



Advanced Diamond Products

Diamond & CBN grinding wheels



Diamond & CBN grinding wheels

We are a leading supplier of diamond and CBN grinding wheels, with nearly 30 years of experience in the diamond tooling industry. Many industries, including metalworking, electronic, plastic, ophthalmic, ceramic and the glass industry use our products.

Diamond & CBN grinding wheels can be provided with:

- resin binder
- metal binder
- ceramic binder
- polyamide binder
- hybrid binder (copper/resin)

The diamond wheels are used for grinding tungsten carbides, flame-sprayed wear resistant alloys, tungsten carbide/steel combinations, glass, ceramics and ferrites.

The CBN wheels are used for grinding high speed steels, hardened steels (incl. 12% chromium) and flame-sprayed wear resistant alloys.

We can also provide electroplated Diamond & CBN tools.

Concentrations for diamond and CBN

The effect of concentration

Concentration	Percentage vol.	Carats per cm ³
25	6.25	1.1
40	10	1.76
50	12.5	2.2
75	18.75	3.3
100	25	4.4
150	37.5	6.6
175	43.75	7.7

We use the same indication of concentration for both diamond and CBN, which corresponds to the internationally accepted standard for:

Concentration 100 = 4.4 crt/cm³ (1 Carat = 0.2 g)

This is used to express the weight of DIAMOND or CBN per cm³.

Concentrations

The content of diamond or CBN in the grinding rim is heavily dependent upon the application. Generally, where rapid stockremoval of tungsten carbide or hardened steel is intended, a concentration of 75 to 125 is selected. When a good surface finish is demanded, lower concentrations in combination with finer diamond or CBN powder are required.

Concentrations of up to 150 are used for profile grinding wheels and cylindrical wheels which have a small contact area.

We guarantee the specified concentrations

Grit size

Diamond and CBN grit are available in many sizes and types. The gritsize is dependent upon the desired surface finish. In addition, the gritsize also has an important effect on the grinding behaviour of the wheel.

You will find a comparison table for the various grit systems at the backpage of this leaflet.

Binders

We have a large number of in house developed binders available. The type of binder is often selected in combination with the type of grit and concentration. Binders are divided into metal, resin, polyamide, hybrid and ceramic binders.

Solid metal binders are often applied to grind glass and ceramics, whereas resin binders, porous metal binders and ceramic binders are usually used for grinding tungsten carbides and hardened steel.

The following more or less "universal" binder codes are used:

XX	Wet grinding of carbide
X2	Dry grinding of carbide
C2	Dry and wet grinding of carbide and hardened steel
T2	Dry and wet grinding of hardened steel with cylindrical wheels
T3	Dry and wet grinding of hardened steel with cup wheels
CU	Wet CNC grinding of carbide and hardened steel
GTPO	Polyamide binder for wet CNC grinding of carbide and hardened steel
GTHY	hybrid binder for wet CNC grinding of carbide and hardened steel
GS30 (GR)	Wet grinding of flat glass
S149	Wet grinding of optical glass

Ceramic binder

V-number Wet grinding of tungsten carbide, HSS, etc.

Cutting depth for diamond and CBN grinding wheels

The depth of cutting for oscillating grinding with forced feeding is associated with the grit size of the wheel and the fineness required for the surface. The depth of cut must always be less than the protrusion of the grit from the binder. For a sharp grinding wheel the protrusion will be 1/4 to 1/5 of the grit size at the most.

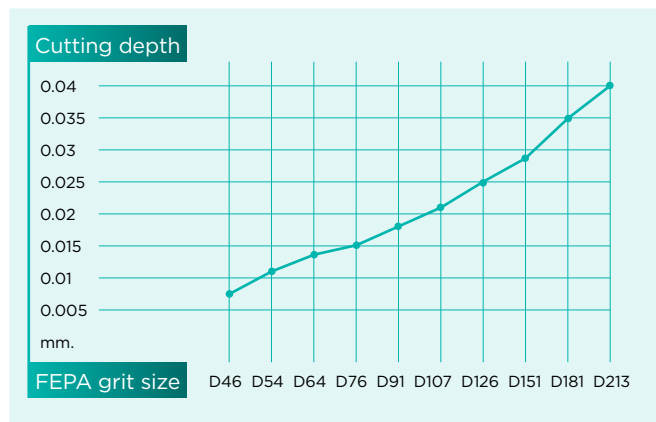
However, the generation of heat must be held within certain limits as well.

When dry grinding with a large contact area between the wheel and the work piece, the depth of cut must be much less than when grinding with a small contact area.

For creep feed grinding the grinding depth setting is not the same as the depth of cut, since the latter is limited by the speed of the table. Special metal and resin wear resistant binders have been developed for creep feed grinding. Because the contact area between the wheel and the work piece is usually large for this grinding method, proper cooling is of extreme importance.



Permissible cutting depth



Suggestions for the use of diamond wheels for grinding carbide

M: Metal binder K: Resin binder

Type of machining	FEPA wheel	Pre-grinding			Fine grinding			Lapping		
		FEPA grit	Concentration		FEPA grit	Concentration		FEPA grit	Concentration	
Hand grinding	6A2	M	D 151	100	M	D 76	50	M	D 46	40
	11A2		D 181			D 91			D 54	
			D 213			D 107		K	D 30	
Cutters, reamers, etc. an universal tooling grinding machines	11A2	M	D 151	100	M	D 76	75	K	D 30	40-50
	12A2		D 181			D 91			D 46	
	11V9		D 23			D 46	75		D 54	
		K	D 107		K	D 54				
			D 126			D 64				
Grinding profiles on profile grinding machines	1EE1	M	D 107	100-	M	D 46	75-100	K	D 30	75
	1E1Q		D 126	125		D 54			D 46	
			D 151			D 64			D 54	
			D 181			D 76				
			D 213			D 91				
Cutters planers, saws for wood-working	4A2	K	D 107		K	D 46	75-100	K	D 10	50
	6A2		D 126	100-		D 54			D 15	
	11A2		D 151	125		D 64			D 30	
	11V9		D 181			D 76				
	12A2		D 213			D 91				
	15A2									
Flat grinding, cylindrical grinding	1A1	K	D 107		K	D 46	75	K	D 7	25-50
	14A1		D 126			D 54			D 10	
			D 151	100		D 64			D 15	
			D 181			D 76			D 30	
			D 213			D 91				
Internal grinding	1A1	M	D 151		M	D 107	150	K	D 30	75-100
	1A1W		D 181						D46	
			D 213	150	K	D 126	100		D 54	
								D 64		

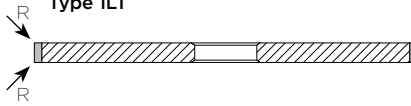
The comparison table for grit systems at the back of this leaflet shows a comparison of FEPA grits against US mesh and DIN 848.

Standard FEPA shapes and explanation of wheel symbols

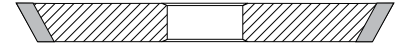
Type 1A1



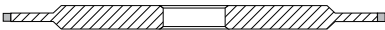
Type 1L1



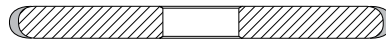
Type 1V1



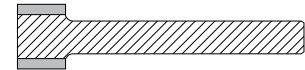
Type 14A1



Type 1FF1



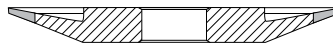
Type 1A1W



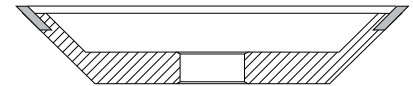
Type 14EE1



Type 4BT9/20°



Type 12V9



Type 1E6Q



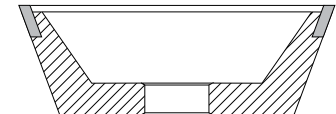
Type 14E6Q



Type 3A1



Type 11V9



Type 6A9

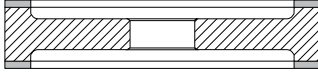


We are also able to supply shapes and sizes which differ from the FEPA standard"

Vitrified Grinding wheels

Electroplated Tools

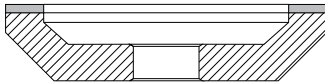
Type 9A3



We offer a full range of ceramic bond wheels including diamond & CBN. Please contact us with your requirements.

Diamond plated and CBN plated tools are produced according to customer requirements. Please send us your inquiry for review.

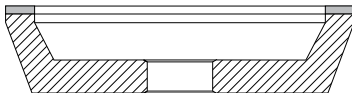
Type 12A2/45°



Type 12A2/20°



Type 11A2



Diamond dressing tools

Dressing tools used for setting and profiling grinding wheels can be supplied in various configurations. In principle, each type of diamond tool has its own application.

If the wrong choice of tools is made, problems can occur when dressing grinding wheels, particularly when a high quality surface finish is required. Custom diamond tools not shown in our catalog can be supplied upon request.

Type 6A2



For more information on standard products or custom designs, **contact us!**

Comparison table for grit systems



Advanced Diamond Products

μm	DIN 848	FEPA-Standard	US-MESH	μm
1250	D 1100	D 1182	16/18	1190
1000	D 900	D 1001	18/20	1000
800	D 700	D 851	20/25	850
630	D 550	D 711	25/30	710
500	D 450	D 601	30/35	600
400	D 350	D 501	35/40	500
315	D 280	D 426	40/45	425
250	D 220	D 356	45/50	355
200	D 180	D301	50/60	300
160	D 140	D 251	60/70	250
125	D 110	D 213	70/80	212
100	D 90	D 181	80/100	180
80	D 65	D 151	100/120	150
63	D 55	D 126	120/140	125
50	D 45	D 107	140/170	106
40	D 35	D 91	170/200	90
32	D 25	D 76	200/230	75
25		D 64	230/270	63
		D 54	270/325	53
		D 46	325/400	45
		D 35		38
		D 30		32
		D 25		25
		D 15		20
		*		10

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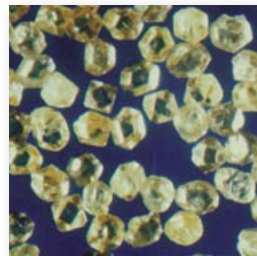
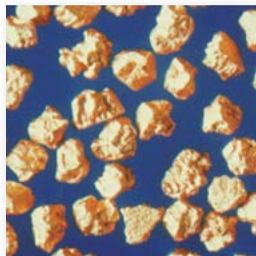
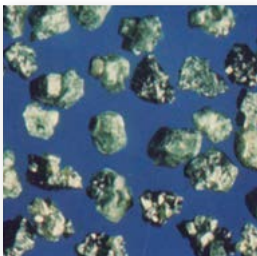
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*Wheels can also be supplied in gritsizes D3-D5-D7-D10