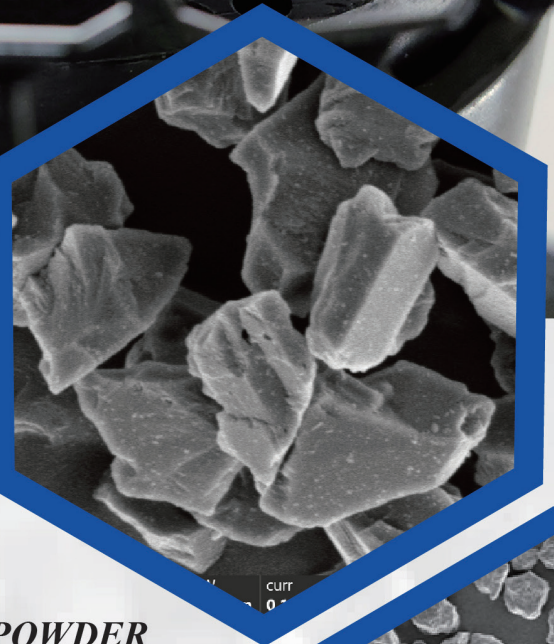
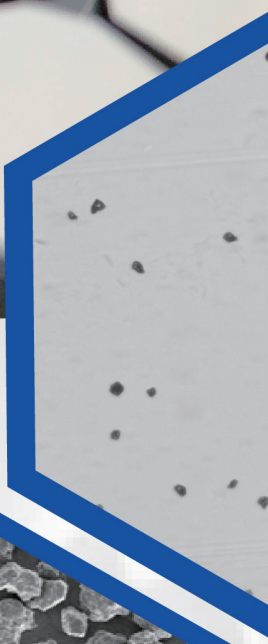
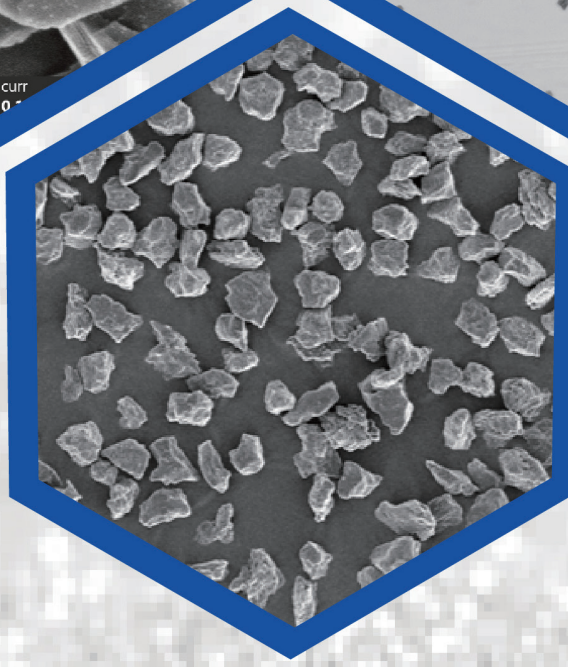
DIAMOND POWDER AND APPLICATION

World-leading diamond powder







- **QPD** *POLY MICRO DIAMOND POWDER*
- **QMM** *MONO MICRO DIAMOND POWDER*
- **QND** *NANO MICRO DIAMOND POWDER*
- **QMR** *ROUND MICRO DIAMOND POWDER*
- **QH** *MODIFIED DIAMOND POWDER*
- **QD** *MODIFIED DIAMOND POWDER*

CREATE ENDLESS POSSIBILITIES WITH THE POWER OF DIAMOND

Qual Diamond
Hi-tech Corporation

ABOUT OUR DIAMOND POWDER

Qual Diamond categorizes our synthetic diamond powders by the physical properties of the raw materials and chemical treatment methods. We have both monocrystalline and polycrystalline diamond powders with different treatment methods. They are categorized as QMM HPHT Monocrystalline Diamonds, QPD Detonated Polycrystalline Diamonds, QND Nano Diamonds, and QMR Round Diamonds. Our treatment methods offer Hydrophilic (H), and Deagglomerated (D) series types. Qual Diamond's surface modification technology and latest size treatment methodology can prevent the agglomeration of particles, which consistently yields narrow and precise size distribution. Ultimately, our diamond powders are the optimal solution for lapping and precision polishing of super hard materials such as silicon carbide, tungsten carbide, sapphire, spinel, ruby, optical fiber materials, and many other advanced material substrates found in manufacturing for optics, semiconductors, advanced ceramics, and metals.

HOW TO CHOOSE DIAMOND PRODUCTS

QPD/QPH Poly Micro Diamond Powder
QMM Mono Micro Diamond Powder
QMR Round Micro Diamond Powder

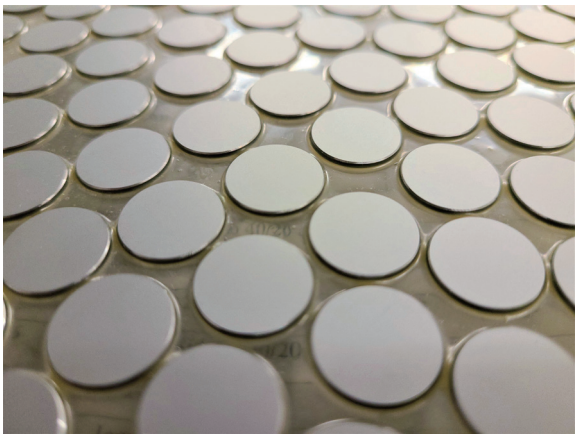
QND Nano Micro Diamond Powder
QD Modified Diamond Powder
QH Modified Diamond Powder

INTRODUCTION:

Selecting and matching the right type and size of diamond powder with your specific process requirements are of vital importance. We have extensive knowledge and expertise in the application of micron and nano diamond. We are very happy to provide you with the right solutions for your needs.

Our micro and nano diamond powders consist of uniform size, high purity diamond particles thanks to our advanced surface modification technology. The unique nano carbon particle treatment technology can prevent the re-aggregation problem of particles during any application process, delivering precise and narrow size distribution. The uniform particle shape results in high material removal rates when used in grinding and lapping applications.

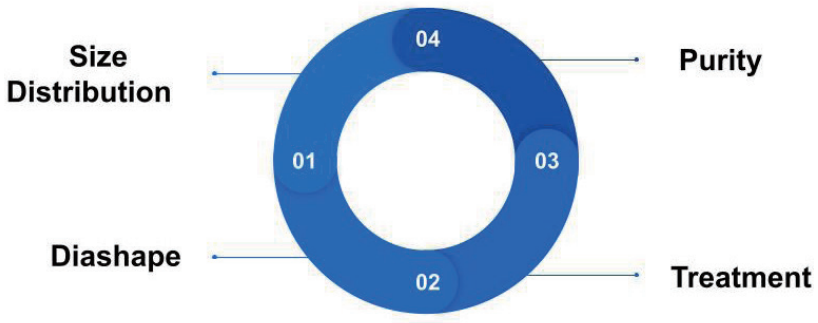
Our synthetic monocrystalline and polycrystalline diamond powders cover a full range of sizes which are ready to be used for a variety of applications and research projects.



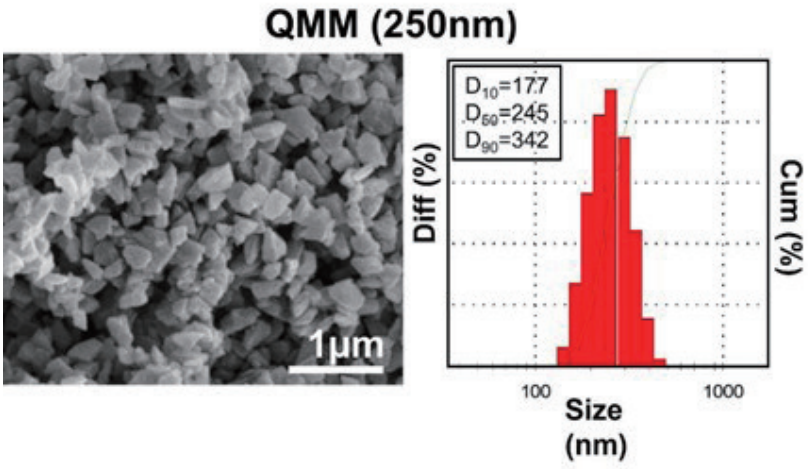
AVAILABLE SPECIFICATION:

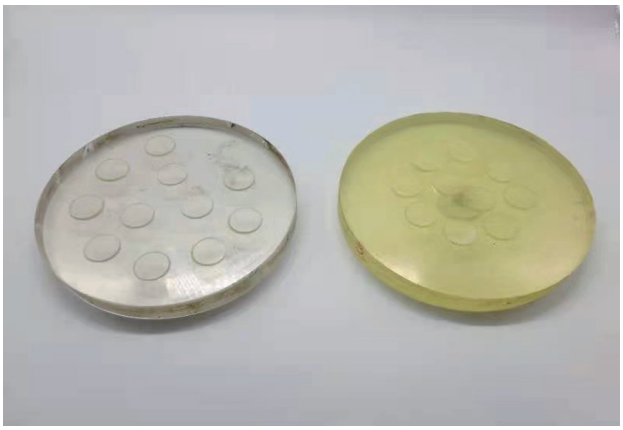
Categories	50nm	100nm	0-0.25	0-0.5	0.5-1	1-2	1-3	2-3	3-5	4-6	6-12	7-10	10-20	20-30	30-40	40-50
QMM	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■
QPD	■	■	■	■	■	■	■	■	■	■	■	■				
QMR													■	■	■	■
QND	■	■	■													
QD	■	■	■	■	■											
QH	■	■	■	■	■											

CUSTOMIZATION SERVICE



QMM
MONO MICRO DIAMOND POWDER





INTRODUCTION:

QMM is our Monocrystalline Micro Diamond Powder made using a high pressure and high temperature (HPHT) method. The QMM diamond particles have an oriented crystal structure with parallel-running planes, which are very similar to natural diamond. It is one of the hardest and purest carbon-based materials after Qual Diamond's unique treatment, which offers our customers with high efficiency, low time-consuming lapping and precision polishing process. The blocky particle shape ensures high stock removal rate during grinding and polishing. Through our advanced surface modification technology, the diamond particles have clean surface, high purity, narrow and precise size grading. Thus, our QMM diamond micron power can give you first-class results regarding performance, quality, consistency, and reproducibility.

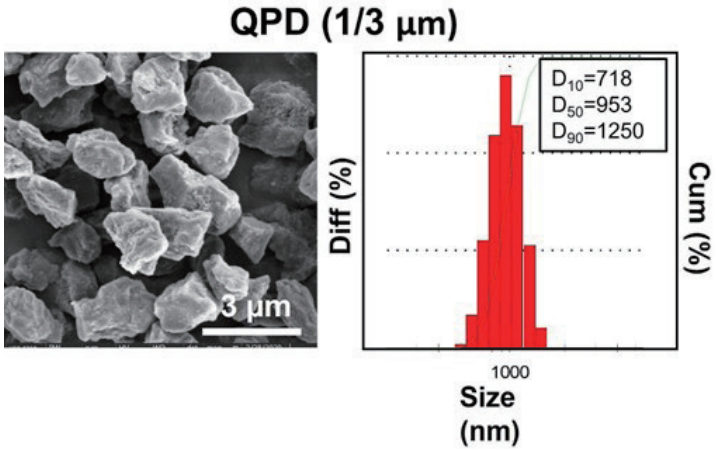
BENEFITS:

- High hardness and toughness
- Blocky shape particles give high stock removal rate with good surface quality
- Unique surface modification technology renders clean surface, high purity particles with precise and narrow size distribution
- Excellent thermal and chemical stability

APPLICATIONS:

- Grinding, lapping, and polishing of materials with hardness over 6 on Mohs scale such as silicon carbide, tungsten carbide, germanium, sapphire, spinel, ruby, optical fiber, etc.
- Loose particle applies to lapping and polishing of ceramics, metals, wire drawing stones, PCD blanks, jewelry stones
- Wear-resistant surface coatings
  Thermal conduction
- Grinding tools

QPD
POLY MICRO DIAMOND POWDER



INTRODUCTION:

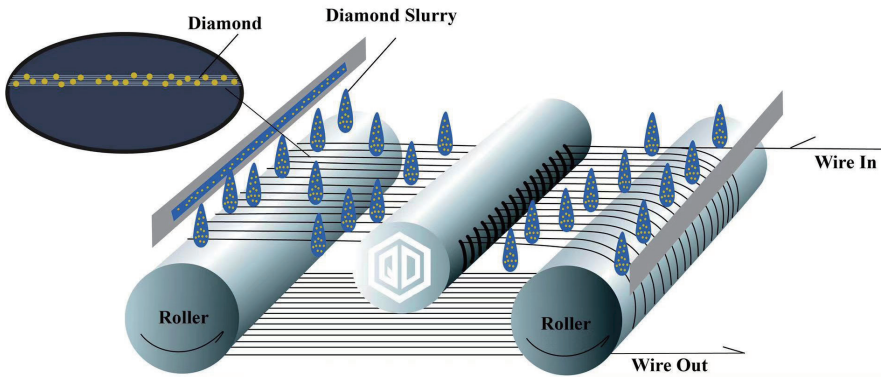
QPD is our Polycrystalline Micro Diamond Powder made by detonation synthetic method. The QPD particles have extremely rough surface with numerous sharp cutting points due to its multi-crystalline structure. Individual crystallites break out of the particle under certain pressure creating new cutting points. Thereby, QPD particles have self-sharpening property which can maximize removal rates throughout the whole process. As QPD particles are equally hard in all directions, the abrasion is independent of particle orientation. The major challenge of using polycrystalline diamond powder is to have high purity and agglomeration/ aggregation free particles. Our advanced surface engineering technology successfully mitigates all the issues and delivers high quality polycrystalline micro diamond powder with high purity, free aggregations, precise and narrow size grading. Our QPD performs fabulously when processing semiconductor, advanced composites, optical glass with the added benefit of scratch free surface. Overall, our QPD provides first-class quality and more consistent results for your application.

BENEFITS:

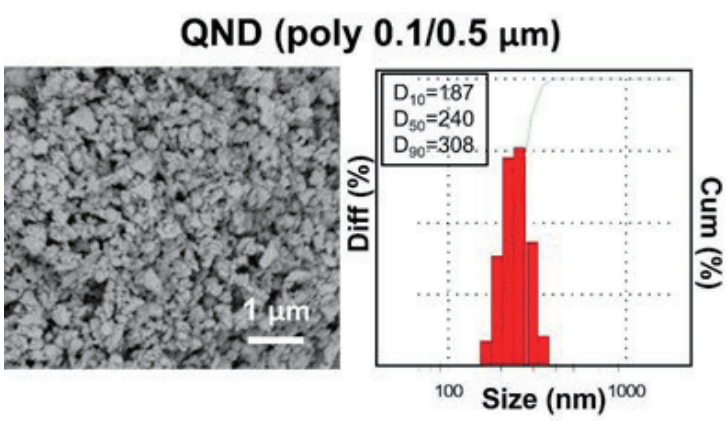
- Large numbers of contact points with rough surface and self-sharpening property ensure high material removal rates
- Very uniform and super high-quality surface finish
- Advanced surface engineering technology delivers aggregation free, high purity diamond powder
- Precise and narrow size distribution

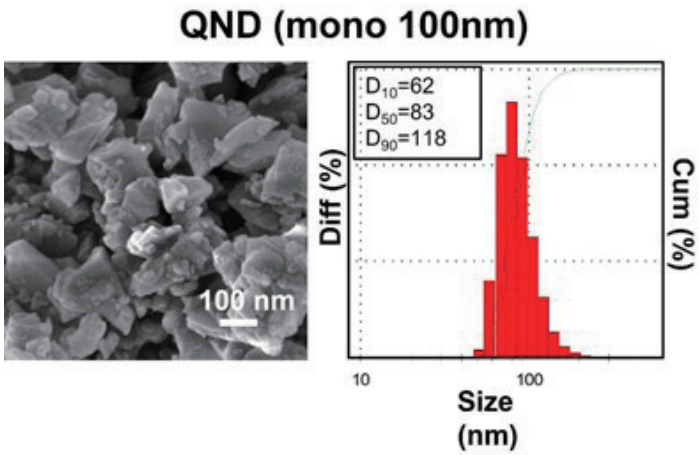
APPLICATIONS:

- Lapping and polishing a variety of surfaces that require superior smoothness
- Material for diamond slurries
- Material for liquid diamond abrasive, gel diamond abrasive
- Material for diamond abrasive tools
- Anti-wearing media in rubber and plastics
- Used as chemical catalyst, biomedicine
- Lapping and polishing semiconductor material, advanced composites, optical glass, ceramics, metal, synthetic precious stones, gemstones



QND
NANO MICRO DIAMOND POWDER





INTRODUCTION:

QND is our Nanosized Diamond Powder made by HPHT method or detonation method with sizes <1μm. We carry both monocrystalline and polycrystalline nano diamond powder. Through our advanced surface modification technology, QND possesses characteristics of high purity , aggregation-free, and narrow size distribution which are very important for nano diamond applications. Unwanted oversized particles are not present thanks to our advanced particle sizing technology. The difficult problem in optical polishing can be easily solved by our QND diamond powder. And the final surface finishing/roughness can be polished to reach 1nm. Overall, we provide consistent, reproducible nano diamon powder for your application.

BENEFITS:

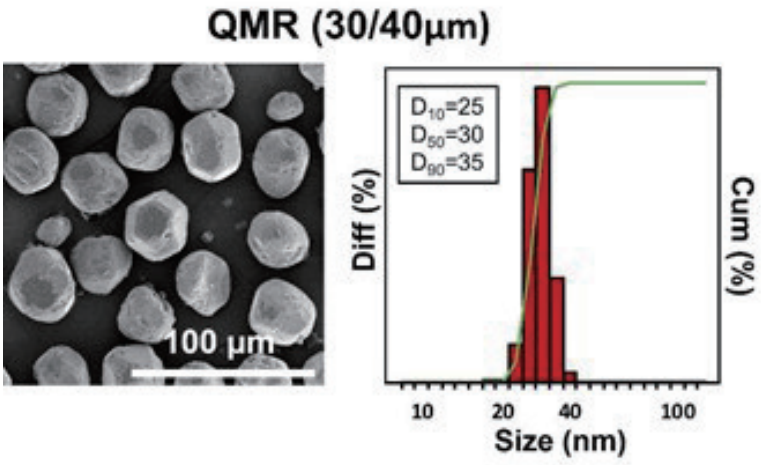
- Advanced surface modification technology guarantees high purity, agglomeration-free nano diamond powder with narrow size distribution
- Advanced particle sizing technology ensures the absence of unwanted oversized particles rendering precise and narrow size grading
- High hardness and chemical resistance proving good mechanical and chemical properties for coatings and paints
- Non-toxic

APPLICATIONS:

- Advanced surface modification technology guarantees high purity, agglomeration-free nano diamond powder with narrow size distribution
- Advanced particle sizing technology ensures the absence of unwanted oversized particles rendering precise and narrow size grading
- High hardness and chemical resistance proving good mechanical and chemical properties for coatings and paints
- Non-toxic

Sapphire

QMR
ROUND MICRO DIAMOND POWDER



INTRODUCTION:

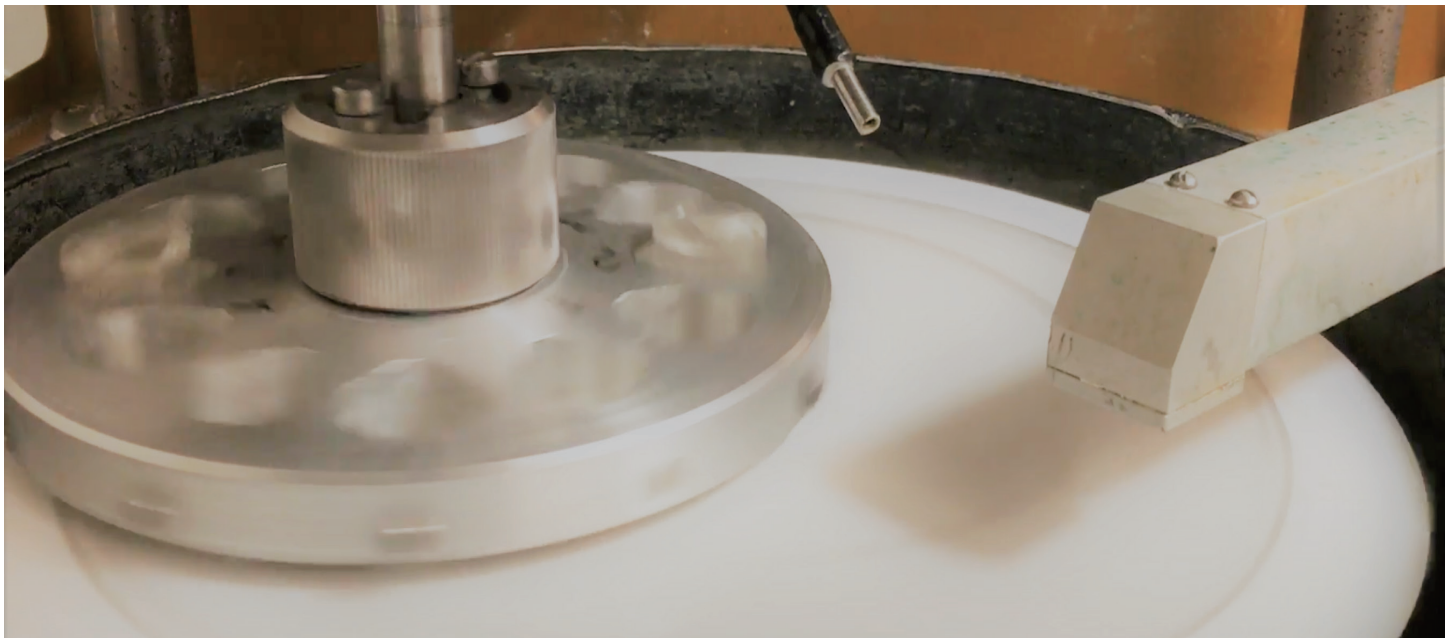
QMR is our round monocrystalline micro diamond powder prepared by our unique surface treatment. Due to the non-angular feature of the diamond, it reduces cutting depth of material during grinding leading to high precision processing. QMR synthetic diamond is best applied to high-precision surface processing. For example, using our QMR diamond powder for wafer back grinding it increases processing efficiency by 15% compared to other types of diamond powder.

BENEFITS:

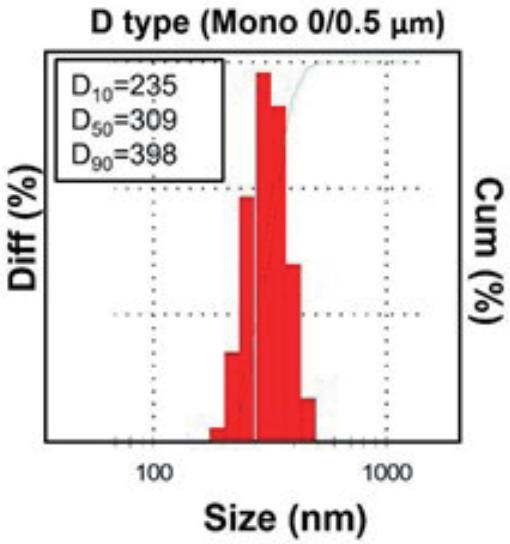
- High purity round monocrystalline diamond powder
- Uniform size and surface
- Super narrow and precise size distribution
- Non-angular shape suitable for high precision processing

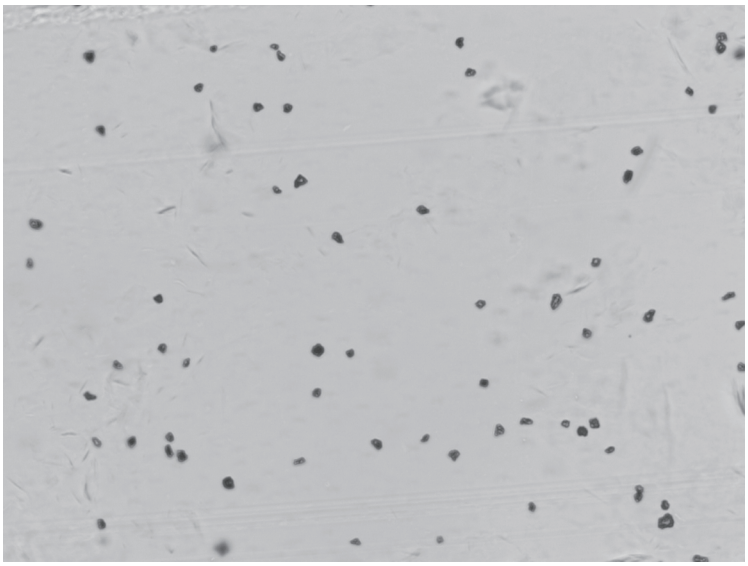
APPLICATIONS:

- Semiconductor wafter back-grinding
- Optical grinding
- Non-ferrous metal high-precision grinding
- Ultra-high precision grinding wheel dresser



QD
MODIFIED DIAMOND POWDER





INTRODUCTION:

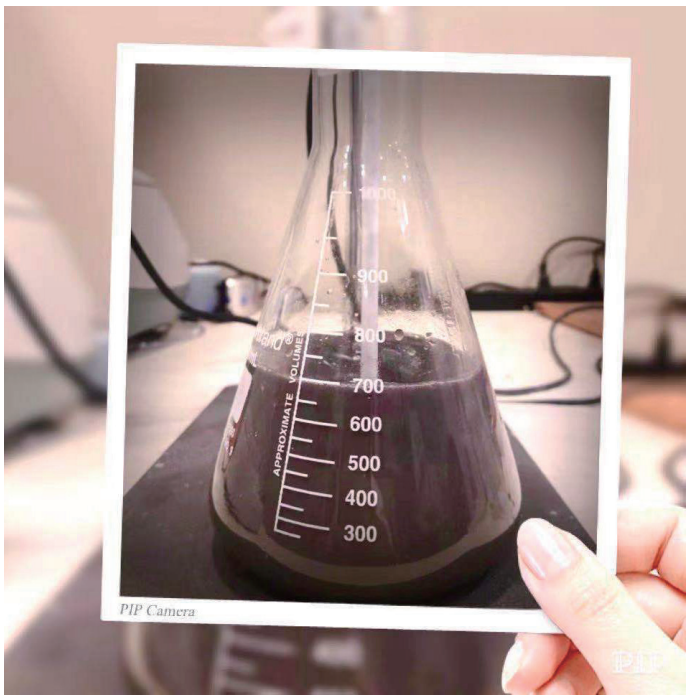
The Deagglomerated (D) type of diamond powder was prepared and specially treated to have high purity and the lowest magnitude of aggregation. The special treatment helps remove non-diamond impurities making it a good additive material for many different industrial applications. The narrow and symmetric size distribution is presented in the D type diamond powder. We developed the technology in response to the need for polishing solutions free of unwanted aggregation. It helps avoid scratching the surfaces and increase the yield of finished products, which brings enormous benefits for any polishing application. This QD diamond powder is highly regarded by our customers for their outstanding performance.

BENEFITS:

- The unique treatment brings the highest purity to the diamond powders
- Advanced surface modification prevents agglomeration/aggregation of particles
- Good stability in polar media
- Narrow size distribution delivers outstanding performance in polishing
- High hardness and toughness allow for high material removal rates

APPLICATIONS:

- Good source of additive materials
- Grinding and polishing of non-ferrous alloys, advanced composite, ceramics, gems, optical glass, quartz and other hard materials
- Material for diamond slurry and suspension
- Material for diamond polishing pads, wheels and all kinds of diamond tools
- Material for Polycrystalline Diamond (PCD)



QH
MODIFIED DIAMOND POWDER

INTRODUCTION:

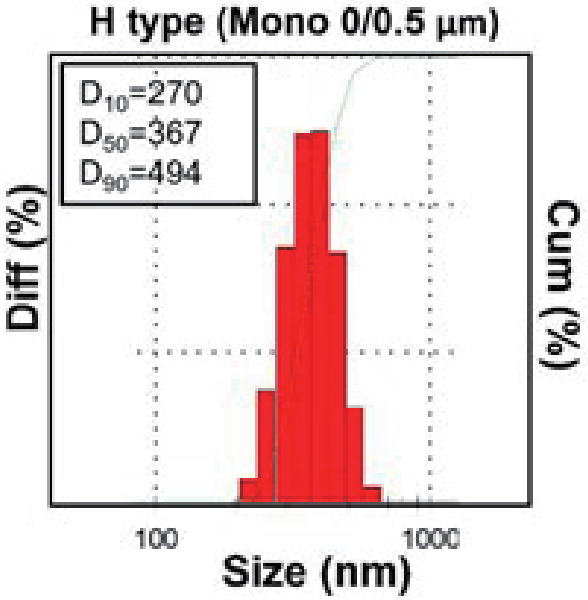
The Hydrophilic (H) type of diamond powder was prepared and treated to have a hydrophilic surface making the diamond powder easily disperse in polar media. The high magnitude of zeta potential of H type diamond powder ensures good stability of the suspension. The narrow and symmetric size distribution curve is attributed to the strong electrostatic repulsion between the H type particles. The distinct deagglomeration effect can improve the mechanical polishing result.

BENEFITS:

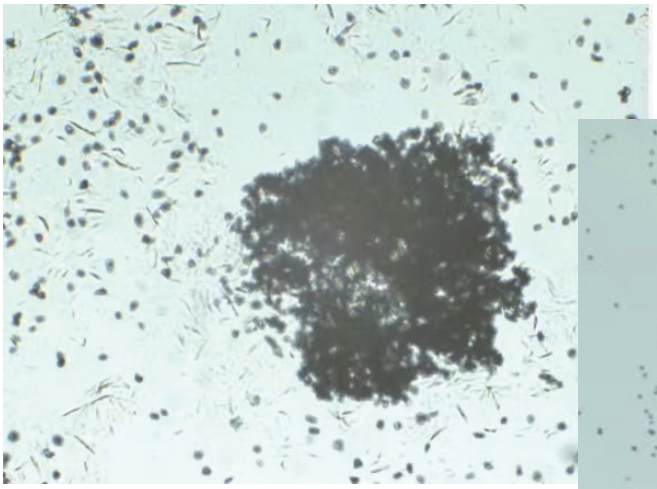
- Advanced surface engineering technology prevents agglomeration/aggregation of diamond particles
- Narrow and symmetric size distribution deliver outstanding performance for any application
- High hardness and toughness allow for high material removal rates
- Very good stability in polar media

APPLICATIONS:

- Grinding and polishing of alloys, advanced composite, ceramics, gems, optical glass, quartz and other hard materials
- Material for diamond slurry and suspension
- Material for diamond polishing pads, wheels and all kinds of diamond tools
- Material for Polycrystalline Diamond (PCD) Compacts



WITHOUT TREATMENT



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