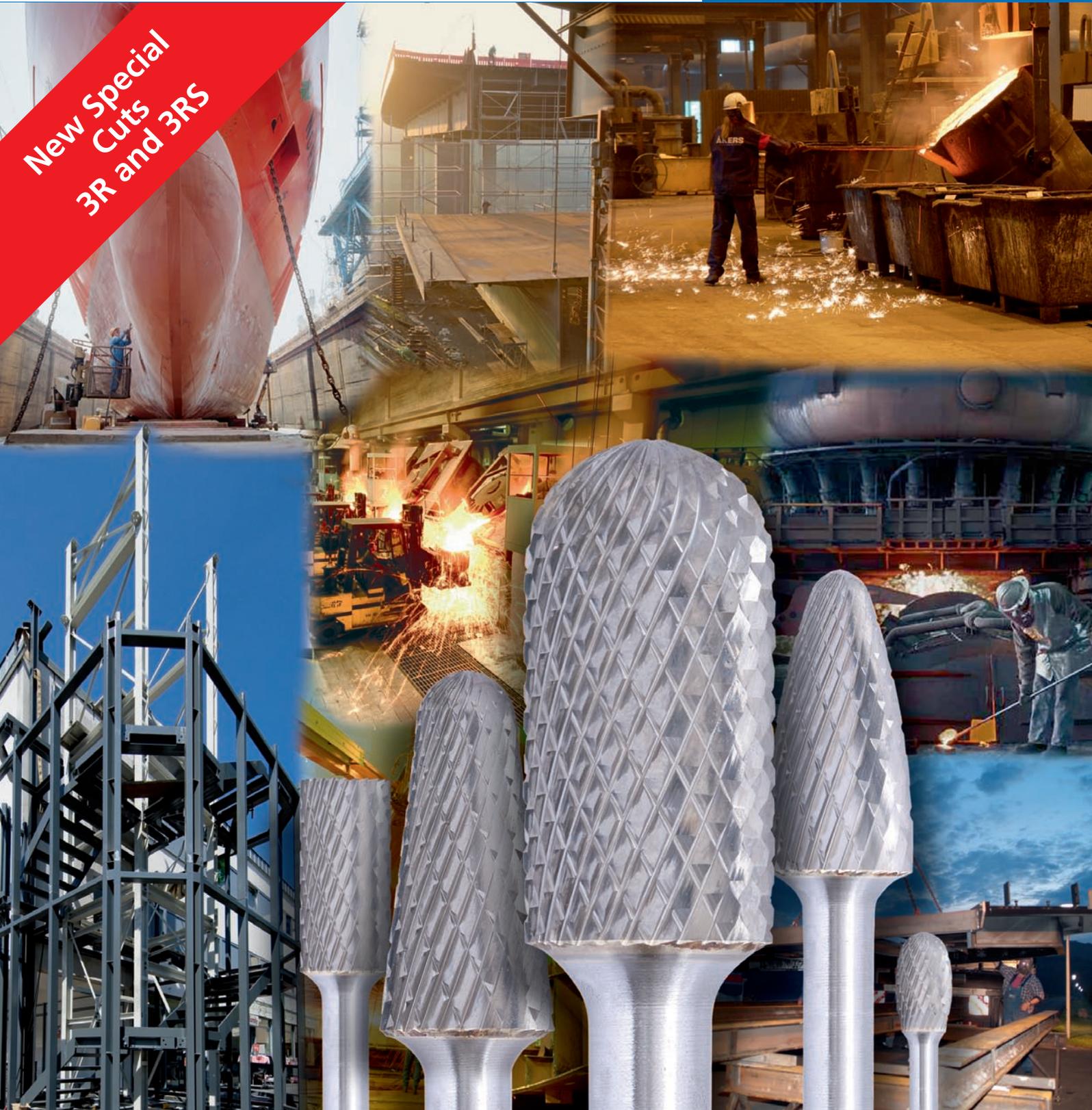


# Tungsten Carbide Burrs for Tough Applications

Special Performance in Foundry, Shipbuilding  
and Steel Construction Applications



New Special  
Cuts  
3R and 3RS



- New, innovative special cuts providing exceptional impact resistance
- Highly rugged cut patterns minimize tooth chipping/breakage, splintering and burr head failures
- Developed specifically for applications involving high impact loads, the new 3R and 3RS cuts are the latest addition to the existing PFERD range

# Tungsten Carbide Burrs for Tough Applications

New in the PFERD Range: Innovative High-Performance Cuts

For heavy-duty applications in shipyards, foundries and steel construction, PFERD has developed two new special cut patterns for its tungsten carbide burrs.

The new 3R and 3RS cuts represent a new PFERD product line designed especially for tough operating conditions. These tungsten carbide burrs are characterized by their exceptional impact resistance and performance. The new cuts are ideal for all uses involving high mechanical shock or impact loads. Susceptibility to tooth chipping/breakage, splintering

and burr head cracking has been effectively minimized. Even when milling at low RPM with an only moderately powerful machine, the occurrence of tooth failures is markedly reduced.

Like all other PFERD quality burrs, our 3R and 3RS cut types distinguish themselves by their perfectly matched tooth geometry, number of teeth, helix angle, rake angle, and concentricity. Thanks to a very high stock removal capability over the entire service life, these tools deliver outstanding results in minimum time.

The new 3R and 3RS cuts are the latest addition to the existing PFERD range. They are not intended as substitutes for our proven standard cuts for general-use burrs.

For the complete line of tungsten carbide burrs please refer to our PFERD catalogue 202, which we shall be glad to send to you upon request!

## The new 3R and 3RS cut patterns minimize tooth breakage on tungsten carbide burrs

### Problem

Chipping, tooth failures and major burr damage are sometimes encountered in applications involving high impact loads.

Thanks to perfectly matched production parameters, the new 3R and 3RS cut patterns will substantially reduce tooth failures on tungsten carbide burrs.

### Solutions and advantages

#### Cut 3R



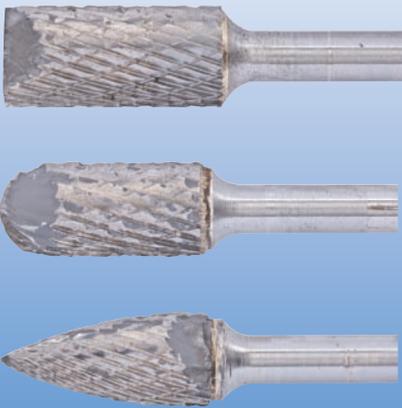
- Cross cut.
- **Coarse and aggressive machining with high stock removal, even at low RPM.**

#### Cut 3RS



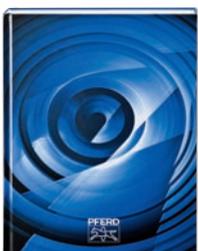
- Cross cut.
- **Coarse machining with smoother burr operation, even at low RPM.**
- **Less aggressive than 3R cut.**

### Tooth chipping / failure



### Distribution in single-burr packs

Tungsten carbide burrs featuring the new 3R and 3RS cut patterns are supplied in single-unit packs. The proven plastic box ensures an optimum protection of burr teeth.



### The original PFERD Tool Manual!

With more information on tungsten carbide burrs and more than 7,500 innovative solutions for surface processing and cutting materials.

Request your own free personal copy at [www.pferd.com](http://www.pferd.com)

Material Groups		Application	Cut	Recommended cutting rate
Non-hardened, non-heat treated steels up to 1200 N/mm <sup>2</sup> (< 35 HRC)	Constructional steels Carbon steels Tool steels Non-alloyed steels Case-hardened steels, Steel castings	Coarse machining = high stock removal with impact loading	3R	250 - 600 m/min
			3RS	250 - 600 m/min
Hardened, heat-treated steels exceeding 1200 N/mm <sup>2</sup> (> 35 HRC)	Tool steels Tempering steels Alloyed steels Steel castings	Coarse machining = high stock removal with impact loading	3R	250 - 350 m/min
			3RS	250 - 350 m/min
Cast iron	Grey cast iron Spheroidal graphite cast iron	Coarse machining = high stock removal with impact loading	3R	250 - 600 m/min
			3RS	250 - 600 m/min

### Recommended rotational speeds (RPM) for tungsten carbide burrs for tough applications

See the table across for the recommended rotational speeds (RPM) of burrs in the various diameters.

Note that optimum RPM is a function of the cutting rate (m/min) as indicated in the table.

#### Example:

Tungsten carbide burr, cut 3R,  
12 mm head diameter,  
coarse machining of non-hardened and non heat-treated steels.  
Cutting rate: 250 - 600 m/min  
**Rotational speed: 7,000 - 16,000 RPM**

m/min ∅ mm	Cutting rate (m/min)					
	250	300	350	450	500	600
Rotational speed (RPM)						
8	10,000	12,000	14,000	18,000	20,000	24,000
10	8,000	10,000	11,000	14,000	16,000	19,000
12	7,000	8,000	9,000	12,000	13,000	16,000
16	5,000	6,000	7,000	9,000	10,000	12,000

### Safety notes



= Wear safety goggles!



= Use ear protection!



= Observe safety recommendations!

For safety reasons, **tungsten carbide burrs with longer shafts** must be operated at substantially lower RPM levels (refer also to page 7).

Use only **rigid clamping systems and power tools** to avoid safety hazards!

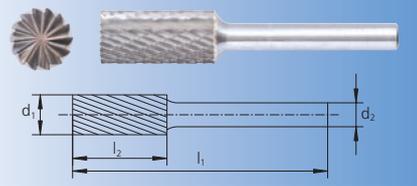


# Tungsten Carbide Burrs for Tough Applications

## Standard Shapes



### Cylindrical shape with end cut ZYAS



Cylindrical burr according to DIN 8032 (shape ZYAS) with circumferential.

#### Application

Interior contour work, i.e., peripheral and face milling

#### Ordering example:

EAN 4007220**769997**  
ZYAS 0820/6 C3R



Order No.	Cut	Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Overall length $l_1$ [mm]		
	3R					
	EAN 4007220					

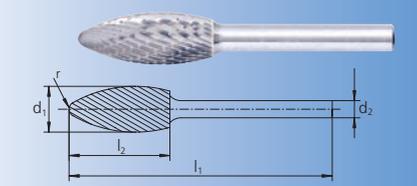
Shank  $\varnothing$  6 mm

ZYAS 0820/6	769997	6	8 x 20	60	1	25
ZYAS 1020/6	770023	6	10 x 20	60	1	33
ZYAS 1225/6	869109	6	12 x 25	65	1	55

Shank  $\varnothing$  8 mm

ZYAS 1225/8	770054	8	12 x 25	65	1	56
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### Flame shape B



Flame shape burr.

#### Application

Contouring

#### Ordering example:

EAN 4007220**770061**  
B 0820/6 C3R



Order No.	Cut	Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Overall length $l_1$ [mm]		
	3R					
	EAN 4007220					

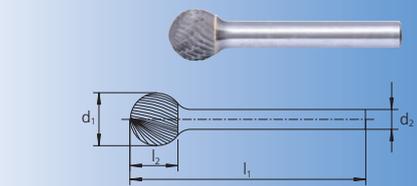
Shank  $\varnothing$  6 mm

B 0820/6	770061	6	8 x 20	60	1	22
B 1230/6	770085	6	12 x 30	70	1	48

Shank  $\varnothing$  8 mm

B 1230/8	770092	8	12 x 30	70	1	48
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### Ball shape KUD



Ball-shaped burr according to DIN 8032 (shape KUD).

#### Application

Contouring, bore deburring, milling in preparation of build-up welding

#### Ordering example:

EAN 4007220**770160**  
KUD 1210/6 C3R



Order No.	Cut	Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Overall length $l_1$ [mm]		
	3R					
	EAN 4007220					

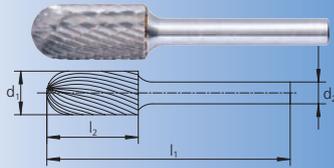
Shank  $\varnothing$  6 mm

KUD 1210/6	770160	6	12 x 10	50	1	30
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Shank  $\varnothing$  8 mm

KUD 1210/8	770177	8	12 x 10	50	1	35
KUD 1614/8	770184	8	16 x 14	54	1	53

### Cylindrical shape with radius end WRC



General-use shape (combination of cylindrical and spherical geometries) in accordance with DIN 8032 (shape WRC).

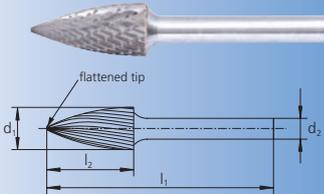
**Application**  
Surface milling, contouring

**Ordering example:**  
EAN 4007220**770108**  
WRC 0820/6 C3R



Order No.	Cuts		Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Overall length $l_1$ [mm]		
	3R	3RS					
<b>EAN 4007220</b>							
Shank $\varnothing$ 6 mm							
WRC 0820/6	770108	-	6	8 x 20	60	1	25
WRC 1020/6	770115	-	6	10 x 20	60	1	32
WRC 1225/6	770122	770139	6	12 x 25	65	1	52
Shank $\varnothing$ 8 mm							
WRC 1225/8	769881	770153	8	12 x 25	65	1	59

### Pointed tree shape SPG



Bullet-shaped burr according to DIN 8032 (shape SPG).

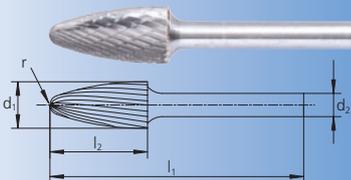
**Application**  
Work on narrow contours, Milling of acute-angled surfaces

**Ordering example:**  
EAN 4007220**770252**  
SPG 1020/6 C3R



Order No.	Cuts		Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Overall length $l_1$ [mm]		
	3R	3RS					
<b>EAN 4007220</b>							
Shank $\varnothing$ 6 mm							
SPG 1020/6	770252	770269	6	10 x 20	60	1	25
SPG 1225/6	770276	-	6	12 x 25	65	1	40
Shank $\varnothing$ 8 mm							
SPG 1225/8	770283	-	8	12 x 25	65	1	47
SPG 1625/8	770290	770306	8	16 x 25	65	1	64

### Tree shape with radius end RBF



Tree-shaped burr according to DIN 8032 (shape RBF).

**Application**  
Work on narrow workpiece contours

**Ordering example:**  
EAN 4007220**770191**  
RBF 0820/6 C3R



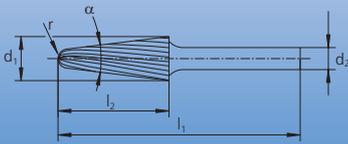
Order No.	Cuts		Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Radius $r$ [mm]	Overall length $l_1$ [mm]		
	3R	3RS						
<b>EAN 4007220</b>								
Shank $\varnothing$ 6 mm								
RBF 0820/6	770191	-	6	8 x 20	1,2	60	1	21
RBF 1020/6	770207	-	6	10 x 20	2,5	60	1	28
RBF 1225/6	770214	770238	6	12 x 25	2,5	65	1	43
Shank $\varnothing$ 8 mm								
RBF 1225/8	770221	770245	8	12 x 25	2,5	65	1	49

# Tungsten Carbide Burrs for Tough Applications

## Standard Shapes



### Conical shape with radius end KEL



Taper burr with radius end according to DIN 8032 (shape KEL).  
Angle  $\alpha = 14^\circ$

#### Application

Work on narrow workpiece contours and surfaces

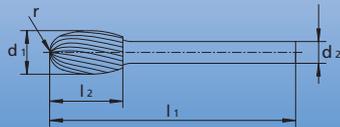
#### Ordering example:

EAN 4007220**770320**  
KEL 1225/6 C3R



Order No.	Cut		Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Radius $r$ [mm]	Overall length $l_1$ [mm]		
	3R	EAN 4007220						
Shank $\varnothing$ 6 mm								
KEL 1225/6	770320		6	12 x 25	3,3	65	1	39
Shank $\varnothing$ 8 mm								
KEL 1225/8	770337		8	12 x 25	3,3	65	1	47

### Oval shape TRE



Oval burr according to DIN 8032 (shape TRE).

#### Application

Contouring

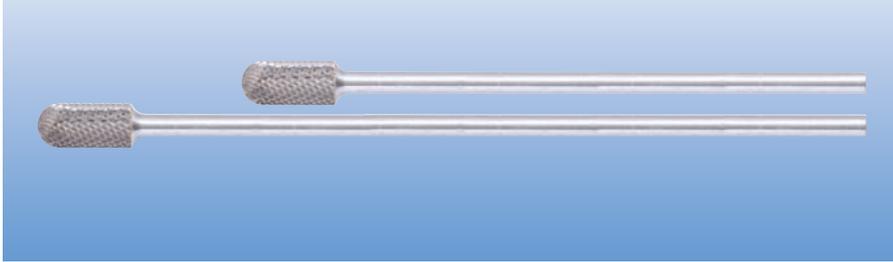
#### Ordering example:

EAN 4007220**770344**  
TRE 1016/6 C3R



Order No.	Cuts		Shank dia. $d_2$ [mm]	Burr dia. x length $d_1 \times l_2$ [mm]	Radius $r$ [mm]	Overall length $l_1$ [mm]		
	3R	3RS						
Shank $\varnothing$ 6 mm								
TRE 1016/6	770344	770382	6	10 x 16	4,0	56	1	27
TRE 1220/6	770351	-	6	12 x 20	5,0	60	1	41
Shank $\varnothing$ 8 mm								
TRE 1220/8	770368	-	8	12 x 20	5,0	60	1	48

### Tungsten Carbide Burrs with Special Shank Lengths



### Long shank versions – available on request

Tungsten carbide burrs for tough applications are optionally available in 150 and 200 mm shank lengths. These tools are particularly well suited for use in hard-to-reach areas. Because of their high impact-resistance characteristics they represent an optimum combination of a tungsten carbide burr and a long shank or shank extension, respectively. Shanks may also be cut to length by the user.

### Safety notes

Special-length burrs and burrs with long shanks must be placed on the workpiece (or inserted in the bore or slot to be machined) before the machine is powered up. As a rule, the tool ought to remain in contact with the workpiece for as long as the machine is running. Failure to observe this procedure may result in shank failure and hence, an increased accident risk

For safety reasons, **tungsten carbide burrs with longer shafts** must be operated at substantially lower RPM levels. Use only **rigid clamping systems and power tools**, respectively, to avoid safety hazards!



### Drive spindle extensions

For work in hard-to-reach areas (e.g., in pipes and ducting), burrs may also be combined with a spindle extension. The extension is mounted in the collet chuck of the machine (air-powered or electric), or in the handpiece of the flexible shaft.

Spindle extensions are a low-cost alternative to buying extra burrs.

### Important!

**Applicable safety regulations and accident prevention rules must be duly observed when using drive spindle extensions!**

#### Extension SPV 100-8



#### Extension for 6 mm shanks.

- n max. = 20,000 RPM
- including 6 mm collet, collet group 10, PFERD Tool Manual, catalogue 209



**Burr ZYA**  
with shank extension SPV 100-8

Order No.	EAN 4007220	Shank dia. [mm]	Shank length [mm]	Tool mount bore dia. [mm]	Overall length [mm]		
871.00.357	185261	8	30	6	144	1	115

#### Extension SPV 75-8



#### Extension for 6 mm shanks.

- n max. = 20,000 RPM
- including 6 mm collet, collet group 10, PFERD Tool Manual, catalogue 209



**Burr ZYA**  
with shank extension SPV 75-8

Order No.	EAN 4007220	Shank dia. [mm]	Shank length [mm]	Tool mount bore dia. [mm]	Overall length [mm]		
871.00.358	185278	8	30	6	120	1	90

# Tungsten Carbide Burrs for Tough Applications

## Suitable Tool Drives



An optimum match between tool and power source is a necessary condition for the cost-efficient use of PFERD rotary tools.

Addressing diverse materials, workpieces and machining operations, PFERD offers a broad diversity of combination options based on three different tool drive systems:

- Air-powered machines
- Electric machines
- Flexible shaft drives

**Straight air grinders** of lengthened design, with steel housing, are particularly suitable for heavy-duty milling in hard-to-reach spots. These machines provide accurate tool control. PFERD supplies straight air grinders which, in terms of output RPM, perfectly match the recommended cutting rates for our new special cut patterns.

Powerful **straight electric grinders** with stepless speed control are ideally suited for mobile use thanks to their compact and rugged design.

PFERD offers **flexible shaft drives** based on universal motors or three-phase a.c. machines designed for free-standing, suspended or mobile operation.

The output speeds (RPM) of these machines are variable either steplessly\*<sup>1</sup> or in steps\*<sup>2</sup>. The overdrive unit ST 103, with its 1:3 transmission ratio, provides tool speeds of up to 36,000 RPM.

For further information and a full description of our entire range of tool drives please refer to our PFERD Tool Manual, catalogue 209, and our "New in the PFERD Range - 2011" brochure.

### Straight air grinders

#### PG 8/220 V-HV

Speed: 22.000 RPM  
Power: 600 W



#### PG 10/200 V-HV

Speed: 20.000 RPM  
Power: 900 W



#### PG 10/160 V-HV

Speed: 16.000 RPM  
Power: 900 W



#### PG 12/120 V-HV

Speed: 12.000 RPM  
Power: 1.000 W



#### PWS 5/160 HV

Speed with oil: 16.000 RPM  
Power with oil: 370 W  
Speed without oil: 13.000 RPM  
Power without oil: 340 W



#### PG 8/50 V-HV

Speed: 5.000 RPM  
Power: 600 W



### Straight electric grinders

#### UGER 11/330 SI

Speed: 15.000-33.000 RPM  
Power: 650 W



#### UGER 5/90 SI

Speed: 4.000-9.000 RPM  
Power: 500 W



### Flexible shaft drives\*<sup>3</sup>

#### Multi-Speed Machine Mammoth Electronic ME 22/150\*<sup>1</sup>

Speed: 0-15.000 RPM  
Power: 2.700 W



#### Multi-Speed Machine Mammoth MD 10\*<sup>2</sup>

Speed: 850-12.000 RPM  
Power: 1.000 W



#### Multi-Speed Machine RUER 10/250 SI\*<sup>2</sup>

Speed: 11.000-25.000 RPM  
Power: 1.050 W



\*<sup>3</sup> with flexible shaft

Order No.	Illustration	Rotational speed [RPM]	Power [W]
7 ZG DIN 10		11.000-25.000	800-1.760
10 ZG DIN 10		750-18.000	140-2.450

Printed in Germany.

Subject to technical modification.

04/2011

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