DIAMOND & CBN - Wheels

For High Precision Grinding Solutions

Being one of the Prime Researchers, Manufacturers and Exporters of Industrial Diamond Tools & Diamond-CBN Wheels, We **PARAS DIAMOND CO. INDUSTRIAL DIAMOND TOOLS DIVISION** offer **DIAMOND / CBN TOOLS & WHEELS for** Automotive, Flat Glass, Optical Glass, Electronics, Aero Space, Machine Tools, Bearing, General Engineering, Stone – Ceramic Processing & Diamond Processing / Manufacturing Industries World Wide. These Diamond – CBN Tools & Wheels are designed as per the Industrial norms, ensures Optimum Service life & High Performance. We also offer Diamond / CBN Wheels with customized specifications, as per request or Applications.

At **PARAS DIAMOND Co. INDUSTRIAL DIAMOND TOOL DIVISION** – We manufacture Diamond / CBN Tools & Wheels with Following Bonds:

Type of Bond	Symbol
Metallic / Metal Bond	**M**
Resinoid / Resin Bond	**R**
Electrodeposited / Electroplated Bond	**E**
Ceramic / Vitrified Bond	**V**

Type of Super Abrasives	Symbol
DIAMOND	**D**
CBN	**B**

ABOUT BOND

Resin Bond – R

Resin bond is known to be the softest of all bonds for diamond and CBN grinding tools. Their range of application is extensive. Due to their low grinding power, the soft and cool grinding, a very high material removal rate is possible. Today, more than half of all applications in the diamond and CBN-field are covered by these bonds.

Metal Bond – M

Metal bonds material removal rate is lower than resin bonded tools - with the exception of special brittle bronze combinations. The outstanding characteristic of the metal bond is the considerably long tool life. Therefore, they are especially suitable for grinding wheels with profiles, as well as for materials containing high-abrasion compounds, as i.e., Glass, Stone and Ceramic. They produce more grinding heat than resin bonds which is why they are mainly used with wet grinding.

Electroplated Bond – E

When applying the electro plated bond, a single layer of super abrasives is encapsulate by a layer of nickel onto the wheel body. The abrasive grains protrude from the coating at approx. 30 % to max.50 % of their size. Electro plated diamond and CBN tools can reach very high removal volumes. In addition, they grind at low temperatures and are very suitable for profiles and contours that are not manufacture with resin and metal bonds.

Vitrified Bond – V

The vitrified bond is a very efficient bonding system and has several considerable advantages compared to other bonds. Contrary to resin and metal bonds, the features of vitrified bonds can be optimally adapted to the individual grinding process by determining the pore size and various hardness grades. These characteristics of vitrified bonded wheels are ideal for automated grinding processes, due to their dress ability with rotating dressing tools. The porosity enables easier transport of the coolant into the contact zone, considerably faster cutting and higher removal rates.

Selection of the grit size

Material removal rate and the surface quality to be achieved depend on the size of the grinding grits. It also influences the tool life of the grinding tool. In principle, you can achieve a higher material removal rate and a longer tool life by selecting coarse grains. On the other side, finer grains do improve the surface.

Concentration

Low concentration provides more Aggressive cutting, coarser finish and potentially higher wheel wear, while high concentration provides less Aggressive cutting, finer finish and lower wheel wear.

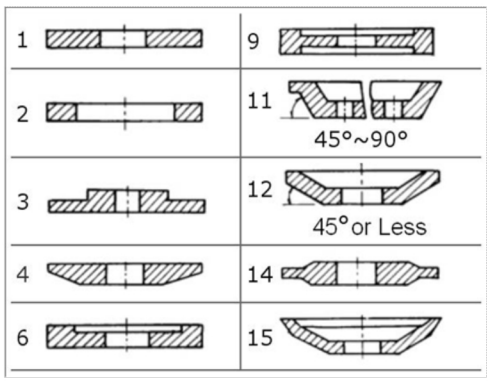
Standard grit sizes for DIAMONDS AND CBN

Diamond FEPA-Standard	CBN FEPA-Standard	Diamond + CBN mesh size	Nominal mesh size in µm
D 1181 D1182	B 1181	16-18 16-20	1000-1180
D 1001	B 1001	18-20	850-1000
D 851 D 852	B 851	20-25 20-30	710-850
D 711	B 711	25-30	600-710
D 601 D 602	B 601	30-35 30-40	500-600
D 501	B 501	35-40	425-500
D 426 D 427	B 426	40-45 40-50	355-425
D 356	B 356	45-50	300-355
D 301	B 301	50-60	250-300
D 251 D 252	B 251	60-70 60-80	212-250
D 213	B 213	70-80	180-212
D 181	B 181	80-100	150-180
D 151	B 151	100-120	125-150
D 126	B 126	120-140	106-125
D 107	B 107	140-170	90-106
D 91	B 91	170-200	75-90
D 76	B 76	200-230	63-75
D 64	B 64	230-270	53-63
D 54	B 54	270-325	45-53
D 46	B 46	325-400	38-45
Micron grit sizes			
D 35			30-40
D 30			25-35
D 25	B 30		20-30
D 20			15-25
D 15			10-20
D 10	B 15		6-12
D 7			4-8
D 3			2-4
D 1			1-2

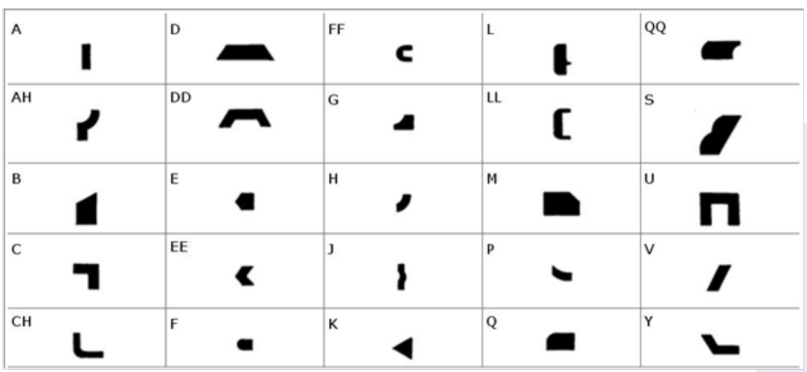
Cutting speed recommendations

Tool type	Bond	Wet grinding m/s	Dry grinding m/s
Diamond	Resin	15 - 40	10 - 20
	Metal	15 - 30	10 - 15
	Electro-plated	10 - 30	5 - 15
	Vitrified	10 - 20	
CBN	Resin	25 - 60	15 - 30
	Metal	15 - 80	10 - 15
	Electro-plated	25 - 80	10 - 25
	Vitrified	30 - 60	

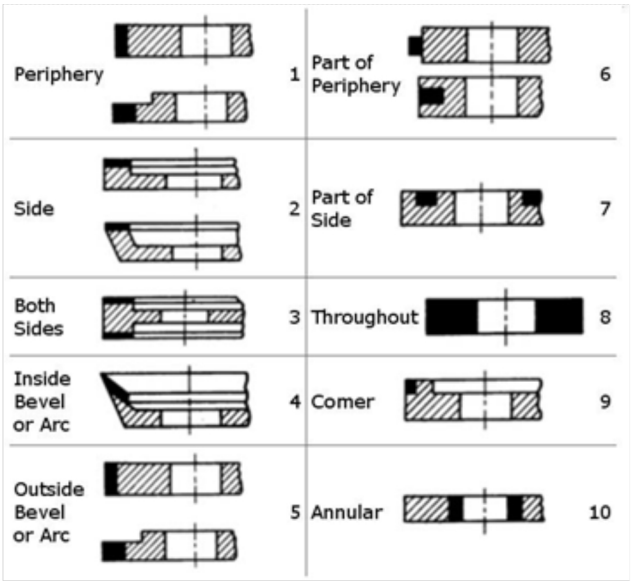
Standard Shapes of Diamond & CBN Grinding Tools – Wheels
Basic Core Shapes according to FEPA



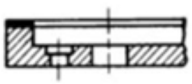
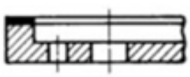
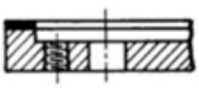
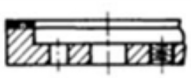
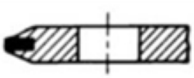
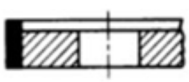
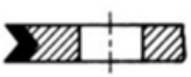
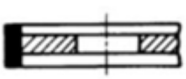
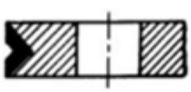
Shapes of Super Abrasive Cross Section according to FEPA



Locations of Super Abrasive Cross Sections according to FEPA



Special Modifications

Drill and Counterbore		B	Segmented Abrasive Section		S
Drill and Counterbore		C	Segmented and Slotted		SS
Plain Hole		H	Threaded Holes		T
Holes Plain and Threaded		M	Abrasive Inserted		Q
Relieved One Side		P	Abrasive Inserted		V
Relieved Two Side		R	Abrasive Inserted and Inverted		Y

SUMMARY OF DIAMOND & CBN WHEEL SHAPES
According to Standards of FEPA

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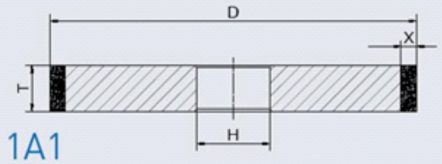

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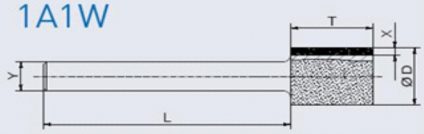

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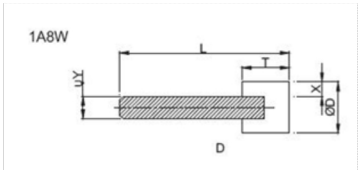

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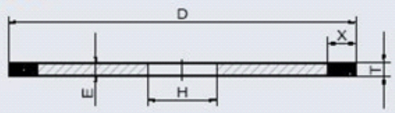

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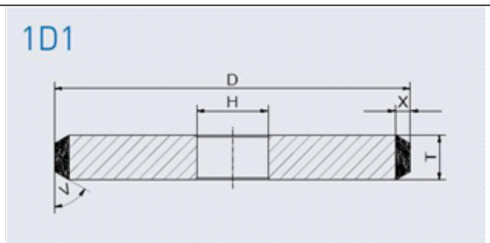

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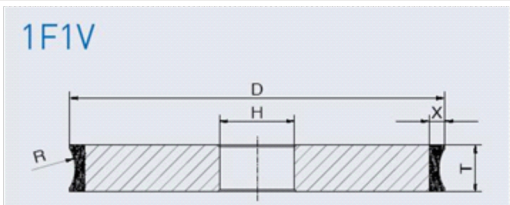

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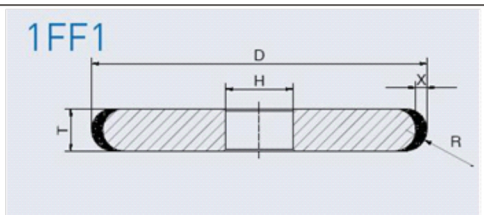

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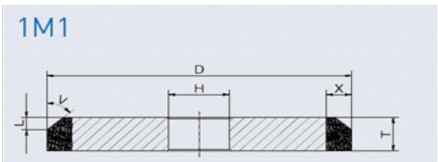

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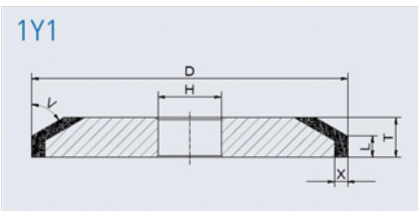

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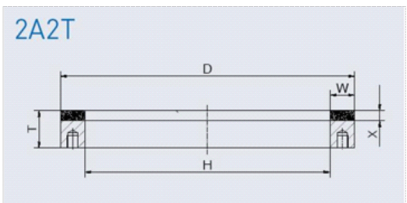

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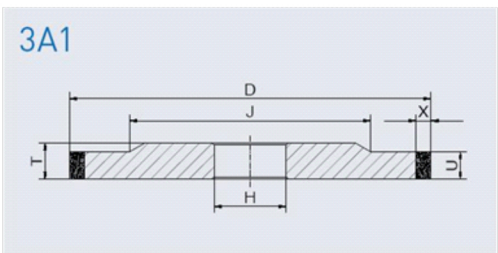

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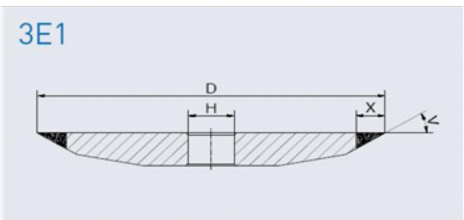

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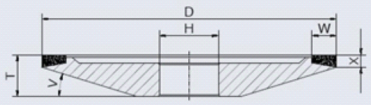

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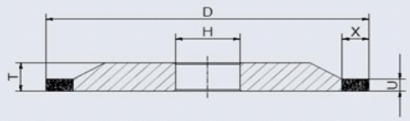

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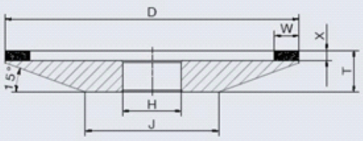

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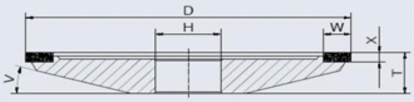

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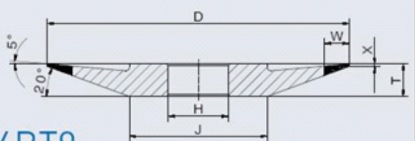

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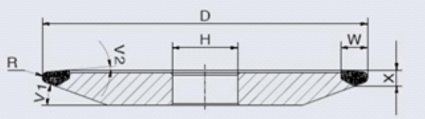

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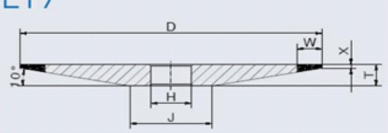

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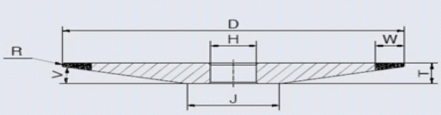

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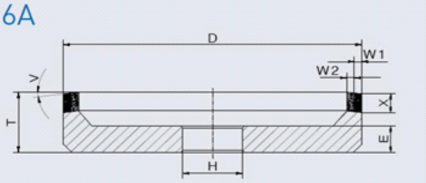

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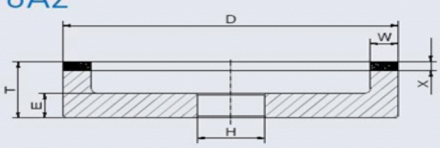

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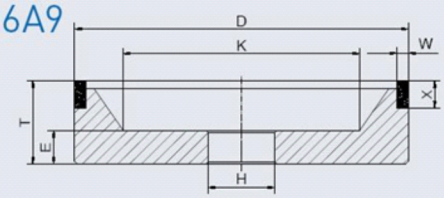

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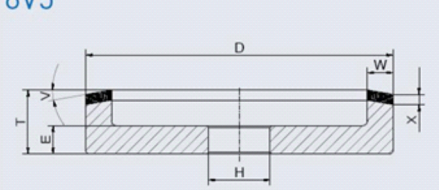

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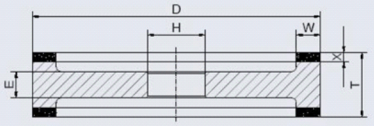

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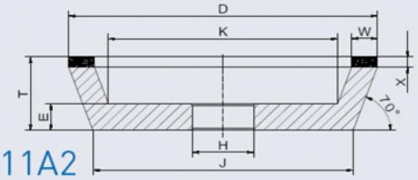

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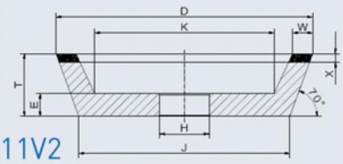

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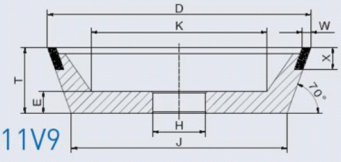

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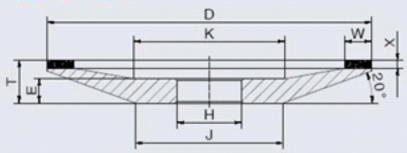

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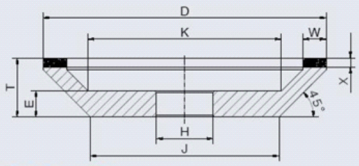

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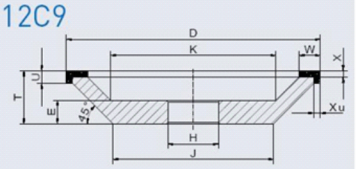

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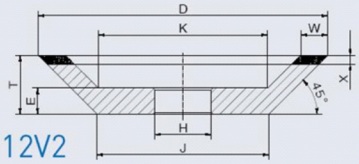

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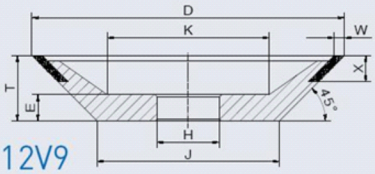

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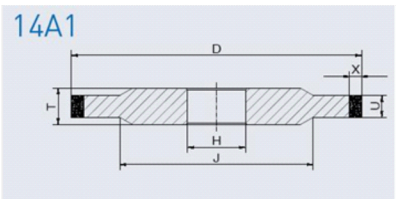

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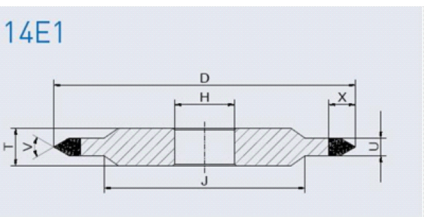

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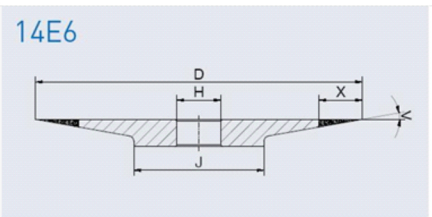

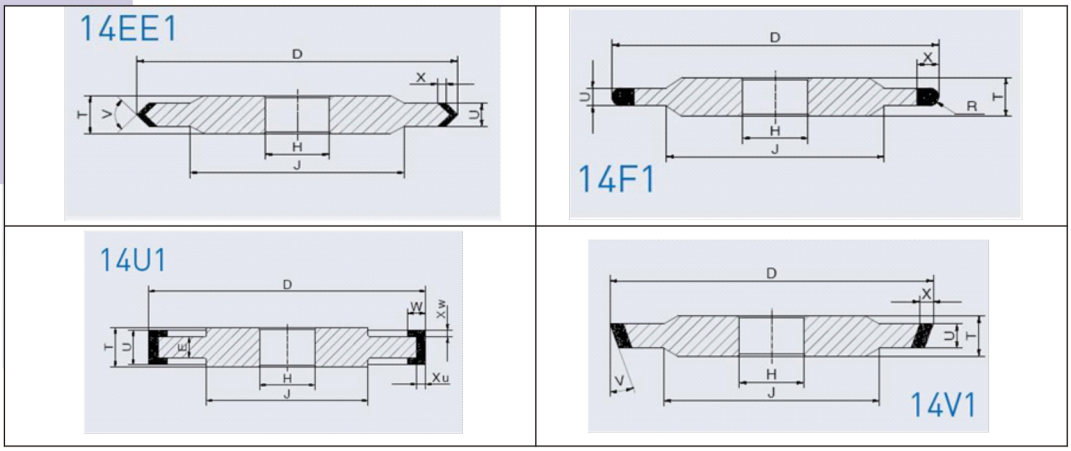

Note:

1. Other Wheels & Dimensions those depicted above can be made available against your specific request.
2. Super Abrasive Center Less, Cylindrical & Others are also manufactured on request.

Guidelines- DIAMOND & CBN Grinding Tools - Wheels

Coolant:

Should be used whenever possible. It extends wheel life by as much as 50% and keeps wheels clean and sharp.

1) Use half as much down feed when grinding dry with resin bond wheels.
2) Never use metal bond wheels dry.

Caution: Heavy cuts, especially when grinding dry, may overheat and permanently damage the diamond section of your wheel.

Dressing:

Keeps your wheel clean, sharp, and fast cutting.

1) Use aluminum oxide dressing sticks for resin bond wheels.
2) Use silicon carbide dressing sticks for metal and vitrified bond wheels.
3) Wet the dressing stick and apply it to the diamond wheel face.
4) At first, there will be back pressure as you hand feed. However, once the stick is consumed as fast as you feed

it, the wheel is conditioned and ready to use.

Truing:

Super-abrasive wheels must be trued to each machine for precision grinding.

Manually center your wheel by placing a wooden block at the point of farthest run out and gently tap wheel toward center. Choose from one of the below methods to continue:

Mild steel block method:

1) Take a piece of EN9 steel approximately 6" x 3" on a surface grinder and run the wheel at 5,000 SPFM, the table at
100 FPM using a depth of .001" per pass and a .050" - .100" cross-feed.

Friction of brake dresser method (Recommended method up to 8" diameter):

1) Use a conventional wheel to true the silicon carbide dressing wheel. Place the dressing wheel at a 15°« angle to
the super abrasive wheel.
2) Start the dressing wheel spinning by using a pencil, then down feed .001" per pass until the wheel is trued.

Power Dressing Method (perform wet, if possible):

1) Run a 120 grit silicon carbide conventional grinding wheel at 5,500 to 6,500 SFPM and the super-abrasive wheel
at 100 to 300 SFPM.
2) Pass the conventional wheel at 5 - 20 in./min/ and in-feed .001" - .003" per traverse. Continue until super-abrasive
wheel is trued.

Normal Operating Speeds:

RESIN BOND:4,000 to 6,500 SFPM
METAL BOND: 4,000 to 6,000 SFPM

While ordering, please specify the following details :

1.Type and Shape of the Wheel
2.Complete dimensions of Diameter, Grinding Width, Depth of impregnation & Bore
3.Grit Size
4.Concentration
5.Bond
6.Wet / Dry Grinding
7.Application