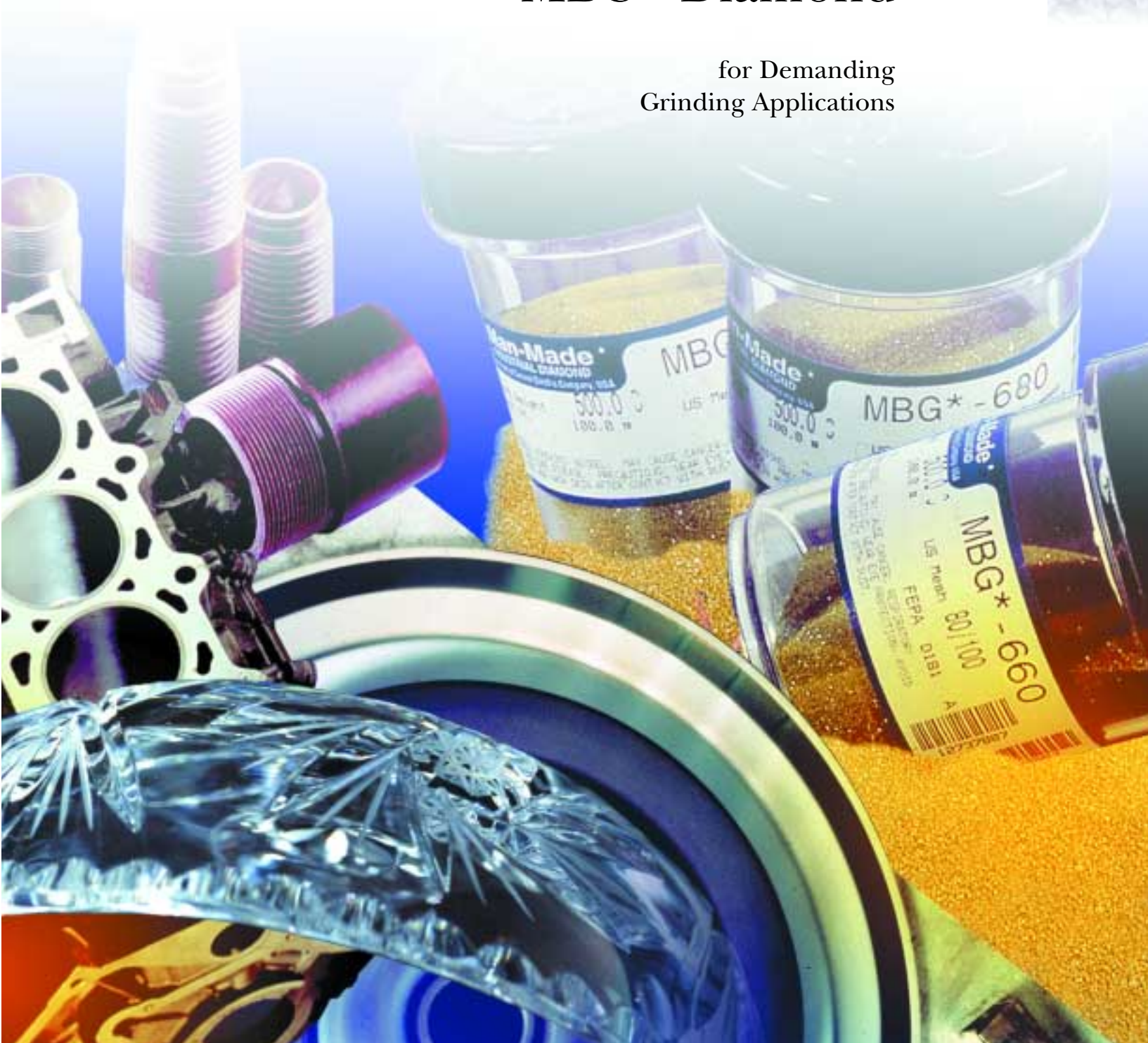




MBG* Diamond

for Demanding
Grinding Applications



MBG* Diamond for Demanding Grinding Applications

Tightly Controlled Crystal Properties- Tailor Made for Your Application

MBG diamond grinding products offer the most tightly controlled properties and characteristics of any grinding diamond in today's market. From the most well-defined crystals to highly friable irregular shapes, the MBG product line offers tailor made diamonds for a wide range of grinding applications in non-ferrous materials.

The MBG product range is a result of continuous diamond engineering, to deliver extraordinary grinding results in a competitive market environment. Diamond Innovations uses advanced Six Sigma controlled engineering methods to manufacture the hardest, toughest, most abrasion resistant and thermally stable grinding diamonds.

Special Product Innovation for the Electronics Industry

MBE – Metal Bond Electronics grade diamond is specially engineered for the needs of the electronics industry. Extremely tightly controlled product characteristics are the key to success for applications where absolute precision is a must. Six different diamond grades ensure that the new MBE product meets the high technology demands of this important industry. MBE products can also be customized for your particular application.

Optimum Performance in All Bond Systems

MBG diamond is designed to achieve optimum performance in all bond systems: from resin and metal, to vitreous or electroplated systems. Due to its ability to achieve considerably higher material removal rates as well as excellent surface finishes, MBG diamond is highly cost effective. Significant increases in productivity and work piece quality can be achieved, if MBG diamond products are utilized following our recommended application guidelines on the back page of this brochure.

Crystal Coatings and Surface Treatment

A variety of high-tech coatings provide for superior crystal retention characteristics in all bond systems. The success results from the combination of first grade diamond crystals and a superior coating technology. T-Treatment is a special surface treatment that eliminates nodule build up in the plating process and enhances bath life.

Benefits of MBG Diamond Grinding

- Increased parts per hour / cycle time reduction
- Reduced scrap rate
- Less tool changes
- Reduced machine maintenance / higher machine uptime
- Labor cost saving
- Increased production capacity without capital investment
- Enhanced overall productivity

The Most Comprehensive Coating Series for Grinding Diamonds

Diamond Innovations continues to be recognized as the premier coating expert for industrial diamond grinding products. Coatings protect the diamond crystal from aggressive bonding substances and reduce the instance of crystal pull-outs.

Coated MBG diamond will deliver unmatched free cutting properties, reduced diamond pull-outs and maximum utilization of every grinding crystal in the bond matrix.

End users benefit from better grinding consistency and longer tool life. Coated MBG diamonds also reduce power consumption through enabling superior free cutting capabilities.

Benefits for the Toolmaker

- Improved bond flexibility and easier sintering control
- Superior bond retention by alloying with the bond matrix
- Powerful adhesion to diamond surface through strong carbide forming
- Excellent heat transfer
- Improved lubrication qualities
- Attractive price to performance ratio

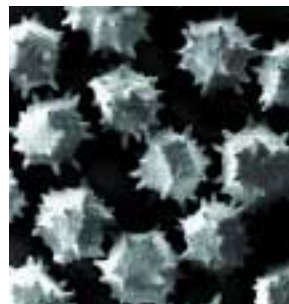
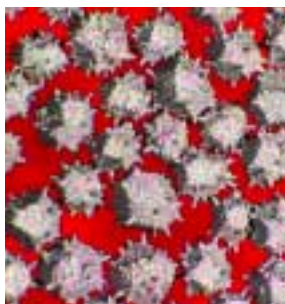
Benefits for the End User

- Higher grinding parameters
- Improved tool and grinding consistency
- Improved material removal rates
- Finer surface qualities
- Lower power consumption
- Longer tool life
- Cost optimization of the process

SB – Soft Bond Coating Advanced Super-Spiked Coating for Free Cutting Soft Bond Matrixes

Special coating for soft metal bonds containing a high percentage of copper or copper alloys.

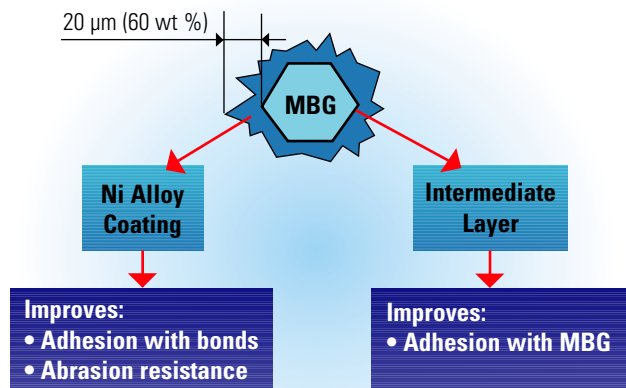
Outstanding bond retention through super-spiked coating surface. Protects diamond effectively from bond erosion.



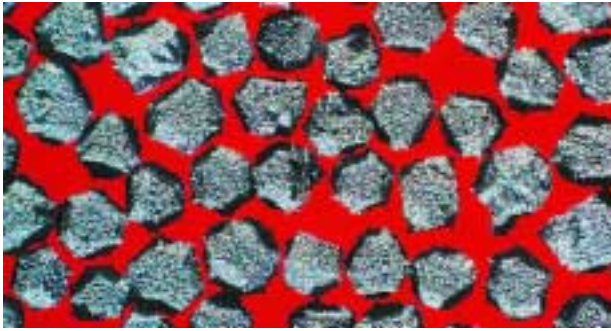
New Super-Spiked MBG SB diamond for soft bond matrixes
Coating level: 60 wt %

Innovative Double Coating Design of MBG SB

Intermediate layer plus super-spikes enhance crystal retention.



Nickel Based Alloy Coating



Recommended for use in phenolic resin bond systems to improve the mechanical retention of the diamond in the bond matrix. Improves grinding wheel life and surface finish.

Available in MBG 300, 610 and 620.

Titanium Based Alloy Coating

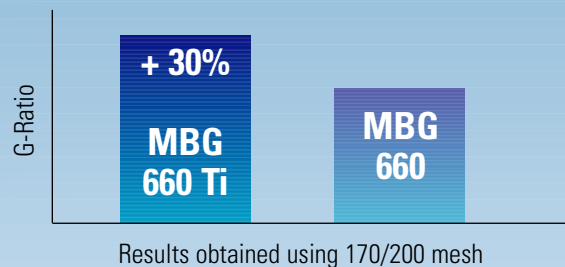


Generally suitable for cobalt bonds containing iron, steel and/or bronze. Provides enhanced diamond retention through chemical bonding and suppression of diamond degradation in the processing of bronze and cobalt bond systems.

Available in MBG 680, 620, 640 and 660.



MBG 660Ti vs. MBG 660 in automotive glass pencil edging operation



T-Treatment

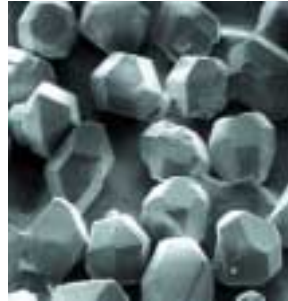
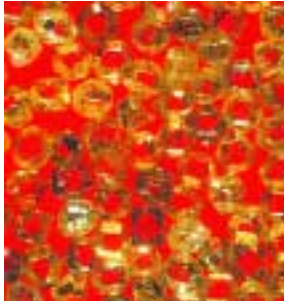
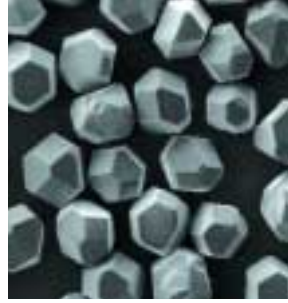
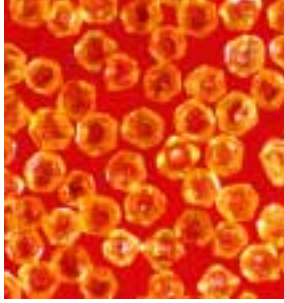
Chemical diamond cleaning process designed to ensure the highest performance in electroplating operations. T-Treatment eliminates nodule build up in the plating process and enhances bath life.

General Bond Recommendations for Superior Performance of MBG Coated Diamonds

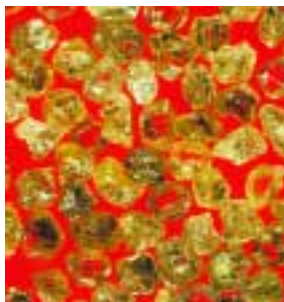
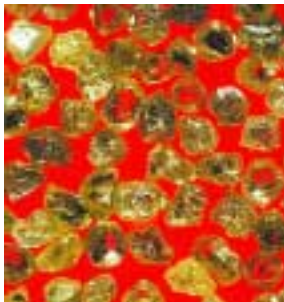
The use of coated MBG diamond products requires an evaluation of the compatibility with the bond system and manufacturing conditions.

Coating	Bond	Typical Applications
Ti – Titanium based	Cobalt, Iron and Bronze	pencil edging, glass, ferrites, honing, back grinding of Si wafers
Ni – Nickel based	Resin and Bronze	grinding of carbide and steel, ceramic cutting tools and honing tools
SB – Super Spiked	Resin and Bronze	cut off application of carbides, ceramics, stone and glass grinding

High Toughness



Medium Toughness and Friability



MBG 680 Diamond

Our best standard grade MBG product with cubo-octahedral shaped crystals. MBG 680 has outstanding toughness and thermal stability, which allows for superior performance in the most demanding and precise applications. MBG 680 achieves new productivity highs in: electronics applications and pencil edging of automotive glass.

MBG 660 Diamond

Well defined cubo-octahedral crystals with lowest eccentricity. Minimized internal impurities and lattice strain guarantee superior thermal impact and shock resistance, as well as high bulk fracture and shear strength. Excellent performance in applications with severe grinding forces and high material removal rates. Outstanding impact strength. Recommended for: Ferrite motor core grinding, tungsten carbide button grinding, high performance pencil edging.

MBG 640 Diamond

Premium diamond, thermally tough, low eccentricity, cubo-octahedral crystal shape with high impact and fracture strength. Tight distribution of crystal shapes and strength enhances extended tool life, uniform wear and excellent free cutting capability. High material removal rates achieved in: Core drilling of glass, decorative grooving of crystal or glass, OD grinding of Si_3N_4 wear parts, PD grinding of crystal.

MBG 620 Diamond

Both well formed crystal facets and regions of increased surface toughness yield good bulk strength plus enhanced thermal stability. Provides an ideal balance between tool life and surface finish requirements. Ideal for applications where free cutting tools are a must. Minimizes work piece burn and edge chipping in brittle materials. Highly recommended for: Flat glass beveling, edge grinding, pencil edging and seaming, cut-off wheels for crystal and glass.

MBG 610 Diamond

Crystal facets show a higher degree of surface roughness than MBG 620. Increased friability and sharp cutting edges make this product most suitable for metal bond systems. Excellent results in: Low force grinding of glass, quartz and carbide, less severe pencil edging, semi-finishing of flat glass, beveling of furniture glass and mirrors, cut-off wheels for glass and quartz, ferrite grinding.

MBE* – Metal Bond Electronics Grade Diamond



Precision is key in electronics applications. Recognizing the need for even tighter controlled diamond characteristics, Diamond Innovations introduces MBE, a special diamond for electronics applications. MBE is produced in a single, continuous manufacturing process, using the highest quality Man Made* diamond and utilizing state-of-the-art diamond characterization technology for unprecedented consistency and uniformity.

Six grades of MBE diamond can be customized for any particular requirements. MBE grades are derived from the following MBG base crystals:

MBE Grade	MBG Crystals Used
MBE 1000	MBG 680
MBE 900	MBG 660
MBE 800	MBG 640
MBE 700	MBG 620
MBE 600	MBG 610
MBE 500	MBG 600

Narrow sizing

Sizes available: 60 - 170 mesh / 90 - 271 micron

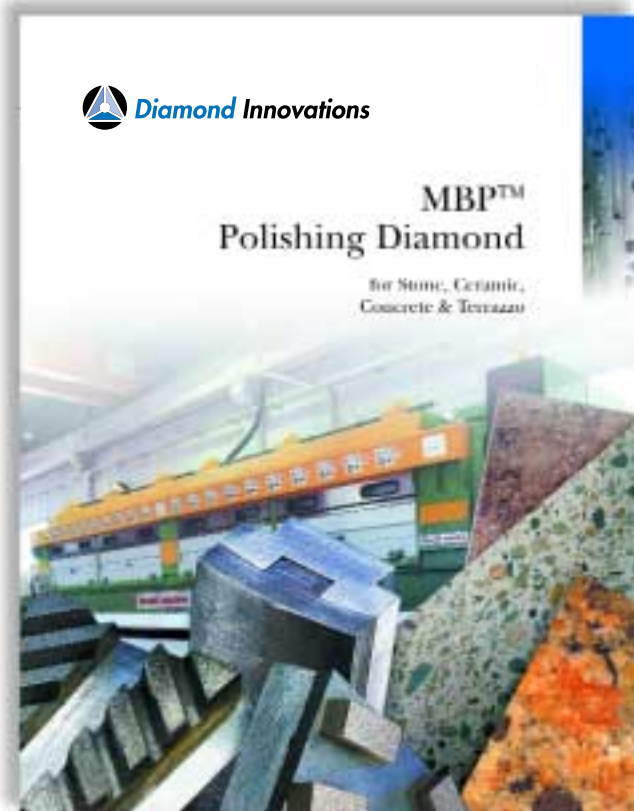
Tight sizing available with breaks on the following micron sizes: 90, 107, 116, 127, 139, 151, 165, 181, 197, 213, 227, 255, 271

Tight Control from Start to Finish

- Made from quality MBG diamond
- Controlled for shape using proprietary technology
- Controlled for toughness
- Very limited inclusions or "twin" crystals

Custom Specifications Available

- Toughness and/or shape specifications
- Size specification
- Magnetic susceptibility specifications
- Narrow sizing (see availability chart)
- T-Treatment for electroplating



MBP* Polishing Diamond for Stone, Ceramic, Concrete & Terrazzo

The MBP product line was created to meet the needs of toolmakers manufacturing polishing tools for applications in stone, ceramic, concrete and terrazzo.

A tailored range of innovatively designed diamond, from maximum impact strength, to high fracture strength to friable, free cutting, irregularly shaped diamonds.

All MBP products are also offered with titanium based coating. Ask your sales representative for this brochure.

General MBG Diamond Application Guidelines

MBG 680	MBG 660	MBG 640	MBG 620	MBG 610	MBG 600	MBG 300
Very high impact High MRR appl. Rigid machine	Very high impact High MRR appl. Rigid machine	High impact Power restricted machine	Medium impact High contact areas Long arc lengths	Appl. requiring low forces per crystal	Electroplated appl. requiring sharpness	Low impact High contact areas
Glass Auto. pencil edging	Glass Auto. pencil edging Fluting crystal stems Ferrite Grinding motor cores	Glass Auto. pencil edging Auto. seaming Engraving crystal Cut-off wheels Ferrite Grinding motor cores	Glass Pencil edging Beveling flat glass & mirrors Tungsten carbide Burr grinding Carbide & steel cutting tools Cast iron Honing cylinder liners Fiber glass & composites Backgrinding of silicon wafers	Glass Auto. seaming Mirror edging Bevel polishing	Glass Mirror edging Bevel polishing Ceramic comp. Dental burrs	Gems Sciafing Ceramic tiles Finish polishing

MBG Diamond Mesh Size Availability

	60/80	60/70	70/80	80/100	100/120	120/140	140/170	170/200	200/230	230/370	270/325	325/400	400/500	500/600	600/700
300	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
600	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
610	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓		
620	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
640	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	S	S	S
660	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
680	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

✓ Available S Special – please refer to your sales representative

Coatings and Treatments Availability

	T	Ni	Ti	SB
300	✓	✓		
600	✓			
610	✓	✓		
620	✓	✓	✓	✓
640	✓		✓	✓
660	✓		✓	✓
680	✓		✓	

Convenient online ordering through
www.AbrasivesNet.com

Order Specifications:

State name of product and ad suffix of treatment or coating process.

Order example: MBG 660 (T), MBG 660 Ti 170/200

* Trademark of Diamond Innovations, USA
© Copyright 2004 Diamond Innovations, USA



Diamond Innovations
6325 Huntley Road, Worthington, OH 43085, USA
Phone: (1) 614 438 2000, Fax: (1) 614 438 2888
Toll free: 1 800 443 1955

www.AbrasivesNet.com

DI 1337 E