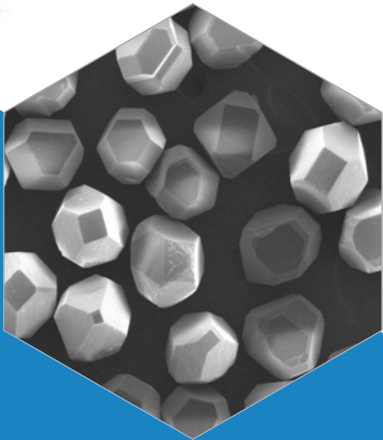


TOOLMAKER SOLUTIONS
MBG[®] Diamond



Diamond abrasives offering
customized and tailored
solutions for demanding
applications

MBG[®] DIAMOND FOR DEMANDING GRINDING APPLICATIONS

Hyperion's MBG diamond offers a solution for grinding demanding materials such as glass, stone and electronic materials. The shapes range from well-defined crystals to highly friable, irregular shapes that can be customized for any application.

TIGHTLY CONTROLLED CRYSTAL PROPERTIES CUSTOMIZED 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 diamond product line offers customized diamonds for a wide range of grinding applications in non-ferrous materials.

The MBG diamond product range is a result of continuous diamond engineering, to deliver extraordinary grinding results in a competitive market environment. Hyperion 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

Metal Bond Electronics (MBE[®]) 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 MBE diamond grades ensure that the new MBE diamond product meets the high technology demands of this important industry. MBE diamonds products can also be customized for your particular application.

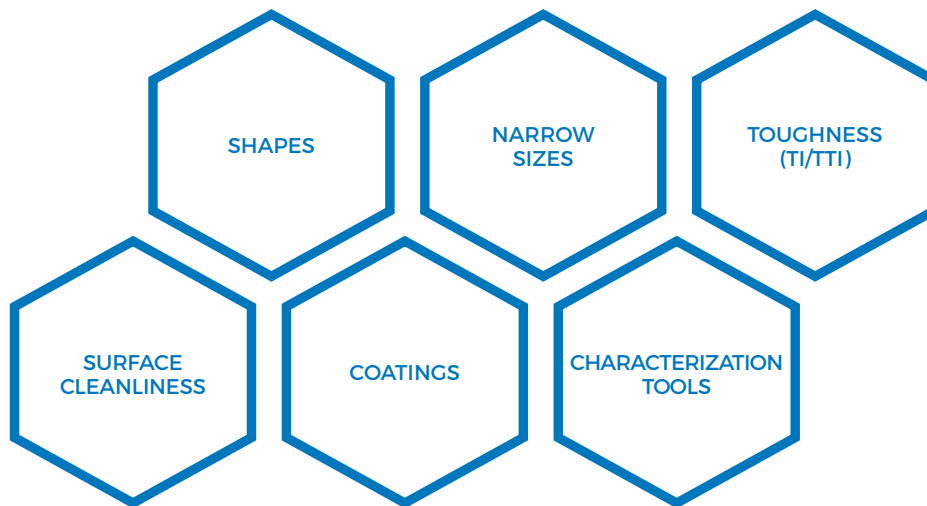
OPTIMUM PERFORMANCE IN ALL BOND SYSTEMS

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 (MRR) 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 found on the last page of this brochure.

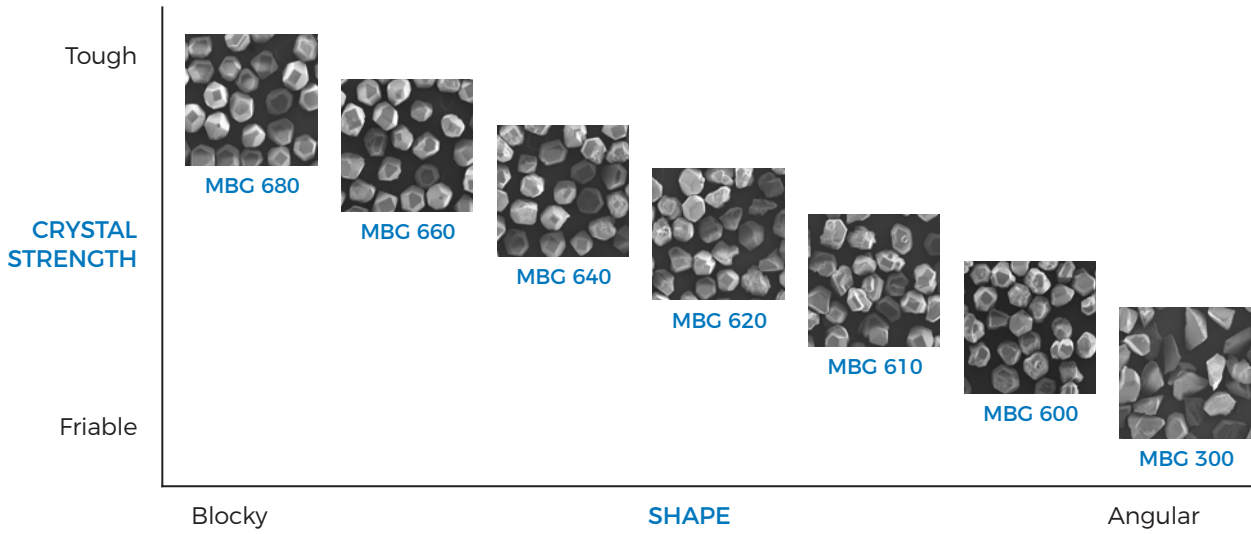
CRYSTAL COATINGS AND SURFACE TREATMENT

A variety of high-tech coatings provide 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.

CUSTOMIZATION CAPABILITIES



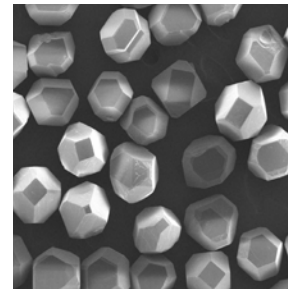
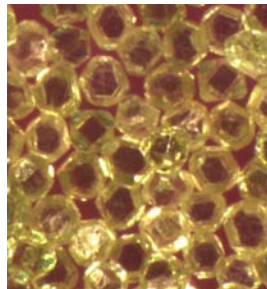
MBG® DIAMOND



MBG 680 Diamond

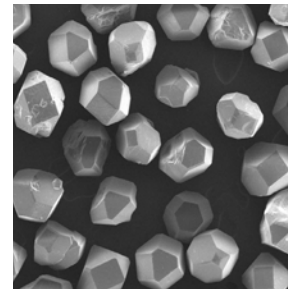
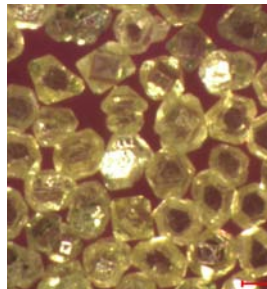
Our best standard grade MBG diamond with cubo-octahedral shaped crystals. MBG 680 diamond has outstanding toughness and thermal stability, which allows for superior performance in the most demanding and precise applications. MBG 680 diamond achieves new productivity highs in electronics applications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

HIGH TOUGHNESS



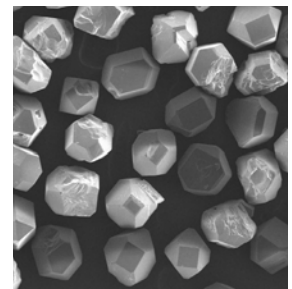
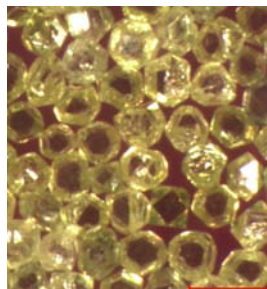
MBG 660 Diamond

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 and 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 and PD grinding of crystal.



MBG[®] DIAMOND

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 and cut-off wheels for crystal and glass.

MBG 610 Diamond

Crystal facets show a degree of surface roughness higher than that of MBG 620 diamond. 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 and ferrite grinding.

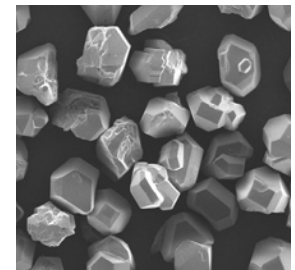
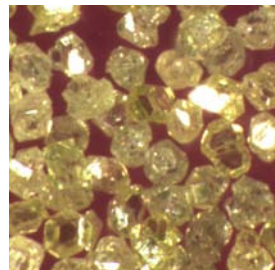
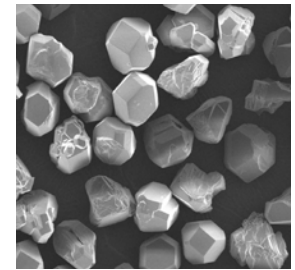
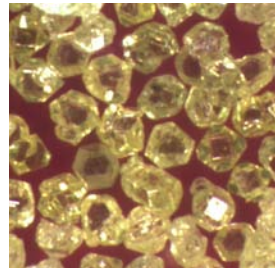
MBG 600 Diamond

Sharp, angular diamond crystals with excellent friability. Enhanced surface roughness guarantees excellent bond retention. Impact crystal strength and eccentricity values range between those of MBG 610 and MBG 300 diamonds. Ideally suited for electroplated tool applications such as fired tungsten carbide grinding, metal bond honing of chlorine cylinders and dental burrs.

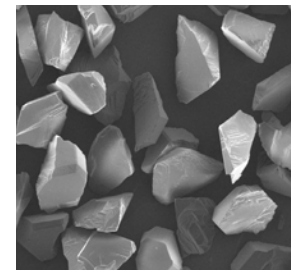
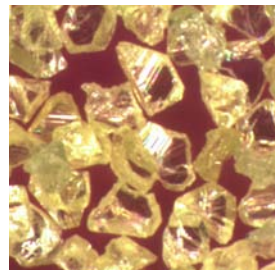
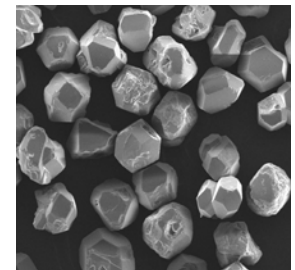
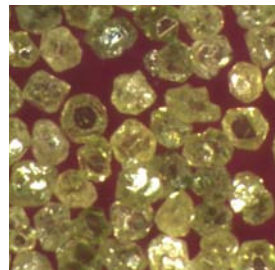
MBG 300 Diamond

The most friable and angular shaped diamond in the MBG series. Designed for low dynamic load applications requiring fast regeneration of sharp cutting edges. Effective use in both metal and resin bond systems. Highly recommended for low impact/ high contact area processing such as rubber cut-off wheels, resin bond stone polishing tools, solid polycrystalline cubic boron nitride (PCBN) grinding and gemstone scaifing.

MEDIUM TOUGHNESS AND FRIABILITY

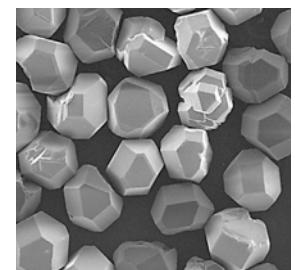
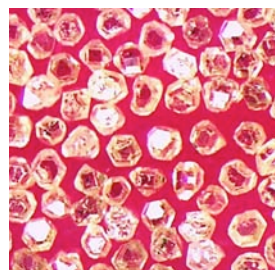


HIGH FRIABILITY



MBE - METAL BOND ELECTRONICS GRADE DIAMOND

Precision is key in electronics applications. Recognizing the need for even tighter controlled diamond characteristics, Hyperion 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.



THE MOST COMPREHENSIVE COATING SERIES FOR GRINDING DIAMONDS

Hyperion 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.

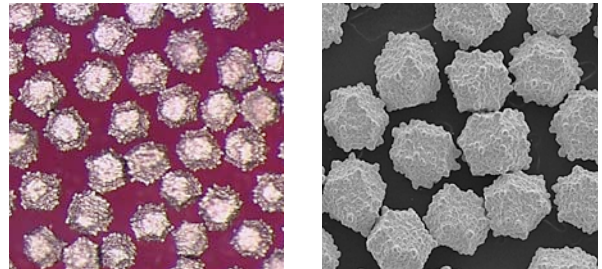
Coated MBG diamond will deliver unmatched free cutting properties, reduced diamond pull-outs and maximum utilization of every grinding crystal in the bond matrix.

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

SOFT BOND (SB) 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 %

BENEFITS FOR THE TOOLMAKER

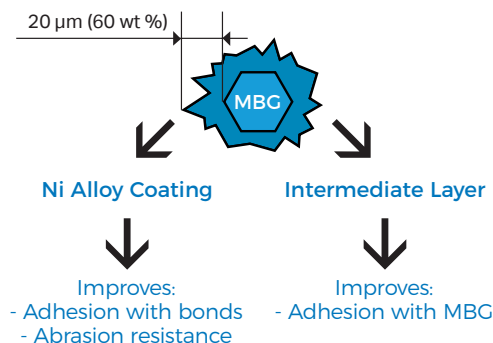
- Improved bond flexibility and easier sintering control
- Superior bond retention by alloying with the bond matrix
- Powerful adhesion to diamond surface through strong carbide forming
- Excellent heat transfer
- Improved lubrication qualities
- Attractive price to performance ratios.

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.

INNOVATIVE DOUBLE COATING DESIGN OF MBG SB DIAMOND

Intermediate layer plus super-spikes enhance crystal retention.

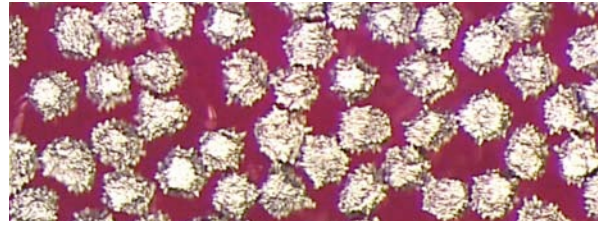


MBG® DIAMOND

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.

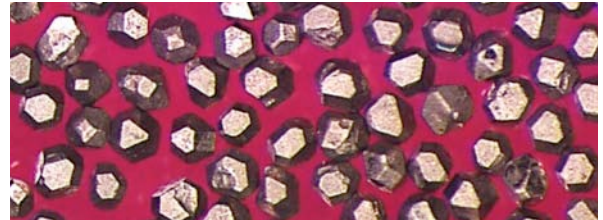
Available in MBG 300, 610 and 620.



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.

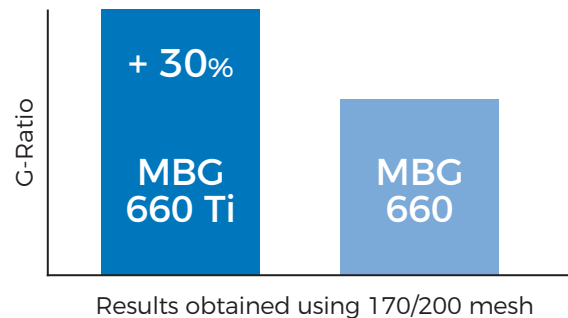
Available in MBG 680, 620, 640 and 660.



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.

MBG 660 TI VS MBG 660 IN AUTOMOTIVE GLASS PENCIL EDGING OPERATION



GENERAL BOND RECOMMENDATIONS FOR SUPERIOR PERFORMANCE OF COATED MBG DIAMONDS

The use of coated MBG diamonds requires 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 and 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	Cutoff application of carbides, ceramics, stone and glass grinding

MBG® DIAMOND

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	Glass	Glass	Glass	Glass	Glass	Gems
Auto. pencil edging	Auto. pencil edging. Fluting crystal stems.	Auto. pencil edging. Auto. seaming. Engraving crystal. Cut-off wheels.	Pencil edging. Beveling flat glass & mirrors.	Auto. seaming. Mirror edging. Bevel polishing.	Mirror edging. Bevel polishing.	Scaifing.
	Ferrite	Ferrite	Tungsten carbide		Ceramic comp.	Ceramic tiles
	Grinding motor cores	Grinding motor cores	Burr grinding. Carbide & steel cutting tools.		Dental burrs	Finish polishing
			Cast iron			
			Honing cylinder liners			
			Fiber glass & composites			
			Backgrinding of silicon wafers			

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	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	•	•	•
660	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			
680	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓				

✓ Available • Special [please refer to your sales representative]

COATINGS AND TREATMENTS AVAILABILITY

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

✓ Available

ORDER SPECIFICATIONS

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

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

