Gem Diamond Products

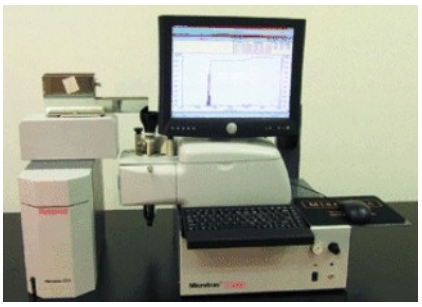
Diamond Powder and CBN

Advances in engineering technologies along with requirements of tougher materials for component manufacturing has given rise to a situation where conventional toolings are no longer effective. Since the past couple of decades, diamond and cBN have emerged as the preferred abrasive for a range of industries due to their considerable hardness, toughness and versatility in terms of materials that may be processed with their use.

At Gem Diamond Products, we are committed to providing the industry with the complete range of diamond and cBN powders including the tough Metal Bond Synthetic Diamond Powder for grinding and sawing applications, the friable Resin Bond Synthetic Diamond Powder for quick cutting on engineering materials, Natural Diamond Powder for certain applications where Synthetic Powders are not suitable, Graded Synthetic Diamond Micron Powder for exceptional surface finish and smoothness, and Cubic Boron Nitride for applications involving ferrous materials.

Our superabrasives powder division is dedicated to providing the best diamond powder available worldwide. Beginning with sourcing of the best grade diamonds available worldwide, the powders are subject to a thorough cleaning and purification process to remove even the last traces of impurities. The powders are then graded using state-of-the-art machinery and then subjected to rigorous quality control procedures using sophisticated equipment such as the Leeds and Northrup Microtrac Laser Particle Size Analyzer and computerized Image Analysis techniques to ensure they are of the highest standard.

Stereo Microscope

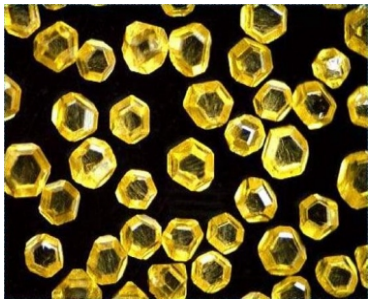


Leeds & Northrup Microtrac Laser Particle Size Analyzer

Image Analysis Equipment

All of our diamond powders are certified and in accordance with the International FEPA Regulations in terms of purity, grading and quality. A wide range of choice in each type of Diamond Powder ensures that there is a type of abrasive available for every individual requirement of production, life and finish.

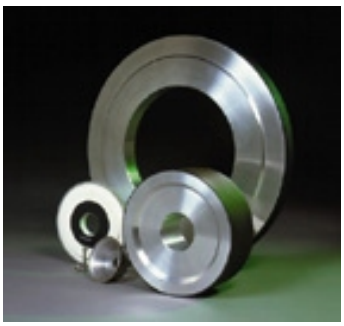
Metal Bond Synthetic Diamond Powder



Metal Bond Synthetic Diamond Powder is widely used for various applications in the stone and engineering industry. The toughest diamonds are carefully selected, then treated extensively to remove any impurities, then shape milled to impart the blockiest shapes and remove any planes of weakness if present, and then chemically treated to enhance their retention characteristics to provide the cutting edge to your bond.

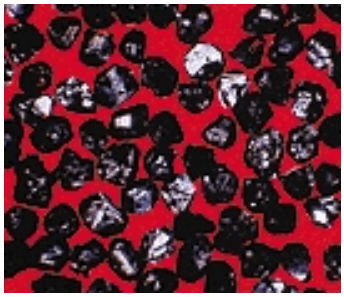
This product line is characterized by blocky shapes, low inclusions, high hardness, toughness and fracture strength, and exceptional thermal stability to endure the most demanding operating conditions for a host of applications Compatible with both sintered metal bond systems as well as electroplated bond systems, these powders are available in the entire range of mesh and sub-sieve sizes. Different qualities of diamond powders are available depending upon the application. For example, the more friable type diamonds are recommended for low impact and high contact area applications such as mirror edging, glass beveling, hand files and burrs etc. The medium hard diamonds are used for medium impact applications such as marble and granite trimming/polishing and burr grinding etc., while the toughest diamonds are available for demanding high impact applications such as rough polishing, grinding, form tool manufacture, reinforced concrete, slabbing and wire-sawing.

Resin Bond Synthetic Diamond Powder



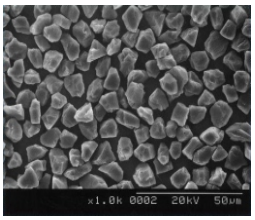
Resin Bond Diamond powder is used in applications involving machining of tungsten carbide, glass, and ceramics. Primarily used in resin bond, and vitreous bond systems, the unique property of this *multicrystalline* type of diamond powder is its ability to *microfracture*. Thousands of minute, tightly bonded crystals of diamond make up one grain of resin bond diamond powder. These crystals are engineered to micro-fracture on loading to continuously present sharp edges for cutting. This unique ability to micro-chip drastically reduces machining time resulting in enormous cost-saving by maximizing productivity while imparting exceptional finish to the workpiece.

Cubic Boron Nitride (CBN)



CBN is used in applications involving machining of ferrous materials, tool steels and hardened super-alloys where Synthetic Diamond Powder cannot be used. Available in the entire range of sizes, this is the singular answer to the requirements of machining exotic materials with a performance that is second to none. High productivity and superlative performance is the hallmark of CBN incorporated tools resulting in substantial cost saving compared to the production levels that may be attained by tools using conventional abrasives.

Graded Synthetic Diamond Micron Powder



With advances in technologies, arise requirements where improved surface finish and luster is of prime importance. The answer to these evolving requirements is a dynamic target of tighter graded products. Our range of graded micron powders uses the best diamonds, which are tightly graded using state of the art equipment; then passed through rigorous quality control procedures to check for size distributions, shape factors and purity.

The advantage of using tightly graded diamond powders is made apparent by the following illustration. The first figure shows the performance of ungraded/broadly classified diamond powder when applied to a work-piece. As shown, at the plane of contact, the larger particles of diamond are the only ones that are being used, resulting in increased stress on the diamond crystals which ultimately causes their failure, and also increases the probability of scratch formation due to a limited number of crystals effecting material removal. Figure 2 shows the multiple points of contact, which are generated by the use of graded diamond micron powder. This not only reduces the stress on the individual diamond crystals resulting in longer life but also results in improved surface finish as all the crystals evenly effect material removal, thus reducing the susceptibility of scratch formation.

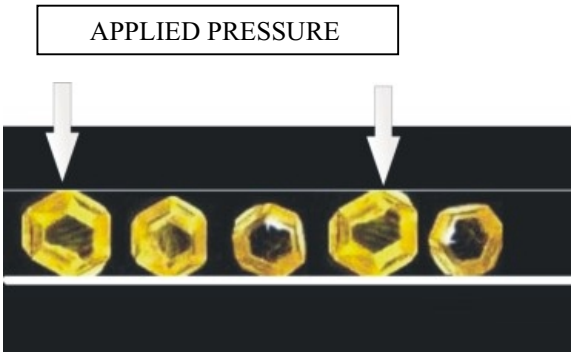


Fig. 1: Illustrating Limited Points of Contact Using Ungraded Diamond Powder, Resulting in Scratch Formation

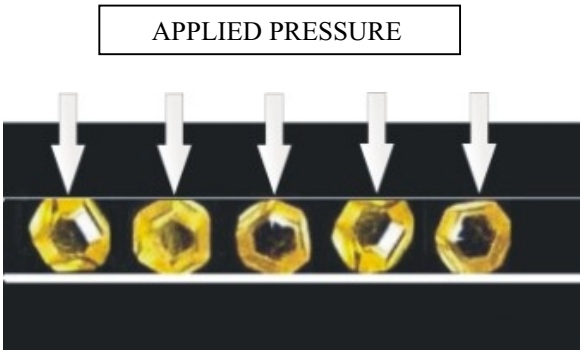


Fig. 2: Illustrating Multiple Points of Contact Using Graded Diamond Powder, Resulting in Improved Surface Finish.

Our range of premium graded micron diamond powder is available in every conceivable size range. However, we acknowledge while that our standard product line is sufficient for most applications, your requirements may be unique to your production process, be it lapping or honing or polishing. We commit our every resource to provide you with the graded micron powder of your specification. Our team of committed and highly motivated engineers is dedicated to make our range of graded micron powders the final answer to your surface finish requirements.

Standard Available Grades of Synthetic Diamond Micron Powder*

0	-	0.25	P		5	-	10
0	-	0.5	O	L	8	-	12
0	-	1	L	A	10	-	15
0	-	2	I	P	10	-	20
0	-	3	S	P	15	-	25
1	-	2	H	I	20	-	30
1	-	3	I	N	25	-	35
2	-	4	N	G	30	-	40
4	-	8	G		40	-	50

** Non-Standard Sizes Accomodated as per Individual Request*

Standard Grit Size Chart Showing US Mesh Sizes and FEPA Standard

US Mesh Size	FEPA	Micron Range	Pieces Per Carat	Size in Inches
20/30	D851	600-800	97	**0.033**
30/40	D602	425-600	460	**0.025**
40/60	D427	250-425	1334	**0.018**
60/80	D251	181-250	10400	**0.011**
80/100	D181	151-181	17410	**0.008**
100/120	D151	127-151	20920	**0.007**
120/140	D128	107-127	49400	**0.006**
140/170	D107	90-107	83400	**0.005**
170/200	D91	75-90	140000	**0.004**
200/230	D76	63-75	25200	**0.0035**
230/270	D64	53-63	384000	**0.003**
270/325	D54	45-53	66000	**0.002**
325/400	D46	38-45	1130000	**0.0017**