9	101	151	118	25 – 30	STEEL	5	25203818	SPB DIN 338 HSSG N 12,9 STEEL
13	101	151	118	25 – 30	STEEL	5	25203547	SPB DIN 338 HSSG N 13,0 STEEL
13.5	108	160	118	25 – 30	STEEL	1	25203723	SPB DIN 338 HSSG N 13,5 STEEL
14	108	160	118	25 – 30	STEEL	1	25203724	SPB DIN 338 HSSG N 14,0 STEEL
14.5	114	169	118	25 – 30	STEEL	1	25203725	SPB DIN 338 HSSG N 14,5 STEEL
15	114	169	118	25 – 30	STEEL	1	25203726	SPB DIN 338 HSSG N 15,0 STEEL
15.5	120	178	118	25 – 30	STEEL	1	25203727	SPB DIN 338 HSSG N 15,5 STEEL
16	120	178	118	25 – 30	STEEL	1	25203728	SPB DIN 338 HSSG N 16,0 STEEL
0.4	5	19	118	25 – 30	STEEL	10	25204000	SPB M2 1/64" STEEL
0.79	13	35	118	25 – 30	STEEL	10	25204001	SPB M2 1/32" STEEL
1.19	19	44	118	25 – 30	STEEL	10	25204002	SPB M2 3/64" STEEL
1.59	22	48	118	25 – 30	STEEL	10	25204003	SPB M2 1/16" STEEL
1.98	25	51	118	25 – 30	STEEL	10	25204004	SPB M2 5/64" STEEL
2.38	32	57	118	25 – 30	STEEL	10	25204005	SPB M2 3/32" STEEL
2.78	38	67	118	25 – 30	STEEL	10	25204006	SPB M2 7/64" STEEL
3.18	41	70	118	25 – 30	STEEL	10	25204007	SPB M2 1/8" STEEL
3.57	44	73	118	25 – 30	STEEL	10	25204008	SPB M2 9/64" STEEL
3.97	51	79	118	25 – 30	STEEL	10	25204009	SPB M2 5/32" STEEL
4.37	54	83	118	25 – 30	STEEL	10	25204010	SPB M2 11/64" STEEL
4.76	59	89	118	25 – 30	STEEL	10	25204011	SPB M2 3/16" STEEL
5.16	62	92	118	25 – 30	STEEL	10	25204012	SPB M2 13/64" STEEL
5.56	64	95	118	25 – 30	STEEL	10	25204013	SPB M2 7/32" STEEL
5.95	67	98	118	25 – 30	STEEL	10	25204014	SPB M2 15/64" STEEL
6.35	70	102	118	25 – 30	STEEL	10	25204015	SPB M2 1/4" STEEL
6.75	73	105	118	25 – 30	STEEL	10	25204016	SPB M2 17/64" STEEL
7.14	75	108	118	25 – 30	STEEL	10	25204017	SPB M2 9/32" STEEL
7.54	78	111	118	25 – 30	STEEL	10	25204018	SPB M2 19/64" STEEL
7.94	81	114	118	25 – 30	STEEL	10	25204019	SPB M2 5/16" STEEL
8.33	84	117	118	25 – 30	STEEL	10	25204020	SPB M2 21/64" STEEL
8.73	87	121	118	25 – 30	STEEL	10	25204021	SPB M2 11/32" STEEL
9.13	89	124	118	25 – 30	STEEL	10	25204022	SPB M2 23/64" STEEL
9.52	92	127	118	25 – 30	STEEL	10	25204023	SPB M2 3/8" STEEL
9.92	95	130	118	25 – 30	STEEL	10	25204024	SPB M2 25/64" STEEL
10.32	98	133	118	25 – 30	STEEL	5	25204025	SPB M2 13/32" STEEL
10.72	100	137	118	25 – 30	STEEL	5	25204026	SPB M2 27/64" STEEL
11.11	103	140	118	25 – 30	STEEL	5	25204027	SPB M2 7/16" STEEL

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$d_1$ [mm]	$l_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	Spiral angle $\beta$ [°]	Version		Item no.	Designation
11.51	106	143	118	25 – 30	STEEL	5	25204028	SPB M2 29/64" STEEL
11.91	110	146	118	25 – 30	STEEL	5	25204029	SPB M2 15/32" STEEL
12.3	111	149	118	25 – 30	STEEL	5	25204030	SPB M2 31/64" STEEL
12.7	114	152	118	25 – 30	STEEL	5	25204031	SPB M2 1/2" STEEL

### DIN 338 HSSG N STEEL spiral drills, 19-piece set

The set contains 19 HSS spiral drills in the STEEL in HSSG (M2) type for industrial uses.

#### Contents:

The set consists of 19 HSS spiral drills in the STEEL in HSSG (M2) version with dia. 1.0 to 10.0 mm, in increments of 0.5 mm.

#### Special features:

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.



Contents [Piece]	Version		Item no.	Designation
19	STEEL	1	25203701	SET SPB DIN 338 HSSG N 1-10 STEEL 19TLG

### DIN 338 HSSG N STEEL spiral drills, 25-piece set

The set contains 25 HSS spiral drills in the STEEL in HSSG (M2) type for industrial uses.

#### Contents:

The set consists of 25 HSS spiral drills with dia. 1.0 to 13.0 mm, in increments of 0.5 mm.

#### Special features:

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.



Contents [Piece]	Version		Item no.	Designation
25	STEEL	1	25203702	SET SPB DIN 338 HSSG N 1-13 STEEL 25TLG



### DIN 338 HSSG N STEEL spiral drills, 29-piece set

The set contains 29 HSS spiral drills in the STEEL in HSSG (M2) type for industrial uses.

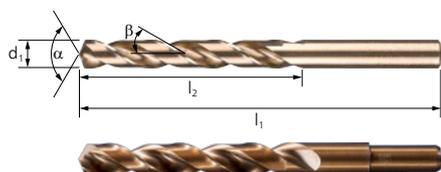
#### Contents:

The set consists of 29 HSS spiral drills in the STEEL in HSSG (M2) version with dia. 1.59 to 12.70 mm, in increments of 0.4 mm.

#### Special features:

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.

Contents [Piece]	Version		Item no.	Designation
29	STEEL	1	25204035	SET SPB M2 1/16-1/2" STEEL 29TLG



### DIN 338 HSSE N INOX spiral drill

High-performance drilling tools in the INOX in HSSE-Co5 (M35) version for industrial uses on tough and hard materials such as alloyed and high-strength steel and stainless steel (INOX). Fully ground, right-hand turning version with cross grinding. With dia. 13 x 35 mm stepped shank as from a drill dia. of 13.5 mm.

#### Special features:

- Very good temperature resistance due to Co content as well as robust tip profile.
- Very long tool life and easy centring.
- Good chip removal and high concentricity.

d <sub>1</sub> [mm]	l <sub>2</sub> [mm]	l <sub>1</sub> [mm]	α [°]	Spiral angle β [°]	Version		Item no.	Designation
1	12	34	135	36	INOX	10	25203548	SPB DIN 338 HSSE N 1,0 INOX
1.1	14	36	135	36	INOX	10	25203729	SPB DIN 338 HSSE N 1,1 INOX
1.2	16	38	135	36	INOX	10	25203730	SPB DIN 338 HSSE N 1,2 INOX
1.3	16	38	135	36	INOX	10	25203731	SPB DIN 338 HSSE N 1,3 INOX
1.4	18	40	135	36	INOX	10	25203732	SPB DIN 338 HSSE N 1,4 INOX
1.5	18	40	135	36	INOX	10	25203549	SPB DIN 338 HSSE N 1,5 INOX
1.6	20	43	135	36	INOX	10	25203550	SPB DIN 338 HSSE N 1,6 INOX
1.7	20	43	135	36	INOX	10	25203733	SPB DIN 338 HSSE N 1,7 INOX
1.8	22	46	135	36	INOX	10	25203734	SPB DIN 338 HSSE N 1,8 INOX
1.9	22	46	135	36	INOX	10	25203735	SPB DIN 338 HSSE N 1,9 INOX
2	24	49	135	36	INOX	10	25203551	SPB DIN 338 HSSE N 2,0 INOX
2.1	24	49	135	36	INOX	10	25203736	SPB DIN 338 HSSE N 2,1 INOX
2.2	27	53	135	36	INOX	10	25203737	SPB DIN 338 HSSE N 2,2 INOX
2.3	27	53	135	36	INOX	10	25203738	SPB DIN 338 HSSE N 2,3 INOX
2.4	30	57	135	36	INOX	10	25203739	SPB DIN 338 HSSE N 2,4 INOX
2.5	30	57	135	36	INOX	10	25203552	SPB DIN 338 HSSE N 2,5 INOX
2.6	30	57	135	36	INOX	10	25203740	SPB DIN 338 HSSE N 2,6 INOX
2.7	33	53	135	36	INOX	10	25203741	SPB DIN 338 HSSE N 2,7 INOX
2.8	33	61	135	36	INOX	10	25203742	SPB DIN 338 HSSE N 2,8 INOX
2.9	33	61	135	36	INOX	10	25203743	SPB DIN 338 HSSE N 2,9 INOX
3	33	61	135	36	INOX	10	25203553	SPB DIN 338 HSSE N 3,0 INOX
3.1	36	65	135	36	INOX	10	25203554	SPB DIN 338 HSSE N 3,1 INOX
3.2	36	65	135	36	INOX	10	25203744	SPB DIN 338 HSSE N 3,2 INOX
3.3	36	65	135	36	INOX	10	25203555	SPB DIN 338 HSSE N 3,3 INOX
3.4	39	70	135	36	INOX	10	25203556	SPB DIN 338 HSSE N 3,4 INOX
3.5	39	70	135	36	INOX	10	25203557	SPB DIN 338 HSSE N 3,5 INOX
3.6	39	70	135	36	INOX	10	25203558	SPB DIN 338 HSSE N 3,6 INOX

Continued on next page

$d_1$ [mm]	$l_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	Spiral angle $\beta$ [°]	Version		Item no.	Designation
3.7	39	70	135	36	INOX	10	25203745	SPB DIN 338 HSSE N 3,7 INOX
3.8	43	75	135	36	INOX	10	25203746	SPB DIN 338 HSSE N 3,8 INOX
3.9	43	75	135	36	INOX	10	25203747	SPB DIN 338 HSSE N 3,9 INOX
4	43	75	135	36	INOX	10	25203559	SPB DIN 338 HSSE N 4,0 INOX
4.1	43	75	135	36	INOX	10	25203560	SPB DIN 338 HSSE N 4,1 INOX
4.2	43	75	135	36	INOX	10	25203561	SPB DIN 338 HSSE N 4,2 INOX
4.3	47	80	135	36	INOX	10	25203748	SPB DIN 338 HSSE N 4,3 INOX
4.4	47	80	135	36	INOX	10	25203562	SPB DIN 338 HSSE N 4,4 INOX
4.5	47	80	135	36	INOX	10	25203563	SPB DIN 338 HSSE N 4,5 INOX
4.6	47	80	135	36	INOX	10	25203749	SPB DIN 338 HSSE N 4,6 INOX
4.7	47	86	135	36	INOX	10	25203750	SPB DIN 338 HSSE N 4,7 INOX
4.8	53	86	135	36	INOX	10	25203751	SPB DIN 338 HSSE N 4,8 INOX
4.9	53	86	135	36	INOX	10	25203752	SPB DIN 338 HSSE N 4,9 INOX
5	52	86	135	36	INOX	10	25203564	SPB DIN 338 HSSE N 5,0 INOX
5.1	52	86	135	36	INOX	10	25203565	SPB DIN 338 HSSE N 5,1 INOX
5.2	52	86	135	36	INOX	10	25203566	SPB DIN 338 HSSE N 5,2 INOX
5.3	52	86	135	36	INOX	10	25203567	SPB DIN 338 HSSE N 5,3 INOX
5.4	57	93	135	36	INOX	10	25203753	SPB DIN 338 HSSE N 5,4 INOX
5.5	57	93	135	36	INOX	10	25203568	SPB DIN 338 HSSE N 5,5 INOX
5.6	57	93	135	36	INOX	10	25203754	SPB DIN 338 HSSE N 5,6 INOX
5.7	57	93	135	36	INOX	10	25203755	SPB DIN 338 HSSE N 5,7 INOX
5.8	57	93	135	36	INOX	10	25203756	SPB DIN 338 HSSE N 5,8 INOX
5.9	57	93	135	36	INOX	10	25203757	SPB DIN 338 HSSE N 5,9 INOX
6	57	93	135	36	INOX	10	25203569	SPB DIN 338 HSSE N 6,0 INOX
6.1	63	101	135	36	INOX	10	25203758	SPB DIN 338 HSSE N 6,1 INOX
6.2	63	101	135	36	INOX	10	25203759	SPB DIN 338 HSSE N 6,2 INOX
6.3	63	101	135	36	INOX	10	25203760	SPB DIN 338 HSSE N 6,3 INOX
6.4	63	101	135	36	INOX	10	25203761	SPB DIN 338 HSSE N 6,4 INOX
6.5	63	101	135	36	INOX	10	25203570	SPB DIN 338 HSSE N 6,5 INOX
6.6	63	101	135	36	INOX	10	25203762	SPB DIN 338 HSSE N 6,6 INOX
6.7	63	101	135	36	INOX	10	25203763	SPB DIN 338 HSSE N 6,7 INOX
6.8	69	109	135	36	INOX	10	25203571	SPB DIN 338 HSSE N 6,8 INOX
6.9	69	109	135	36	INOX	10	25203764	SPB DIN 338 HSSE N 6,9 INOX
7	69	109	135	36	INOX	10	25203572	SPB DIN 338 HSSE N 7,0 INOX
7.1	69	109	135	36	INOX	10	25203765	SPB DIN 338 HSSE N 7,1 INOX
7.2	69	109	135	36	INOX	10	25203766	SPB DIN 338 HSSE N 7,2 INOX
7.3	69	109	135	36	INOX	10	25203767	SPB DIN 338 HSSE N 7,3 INOX
7.4	69	109	135	36	INOX	10	25203768	SPB DIN 338 HSSE N 7,4 INOX
7.5	69	109	135	36	INOX	10	25203573	SPB DIN 338 HSSE N 7,5 INOX
7.6	75	117	135	36	INOX	10	25203769	SPB DIN 338 HSSE N 7,6 INOX
7.7	75	117	135	36	INOX	10	25203770	SPB DIN 338 HSSE N 7,7 INOX
7.8	75	117	135	36	INOX	10	25203771	SPB DIN 338 HSSE N 7,8 INOX
7.9	75	117	135	36	INOX	10	25203772	SPB DIN 338 HSSE N 7,9 INOX
8	75	117	135	36	INOX	10	25203574	SPB DIN 338 HSSE N 8,0 INOX
8.1	75	117	135	36	INOX	10	25203773	SPB DIN 338 HSSE N 8,1 INOX
8.2	75	117	135	36	INOX	10	25203774	SPB DIN 338 HSSE N 8,2 INOX
8.3	75	117	135	36	INOX	10	25203775	SPB DIN 338 HSSE N 8,3 INOX
8.4	75	117	135	36	INOX	10	25203776	SPB DIN 338 HSSE N 8,4 INOX
8.5	75	117	135	36	INOX	10	25203575	SPB DIN 338 HSSE N 8,5 INOX
8.6	81	125	135	36	INOX	10	25203777	SPB DIN 338 HSSE N 8,6 INOX
8.7	81	125	135	36	INOX	10	25203778	SPB DIN 338 HSSE N 8,7 INOX
8.8	81	125	135	36	INOX	10	25203779	SPB DIN 338 HSSE N 8,8 INOX
8.9	81	125	135	36	INOX	10	25203780	SPB DIN 338 HSSE N 8,9 INOX
9	75	125	135	36	INOX	10	25203576	SPB DIN 338 HSSE N 9,0 INOX

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$d_1$ [mm]	$l_2$ [mm]	$l_1$ [mm]	$\alpha$ [°]	Spiral angle $\beta$ [°]	Version		Item no.	Designation
9.1	81	125	135	36	INOX	10	25203781	SPB DIN 338 HSSE N 9,1 INOX
9.2	81	125	135	36	INOX	10	25203782	SPB DIN 338 HSSE N 9,2 INOX
9.3	81	125	135	36	INOX	10	25203783	SPB DIN 338 HSSE N 9,3 INOX
9.4	81	125	135	36	INOX	10	25203784	SPB DIN 338 HSSE N 9,4 INOX
9.5	81	125	135	36	INOX	10	25203577	SPB DIN 338 HSSE N 9,5 INOX
9.6	87	133	135	36	INOX	10	25203785	SPB DIN 338 HSSE N 9,6 INOX
9.7	87	133	135	36	INOX	10	25203786	SPB DIN 338 HSSE N 9,7 INOX
9.8	87	133	135	36	INOX	10	25203787	SPB DIN 338 HSSE N 9,8 INOX
9.9	87	133	135	36	INOX	10	25203788	SPB DIN 338 HSSE N 9,9 INOX
10	87	133	135	36	INOX	10	25203578	SPB DIN 338 HSSE N 10,0 INOX
10.1	87	133	135	36	INOX	5	25203789	SPB DIN 338 HSSE N 10,1 INOX
10.2	87	133	135	36	INOX	5	25203579	SPB DIN 338 HSSE N 10,2 INOX
10.3	87	133	135	36	INOX	5	25203790	SPB DIN 338 HSSE N 10,3 INOX
10.4	87	133	135	36	INOX	5	25203791	SPB DIN 338 HSSE N 10,4 INOX
10.5	87	133	135	36	INOX	5	25203580	SPB DIN 338 HSSE N 10,5 INOX
10.6	87	133	135	36	INOX	5	25203792	SPB DIN 338 HSSE N 10,6 INOX
10.7	94	142	135	36	INOX	5	25203793	SPB DIN 338 HSSE N 10,7 INOX
10.8	94	142	135	36	INOX	5	25203794	SPB DIN 338 HSSE N 10,8 INOX
10.9	94	142	135	36	INOX	5	25203795	SPB DIN 338 HSSE N 10,9 INOX
11	94	142	135	36	INOX	5	25203581	SPB DIN 338 HSSE N 11,0 INOX
11.1	94	142	135	36	INOX	5	25203796	SPB DIN 338 HSSE N 11,1 INOX
11.2	94	142	135	36	INOX	5	25203797	SPB DIN 338 HSSE N 11,2 INOX
11.3	94	142	135	36	INOX	5	25203798	SPB DIN 338 HSSE N 11,3 INOX
11.4	94	142	135	36	INOX	5	25203799	SPB DIN 338 HSSE N 11,4 INOX
11.5	94	142	135	36	INOX	5	25203582	SPB DIN 338 HSSE N 11,5 INOX
11.6	94	142	135	36	INOX	5	25203800	SPB DIN 338 HSSE N 11,6 INOX
11.7	94	142	135	36	INOX	5	25203801	SPB DIN 338 HSSE N 11,7 INOX
11.8	94	142	135	36	INOX	5	25203802	SPB DIN 338 HSSE N 11,8 INOX
11.9	101	151	135	36	INOX	5	25203803	SPB DIN 338 HSSE N 11,9 INOX
12	101	151	135	36	INOX	5	25203583	SPB DIN 338 HSSE N 12,0 INOX
12.1	101	151	135	36	INOX	5	25203804	SPB DIN 338 HSSE N 12,1 INOX
12.2	101	151	135	36	INOX	5	25203805	SPB DIN 338 HSSE N 12,2 INOX
12.3	101	151	135	36	INOX	5	25203806	SPB DIN 338 HSSE N 12,3 INOX
12.4	101	151	135	36	INOX	5	25203807	SPB DIN 338 HSSE N 12,4 INOX
12.5	101	151	135	36	INOX	5	25203584	SPB DIN 338 HSSE N 12,5 INOX
12.6	101	151	135	36	INOX	5	25203808	SPB DIN 338 HSSE N 12,6 INOX
12.7	101	151	135	36	INOX	5	25203809	SPB DIN 338 HSSE N 12,7 INOX
12.8	101	151	135	36	INOX	5	25203810	SPB DIN 338 HSSE N 12,8 INOX
12.9	101	151	135	36	INOX	5	25203811	SPB DIN 338 HSSE N 12,9 INOX
13	101	151	135	36	INOX	5	25203585	SPB DIN 338 HSSE N 13,0 INOX
13.5	108	160	135	36	INOX	1	25203812	SPB DIN 338 HSSE N 13,5 INOX
14	108	160	135	36	INOX	1	25203813	SPB DIN 338 HSSE N 14,0 INOX
14.5	114	169	135	36	INOX	1	25203814	SPB DIN 338 HSSE N 14,5 INOX
15	114	169	135	36	INOX	1	25203815	SPB DIN 338 HSSE N 15,0 INOX
15.5	120	178	135	36	INOX	1	25203816	SPB DIN 338 HSSE N 15,5 INOX
16	120	178	135	36	INOX	1	25203817	SPB DIN 338 HSSE N 16,0 INOX





### DIN 338 HSSE N INOX spiral drills, 19-piece set

The set contains 19 HSS spiral drills in the INOX in HSSE-Co5 (M35) type for industrial uses.

**Contents:**

The set consists of 19 HSS spiral drills with dia. 1.0 to 10.0 mm, in increments of 0.5 mm.

**Special features:**

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.

Contents [Piece]	Version		Item no.	Designation
19	INOX	1	25203703	SET SPB DIN 338 HSSE N 1-10 INOX 19TLG



### DIN 338 HSSG N STEEL spiral drills, 21-piece set

The set contains 21 HSS spiral drills in the STEEL in HSSG (M2) type for industrial uses.

**Contents:**

The set consists of 21 HSS spiral drills in the STEEL in HSSG (M2) version with dia. 1.59 to 9.53 mm, in increments of 0.4 mm.

**Special features:**

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.

Contents [Piece]	Version		Item no.	Designation
21	STEEL	1	25204034	SET SPB M2 1/16-3/8"STEEL 19TLG



### DIN 338 HSSE N INOX spiral drills, 25-piece set

The set contains 25 HSS spiral drills in the INOX in HSSE-Co5 (M35) type for industrial uses.

**Contents:**

The set consists of 25 HSS spiral drills with dia. 1.0 to 13.0 mm, in increments of 0.5 mm.

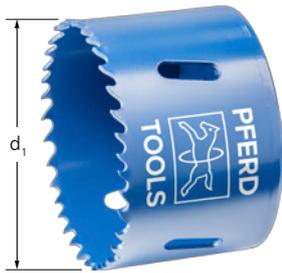
**Special features:**

- The sturdy plastic box protects the tools against dirt and damage.
- The securing of the HSS spiral drills facilitates the selection and withdrawal of the tools.

Contents [Piece]	Version		Item no.	Designation
25	INOX	1	25203704	SET SPB DIN 338 HSSE N 1-13 INOX 25TLG

# HSS hole saws, sets and accessories

## HSS hole saws



### HSS hole saws

Hole saws made of tough, shatter-proof, sturdy HSS bimetal for cost-effectively cutting out holes. The saw teeth are made of high-quality M42 (Co8) material.



#### Special features:

- High concentricity, and chattering during sawing is prevented by the alternating tooth pitch.
- Good chip removal.
- The hole saw is conveniently centred and guided via the replaceable HSS pilot drill.



d <sub>1</sub> [mm]	Max. cutting depth [mm]	Opt. RPM steel	Opt. RPM stainless steel (INOX)	Opt. RPM non-ferrous metals	Opt. RPM plastics		Item no.	Designation
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#### Thread version 1/2-20 UNF, suitable arbors LSS 1, LSS 4 or quick-mounting system PSL

16	34	550	275	880	880	1	25100116	LS 16
17	36	520	260	820	820	1	25100117	LS 17
19	36	460	230	740	740	1	25100119	LS 19
20	36	425	210	700	700	1	25100220	LS 20
22	36	390	195	640	640	1	25100322	LS 22
25	36	350	175	560	560	1	25100425	LS 25
27	36	325	160	520	520	1	25100527	LS 27
29	36	300	150	480	480	1	25100629	LS 29
30	36	285	145	470	470	1	25100730	LS 30

#### Thread version 5/8-18 UNF, suitable arbor LSS 2 or quick-mounting system PSL

32	36	275	140	440	440	1	25100832	LS 32
35	36	250	125	400	400	1	25101035	LS 35
37	36	235	115	370	370	1	25101137	LS 37
38	36	230	115	370	370	1	25101138	LS 38
40	36	215	110	350	350	1	25101240	LS 40
41	36	210	105	340	340	1	25101241	LS 41
44	31	195	95	320	320	1	25101344	LS 44
48	31	180	90	290	290	1	25101448	LS 48
51	31	170	85	270	270	1	25101551	LS 51
52	31	165	80	270	270	1	25101552	LS 52
54	31	160	80	260	260	1	25101654	LS 54
57	31	150	75	250	250	1	25101757	LS 57
60	31	140	70	230	230	1	25101860	LS 60
64	31	135	65	220	220	1	25101963	LS 64
65	31	135	65	220	220	1	25101965	LS 65
67	31	130	65	210	210	1	25102067	LS 67
70	31	125	60	200	200	1	25102170	LS 70
73	31	120	60	190	190	1	25102273	LS 73
76	31	115	55	180	180	1	25102376	LS 76
79	31	110	55	180	180	1	25102479	LS 79
83	31	105	50	170	170	1	25102583	LS 83
86	31	100	50	160	160	1	25102586	LS 86
89	31	95	45	160	160	1	25102689	LS 89
92	31	95	45	150	150	1	25102792	LS 92
95	31	90	45	150	150	1	25102895	LS 95
102	31	85	40	140	140	1	25102912	LS 102
105	31	80	40	130	130	1	25103015	LS 105

Continued on next page

# HSS hole saws, sets and accessories

## HSS hole saws

d, [mm]	Max. cutting depth [mm]	Opt. RPM steel	Opt. RPM stainless steel (INOX)	Opt. RPM non-ferrous metals	Opt. RPM plastics		Item no.	Designation
111	31	75	35	130	130	1	25103111	LS 111
114	31	75	35	120	120	1	25103114	LS 114
121	31	70	35	120	120	1	25103221	LS 121
127	31	65	30	110	110	1	25103227	LS 127
140	31	60	30	100	100	1	25103440	LS 140
152	31	55	25	90	90	1	25103552	LS 152

## HSS hole saw sets



### Set for electricians (international standard sizes)

The set contains six HSS hole saws in the most common international diameters, including accessories, for electricians. Operating instructions are included.

#### Contents:

The set consists of six HSS hole saws: LS 22, LS 29, LS 35, LS 44, LS 51 and LS 64, two hole saw arbors: LSS 2 and LSS 4, an LSA adapter for hole saw arbor LSS 4, an Allen key 4 mm and an ejection spring.

#### Special features:

- It is possible to use hole saw LS 35 with the LSA adapter and washer.
- Supplied in well-arranged plastic box which protects against dirt and damage.

L [mm]	B [mm]	H [mm]		Item no.	Designation
310	260	80	1	25900910	SET LS-SO 9E-1 10TLG



### Set for electricians 20–64

The set contains nine HSS hole saws in the most common diameters, including accessories, for electricians. Operating instructions are included.

#### Contents:

The set consists of nine HSS hole saws: LS 20, LS 22, LS 25, LS 32, LS 40, LS 44, LS 51, LS 57 and LS 64, two hole saw arbors: LSS 2 and LSS 4, an LSA adapter for hole saw arbor LSS 4, a pilot drill LSB 6/90, an Allen key 4 mm and an ejection spring.

#### Special features:

- It is possible to use hole saw LS 32 with the LSA adapter and washer.
- Supplied in well-arranged plastic box which protects against dirt and damage.

L [mm]	B [mm]	H [mm]		Item no.	Designation
310	260	80	1	25900020	SET LS-SO 13E-2 20-64



### Set for fitters 41–111

The set contains six HSS hole saws in the most common diameters, including accessories, for plumbers and sanitary engineers. Operating instructions are included.

#### Contents:

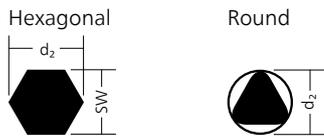
The set consists of six HSS hole saws: LS 41, LS 51, LS 57, LS 73, LS 86 and LS 111, a hole saw arbor LSS 2, a pilot drill LSB 6/60, an Allen key 4 mm and an ejection spring.

#### Special features:

- Supplied in well-arranged plastic box which protects against dirt and damage.

L [mm]	B [mm]	H [mm]		Item no.	Designation
310	260	80	1	25999902	SET LS-SO 10 PLUMB 41-111

### Shank dimensions [mm]



### Example combination

- ① HSS hole saw
- ② Adapter
- ③ Quick-mounting system
- ④ HSS hole saw with adapter and quick-mounting system



### Hole saw arbors LSS

Hole saw arbors are designed for mounting the hole saw and the pilot drill. The hole saw arbors are supplied with an HSS pilot drill and an ejection spring.

#### Special features:

- The spring can easily be removed manually without the help of tools.

Image	Suitable for hole saws	Suitable pilot drill	d <sub>2</sub> [mm]	Size [mm]	Shank type	Thread		Item no.	Designation
①	LS 14-30	LSB 6/60	10.5	9.53	hexagonal	1/2-20 UNF	1	25200111	LSS 1
②	LS 32-210	LSB 6/60	10.5	9.53	hexagonal	5/8-18 UNF	1	25200211	LSS 2
③	LS 14-30	LSB 6/90	6.35	-	round	1/2-20 UNF	1	25200407	LSS 4



### Screws for hole saw arbors LSS

Replacement screws for hole saw arbor LSS 2.

	Item no.	Designation
1	28901014	ES LSS-2





### Quick-mounting system for hole saws

The quick-mounting system is part of a clamping system for the quick and easy use of HSS hole saws. In conjunction with adapters, it is possible to use the HSS hole saws easily and conveniently on all conventional power drills.

#### Special features:

- 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.

Suitable for hole saws	Shank type	d <sub>2</sub> [mm]	Size [mm]		Item no.	Designation
LS 14–210	hexagonal	12.2	11	1	25200900	PSL 11



### Adapter for hole saws

Adapters tailored to the hole saw diameters.

Image	Suitable for hole saws		Item no.	Designation
①	LS 14-30	1	25200910	AD-PSL 14-30
②	LS 32-210	1	25200920	AD-PSL 32-210



### HSS pilot drill LSB

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

Image	Suitable for hole saws	Suitable shanks	Suitable for quick-mounting system	d <sub>2</sub> [mm]	l <sub>1</sub> [mm]	Shank type		Item no.	Designation
①	LS 14–210	LSS 1, LSS 2	-	6.35	60	round	1	25202005	LSB 6/60
②	LS 14–210	LSS 4	PSL 11	6.35	90	round	1	25202007	LSB 6/90



### 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 shanks		Item no.	Designation
LS 32-38	LSS 1, LSS 4	1	25203001	LSA