

# DIAMOND TOOLING FOR COMPOSITE MATERIALS

P.B.S.<sup>®</sup> DIAMOND TOOLING • PCD TOOLING • FLEXIBLE DIAMOND TOOLING



**abrasive  
technology**  
[www.abrasive-tech.com](http://www.abrasive-tech.com)





# P.B.S.<sup>®</sup> DIAMOND TOOLING

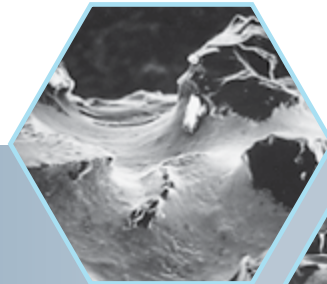
Abrasive Technology's diamond tooling is perfectly suited for composites as it provides comprehensive rough to finish solution, no matter what composite you're using. We specialize in the design and engineering of custom solutions for your unique application.

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P.B.S.<sup>®</sup> Diamond Grinding Wheel, Disc, and Saw Blade

First patented by Abrasive Technology in 1975, this original brazed bonding process chemically bonds superabrasive crystals to the substrate. This proprietary process promotes high diamond exposure with no stripping or peeling.



P.B.S.<sup>®</sup> Braze Bond Diamond particles are brazed to the substrate and cannot pull out.



Electroplated

- Diamond crystal selection, including type, shape and size, is based on specific application
- Diamond selection creates uniform diamond surface for smoother cut and better finish
- P.B.S.<sup>®</sup> braze bond creates channels for coolant and swift removal of swarf
- Machines tough-to-cut composite materials and ceramics, providing fast stock removal and deep cuts
- Offers custom-manufactured tools in special non-standard sizes and forms for tight tolerances
- Allows for stripping and recoating the core

Abrasive Technology recommends P.B.S.<sup>®</sup> tools for non-metallic materials including:

- Fiberglass • Carbon Fiber Composites
- Friction Material • FRP • Graphite
- Graphite Epoxy • Honeycomb and other composites



P.B.S.<sup>®</sup> Diamond Grinding Tools

# PCD TOOLING

PCD (polycrystalline diamond) tools are abrasion resistant with the capacity to out-produce carbide tooling up to 100 times. Our diamond technology allows for custom designed flute, rake, and tip geometries.

## Increased Tool Life

- Reduced cost per inch machined
- Random orientation of the diamond crystals means uniform hardness and abrasion resistance in all directions
- Controlled PCD manufacturing process provides consistent physical properties from part to part

## Improved Machining Characteristics

- Excellent diameter tolerance control
- Reduced coefficient of friction versus tungsten carbide which minimizes heat buildup at the cutting edges
- Minimizes fiber tear-out and delamination
- Does not bond with work piece materials so edge build-up is minimal for improved surface finish

## Reduced Cycle Time

- Cycle time reduced due to the thermal conductivity and heat resistance of PCD

## Resharpenable

- Continued use of tool for multiple cycles after initial purchase
- Resharps/regrinds at reduced cost compared to new

Abrasive Technology recommends PCD tooling for the following materials:

- CFRP • CFRP/AL stacks • MMC
- Phenolic • Hard Rubber • FRP
- Aluminum alloys • Brass and Bronze alloys
- Zinc alloys • Magnesium alloys



## High Performance PCD Tipped Inserts

For rough and finish machining of non-ferrous and non-metallic parts

- Longer PCD edge lengths allow larger depths of cut, reducing the number of passes - resulting in shorter cycle time and increased productivity
- Large PCD sections provide more holding power - resulting in more re-laps and fewer tip pull offs
- Polished PCD tops for keener edges and better chip flow
- Can be used to machine aluminum in both neutral and negative holders
- Edges ground on CNC equipment for consistency and quality finishes
- All inserts are manufactured to the latest ISO standard for assured quality



## PCD Wear Parts

The life of PCD components is typically 100 times that of the carbide or HSS predecessor. The low friction coefficient of PCD, together with its ultra hardness, ensures that high levels of component accuracy are maintained over the component's life span.

### PCD wear surfaces are used for:

- Vee Supports
- Backing Plates
- Gauging Fingers
- Gauging Points
- Back Stops
- Face Grinding
- PCD Rings

### Advantages:

- Reduced whole life costs
- Reduced downtime
- Reduced changeover rates
- Increased component accuracy

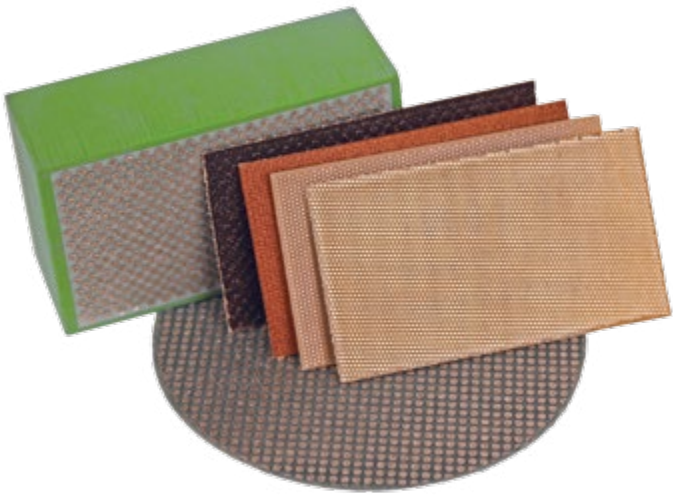


## PCD Combination Tooling

Designed to meet our customers' specific applications. For machining non-ferrous materials, including high silica aluminum and other exotic materials.

- Combines several tool operations in one pass
- Diamond cutting edge = high precision
- Long life = reduced downtime
- Reduced number of machining stations
- Reduced tooling stock holding
- Tamperproof tooling
- High component consistency

# FLEXIBLE DIAMOND TOOLING



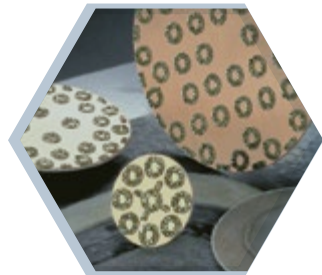
Flexible Diamond Discs and Pads

Our flexible diamond products are designed for contouring and shaping, as well as feathering honeycomb material or making delicate adjustments to a formed surface. There is little heat build-up and very little pressure is required. The cool, rapid, even cutting eliminates surface distortion, increases productivity and reduces costs.



### Genesis™ Diamond Discs, Belts and Orbital Pads

Designed to grind, hone and polish composite surfaces to a smooth finish



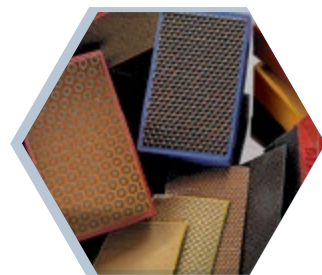
### Tech-Lok™ Diamond Discs

Ideal for scarfing, shaping, deburring, feathering and finishing nearly all composite materials



### Baby-Rok™ Diamond Discs

Ideal for removing deep scratches in composites left during the cutting process



### Diamond Handpads

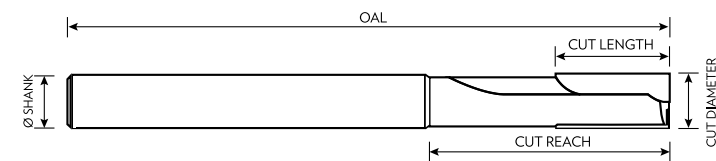
Excel at abrading composites, ceramics, glass, plastics and stone. Available in firm or flexible bases, their ideal hand size allows the finishing of surface shapes and areas that are hard to reach with power tools

# PCD ROUTERS FOR EDGE AND APERTURE MACHINING OF CARBON FIBER

Cutter design, geometry, PCD grade, and shank material have all been carefully selected to maximize productivity and tool life, while minimizing downtime, delamination and overall machining costs.

### Advantages:

- Better surface finish and higher component accuracy
- Less heat generated, resulting in reduced uncut fibers and layer delamination
- Ability to rough and finish with the same tool
- Higher working parameters on machines



## RANGE OF ROUTING TOOLS

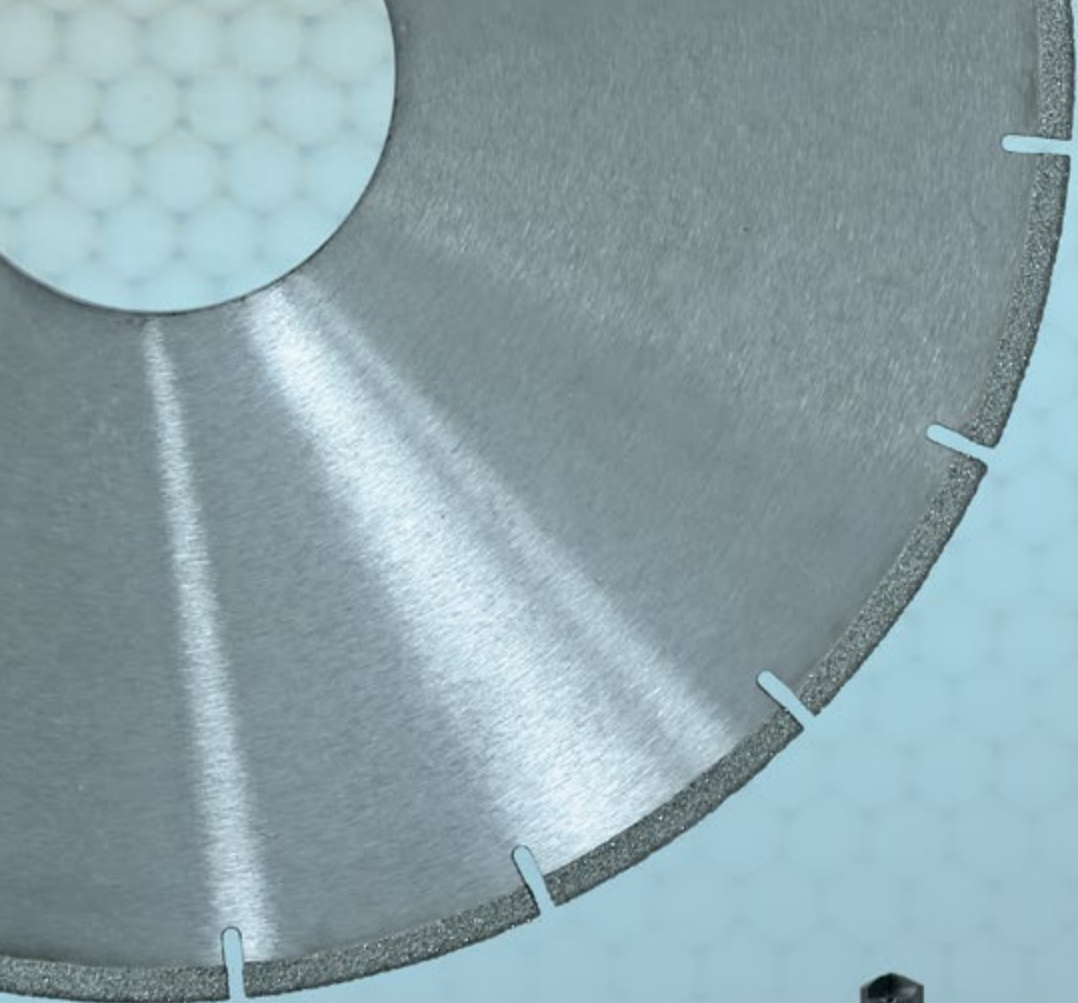
DIA.	SHANK MATERIAL	# FLUTES	LENGTH OF CUT	CUT REACH	SHANK DIA. (Inch)	OVERALL LENGTH	CENTER CUTTING (Opt)	THROUGH COOLANT (Opt)	SHEAR ANGLE 5° (Opt)
1/4"	WC	2	0.375"	0.875"	Ø8.00MM	2.375"	Y	Y	N
6MM	WC	2	10MM	22MM	Ø8.00MM	60MM	Y	Y	N
5/16"	WC	2	0.5"	1.25"	Ø8.00MM	3.125"	Y	Y	N
8MM	WC	2	13MM	32MM	Ø8.00MM	80MM	Y	Y	N
3/8"	WC	2	0.5"	1.25"	Ø10MM	3.125"	Y	Y	N
10MM	WC	2	13MM	32MM	Ø10MM	80MM	Y	Y	N
1/2"	WC	2	0.750"	1.5"	Ø12MM	4.0"	Y	Y	Y
12MM	WC	2	20MM	40MM	Ø12MM	100MM	Y	Y	Y
1/2"	WC	3	0.750"	1.5"	Ø12MM	4.0"	N	N	Y
12MM	WC	3	20MM	40MM	Ø12MM	100MM	N	N	Y
5/8"	STEEL	4	0.750"	1.5"	0.625"	4.0"	N	Y	Y
16MM	STEEL	4	20MM	40MM	Ø16MM	100MM	N	Y	Y
3/4"	STEEL	4	1.0"	1.5"	0.75"	4.0"	N	Y	Y
20MM	STEEL	4	25MM	40MM	Ø20MM	100MM	N	Y	Y
1"	STEEL	6	1.0"	3.0"	1.0"	5.0"	N	Y	Y
25MM	STEEL	6	25MM	75MM	Ø25MM	130MM	N	Y	Y

\*Router tooling customizable with variety of options. Please contact us for more information.

### ROUTER OPTIONS

- Standard Ramp & Rout
- Center Cut
- Through Flushing
- Shear Angle 5°





WORLD HEADQUARTERS  
United States  
P: 1.740 548.4100  
F: 1.740 548.7617

EUROPEAN HEADQUARTERS  
United Kingdom  
P: 44.20.7471.0200  
F: 44.20.7471.0202

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