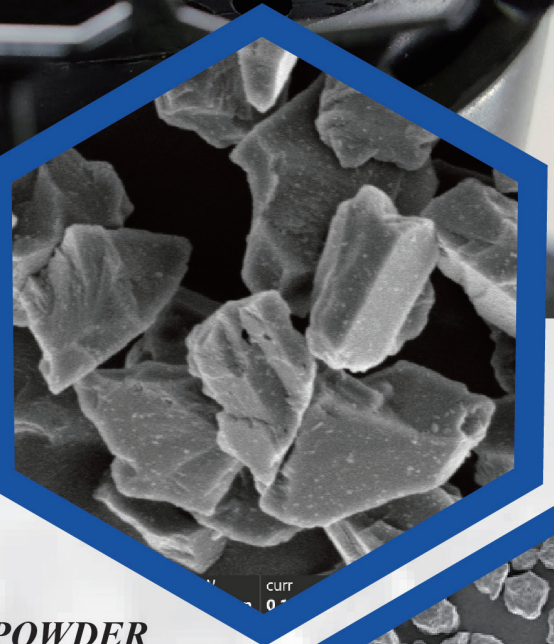
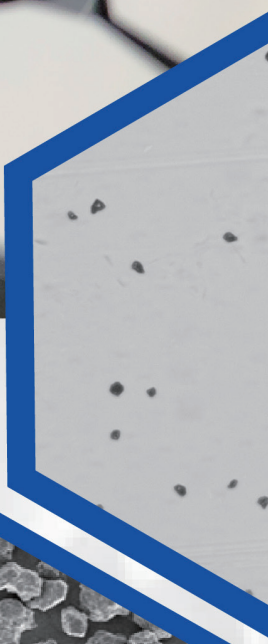
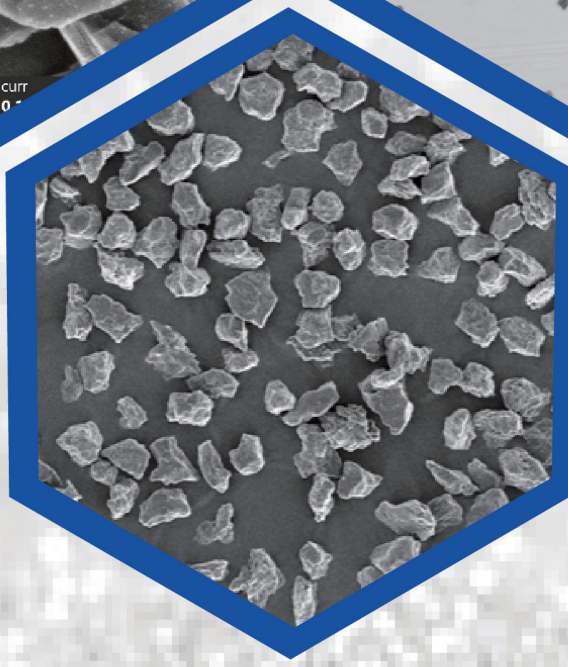
# DIAMOND POWDER AND APPLICATION

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 diamond powders are classified based on the physical properties of the diamonds and chemical treatment methods. QPD stands for Qual Diamond Polycrystalline Diamond. QMM stands for Qual Diamond Monocrystalline Diamond. QND stands for Qual Diamond Nano Diamond. QMR stands for Qual Diamond Round Diamond. All these diamonds with different physical properties are further classified based on the results of 2 different surface treatment methods: 1) Deagglomerated (D) or 2) Hydrophilic (H).

Qual Diamond's proprietary surface treatment technology enables the deagglomeration of diamond particles, creating homogeneous suspension of diamond particles in fluid matrixes and narrow size distribution. Qual Diamond's treated diamond powders are suitable for lapping and polishing materials high on the Vickers scale, such as silicon carbides, tungsten carbide, sapphire, spinel, sapphire, and many other advanced materials found in the components of semiconductors, electronics, optics and photonics, spacecraft, and more.

# HOW TO CHOOSE DIAMOND PRODUCTS

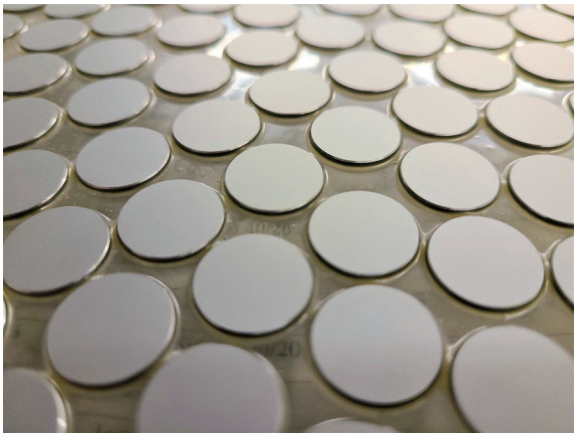
**QPD/QPH Poly Micro Diamond Powder**
**QMM Mono Micro Diamond Powder**
**QMR Round Micro Diamond Powder**

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

## INTRODUCTION:

The success of a project often hinges on using the right kind of diamond powder for lapping or polishing. It is thus critically important to select the correct type and size of diamond powders according to the project requirements. Qual Diamond's proprietary surface modification technology makes the job of choosing the right diamond powders easy. Qual Diamond's treated nano- and micro-diamond particles are non-agglomerated, highly uniform in size, and highly pure. The unique deagglomeration treatment also means higher material removal rates due to the presence of unburied, abundant sharp edges.

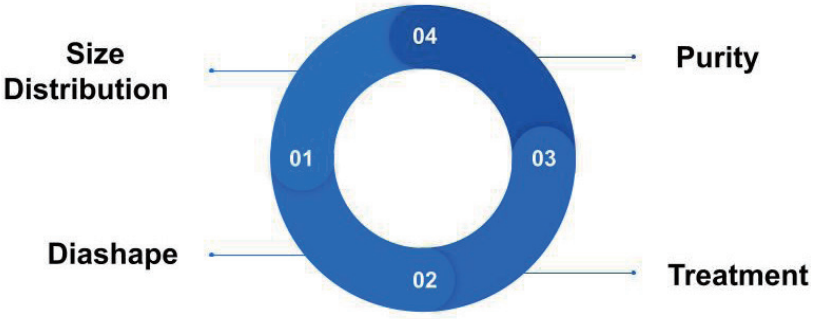
Qual Diamond's diamond powders cover a wide range of sizes suitable for a wide variety of lapping and precision polishing projects for different materials. If you have any questions regarding the right diamond products for your projects, contact Qual Diamond at 1-858-263-4358 or sales@qualdiamond.com. One of our highly qualified associates will be more than happy to assist you!

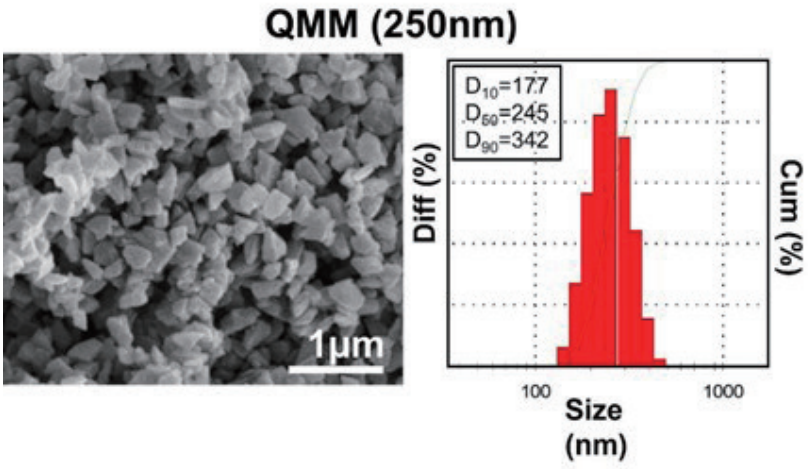
## AVAILABLE SPECIFICATION:

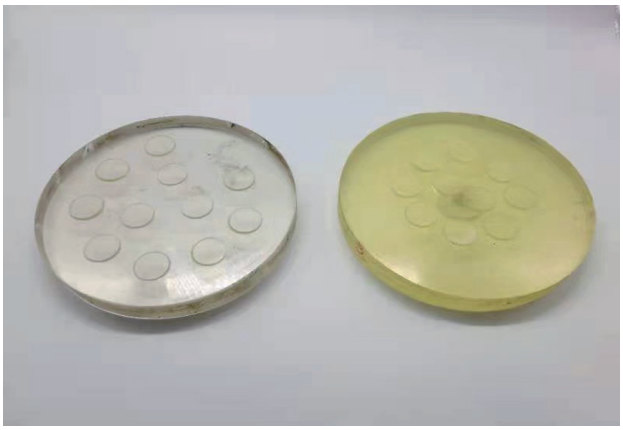
| Categories | 50nm | 100nm | 0-0.25 | 0-0.5 | 0.5-1 | 1-2 | 1-3 | 2-3 | 3-5 | 4-6 | 6-12 | 7-10 | 10-20 | 20-30 | 30-40 | 40-50 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| QMM | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ | ■ |
| QPD | ■ | ■ | ■ | ■ | ■ |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

## CUSTOMIZATION SERVICE



# QMM
## QUAL DIAMOND MONO MICRO DIAMOND POWDER



### INTRODUCTION:

QMM diamond powder are synthesized by the high pressure-high temperature (HP-HT) method. The QMM diamond particles have an oriented crystal structure with parallel-running planes similar to natural diamond. It is one of the hardest and purest carbon-based materials after Qual Diamond's unique surface treatment, offering a high-efficient, low time-consuming solution for lapping and precision polishing. The blocky particle shape ensures a high stock removal rate during grinding and polishing. Qual Diamond's advanced surface modification technology produce diamond particles with a clean surface, high purity, and narrow size distribution. Expect first-rate results in terms of performance, quality, consistency, and reproducibility from QMM.

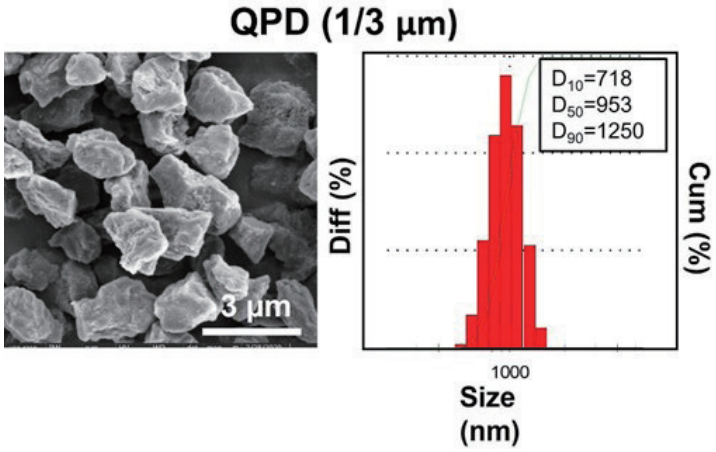
### ADVANTAGES:

- High hardness and toughness.
- High stock removal rate with good surface quality.
- Clean surface, high purity, narrow size distribution.
- Excellent thermal and chemical stability.

### APPLICATIONS:

- Grinding, lapping, and polishing of materials with hardness over 6 on Mohs scales, such as silicon carbide, tungsten carbide, germanium, sapphire, spinel, ruby, optical fiber, etc.
- Lapping and polishing of ceramics, metals, wire drawing stones, PCD blanks, and jewelry stones.
- Coatings for wear-resistant surfaces and thermal conductivity.
- Grinding tools.

# QPD
## QUAL DIAMOND POLY MICRO DIAMOND POWDER




### ADVANTAGES:

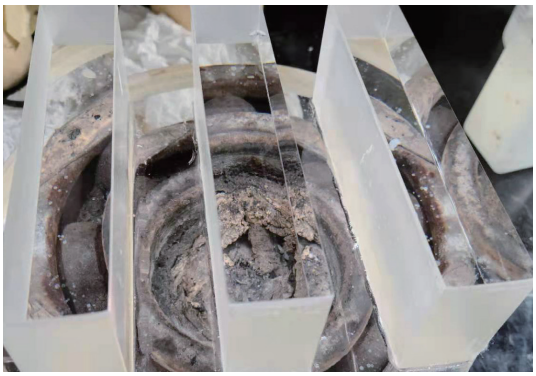
- Rough surfaces with abundant contact points deliver high material removal rates.
- Precise and high-quality surface finishes.
- Advanced surface treatment prevents agglomeration.
- High purity, narrow size distribution.

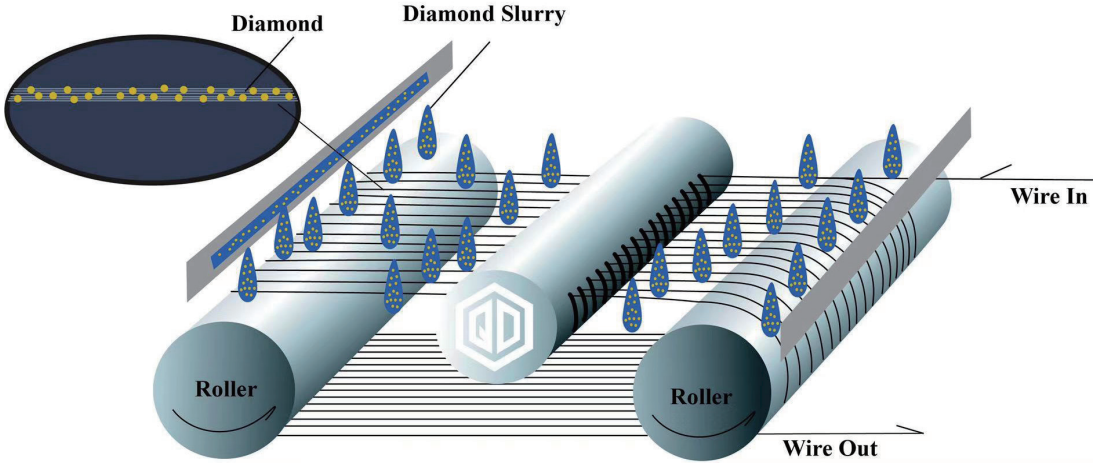
### INTRODUCTION:

QPD diamond powder are created by the detonation-synthesis method. The QPD particles have highly irregular surfaces with numerous sharp edges due to its multi-crystalline physical property. Individual crystallites can break off the particle under stress to create new cutting edges, greatly improving material removal rate (MMR). Low purity and agglomeration of diamond particles are the common problems associated with polycrystalline diamond powder. Qual Diamond's advanced surface modification technology eliminates these problems and delivers high-quality polycrystalline diamond powders free of impurities and aggregation with narrow size distribution. Expect consistent results and a precise finish free of blemishes with QPD polycrystalline diamond powder.

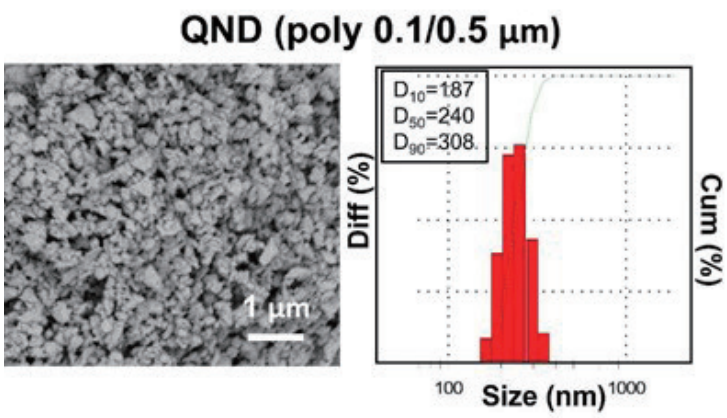
### APPLICATIONS:

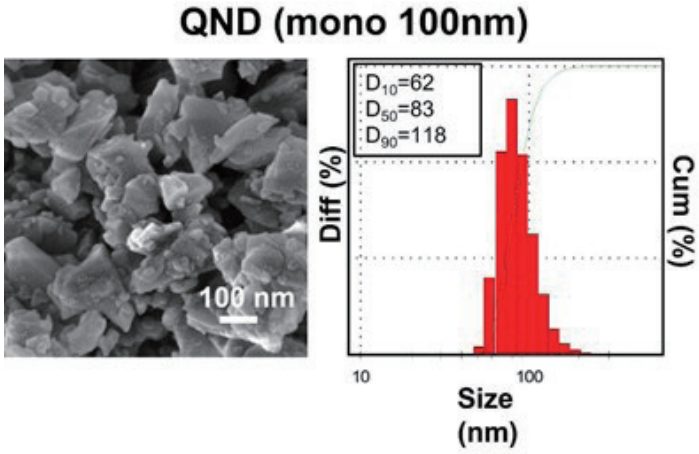
- Lapping and polishing a variety of materials for semiconductor, photonics and optics, advanced ceramics and composite materials that require superior finishes.
- Coatings for wear-resistant surfaces and thermal conductivity.
- Abrasives for wire saws and other tools.
- Abrasives for diamond slurries/gels.
- Seeding materials.





# QND
## QUAL DIAMOND NANO DIAMOND POWDER




## INTRODUCTION:

QND nano-diamond powder are synthesized by the high pressure-high temperature (HP-HT) and detonation method with sizes in submicron levels. Qual Diamond nano diamond powder are available in both monocrystalline and polycrystalline forms. After being treated with Qual Diamond's advanced surface modification technology, QND nano diamond powder acquire desirable properties such as high purity, non-aggregation, and narrow size distribution. As a result, unwanted oversized particles that cause digs and scratches are also eliminated. All these attributes are very important for nano diamond applications, which require precise and scratch-free finishes. Final surface roughness in angstroms can be achieved with QND nano diamond powder. Expect consistent and reproducible results for your application using QND nano diamond powder.

## ADVANTAGES:

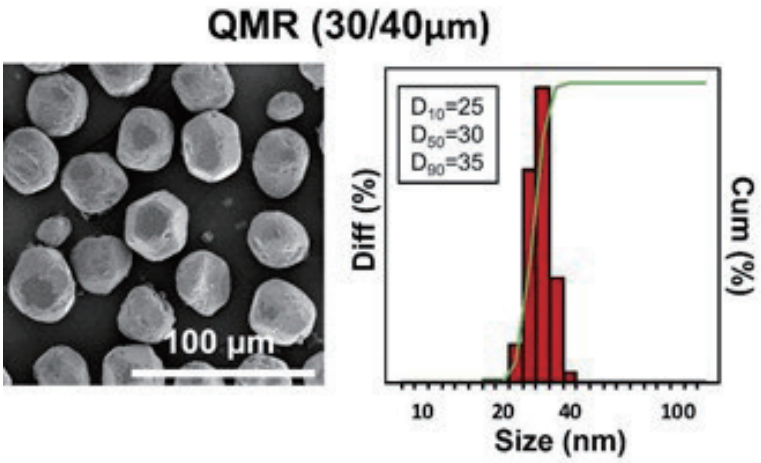
- Precise and high-quality surface finishes.
- Advanced surface treatment and sizing technology guarantee highly pure, agglomeration-free nano diamond powder with narrow size distribution.
- Environmentally friendly.

## APPLICATIONS:

- Precision polishing of a variety of materials down to angstrom-level roughness.
- Coatings for wear-resistant surfaces and thermal conductivity.
- Abrasives for wire saws and other tools.
- Abrasives for diamond slurries/gels.
- Seeding materials.


Sapphire

# QMR
## QUAL DIAMOND ROUND MICRO DIAMOND POWDER





### INTRODUCTION:

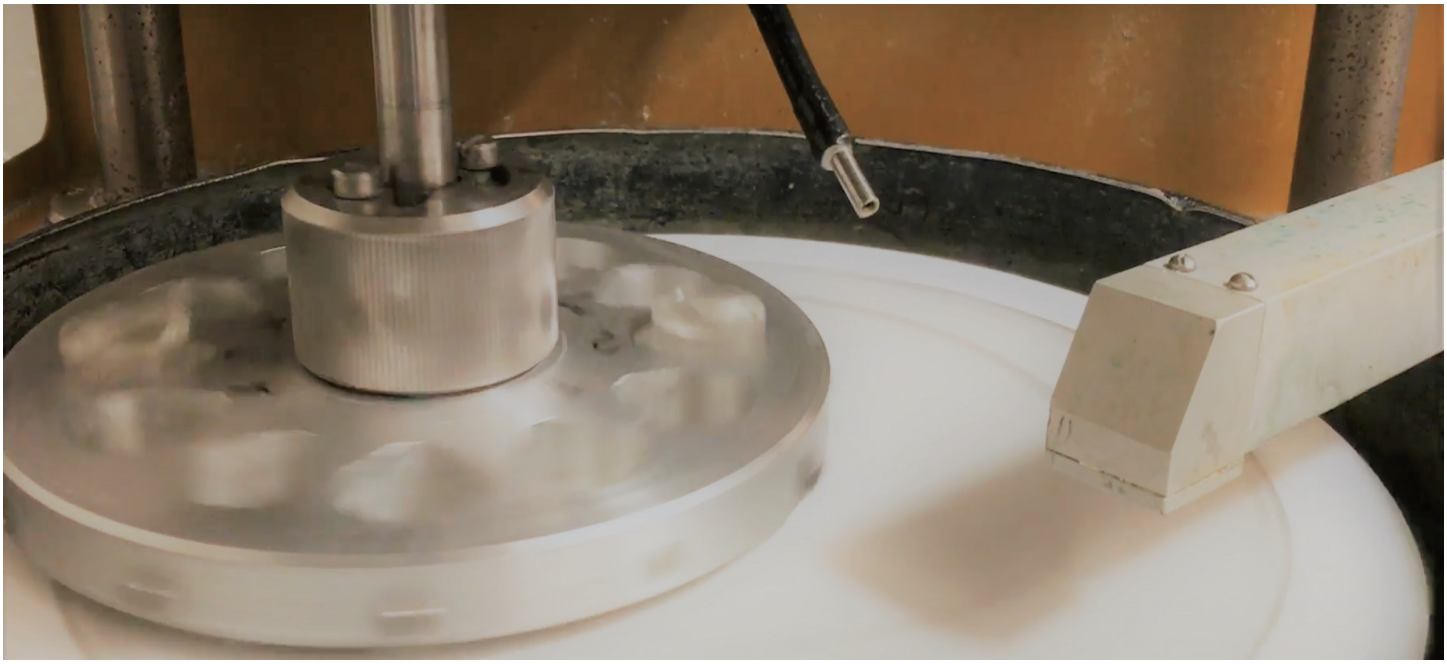
QMR is a unique diamond powder not commonly carried by suppliers. Qual Diamond's QMR monocrystalline micro diamond powder is treated with special surface modification technology. The round edges of the diamond particles reduce the cutting depth of materials during lapping, making high-precision processing possible. Qual Diamond's QMR round diamond powder has been shown to increase processing as compared to other types of diamond powder.

### ADVANTAGES:

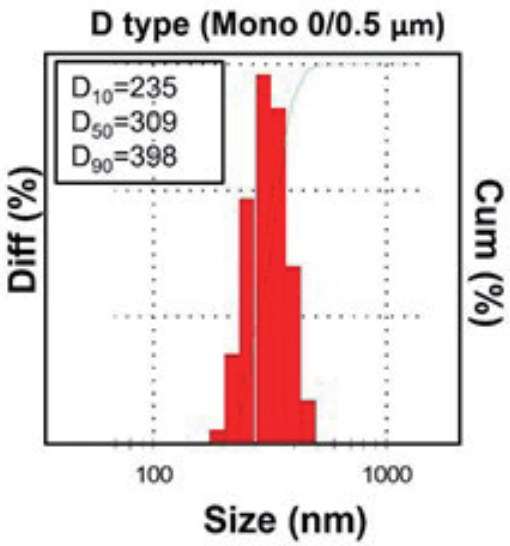
- High purity.
- Uniform size with narrow size distribution.
- Uniform surface geometry.
- Great for high-precision processing.

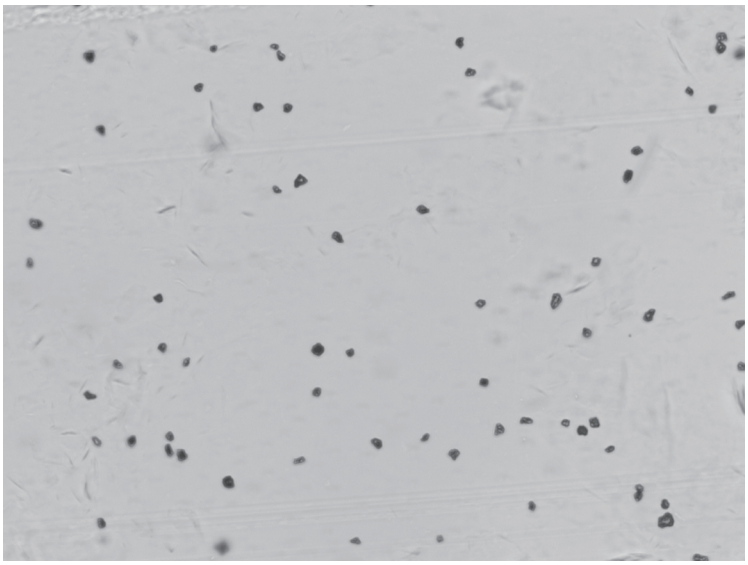
### APPLICATIONS:

- Semiconductor wafer back grinding.
- Optics grinding.
- Non-ferrous metals high-precision grinding.
- Dresser for ultra-high precision grinding wheel.



# QD
# QUAL DIAMOND MODIFIED DIAMOND POWDER



## INTRODUCTION:

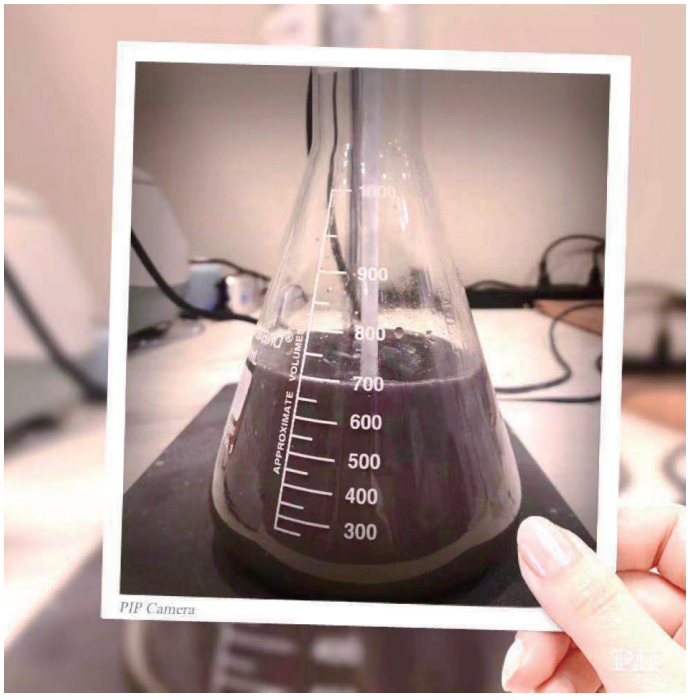
The Deagglomerated (D-) type of diamond powder is prepared and treated with Qual Diamond's unique surface modification technology to eliminate aggregation of fine diamond particles and achieve a high level of purity. Qual Diamond modified diamond powder is engineered for ultra-precision polishing of a variety of materials with unparalleled surface finishes free of scratches. The treatment also removes impurities, making Qual Diamond's QD modified diamond powder an ideal additive for a variety of industrial applications, such as oil and lubricant. The QD modified diamond powder is highly regarded by our customers for its outstanding performance.

## ADVANTAGES:

- High purity.
- Narrow size distribution.
- Advanced surface modification technology.
- High material removal rate.

## APPLICATIONS:

- Ultra-precision polishing of a variety of materials with high hardness indexes.
- Additives for various industrial applications.
- Seeding material.



# QH
# QUAL DIAMOND MODIFIED DIAMOND POWDER

## INTRODUCTION:

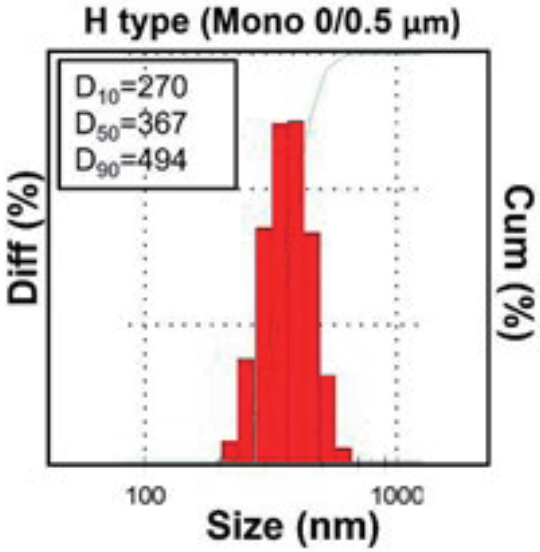
The Hydrophilic (H-) type of diamond powder is prepared and treated to confer water-loving property onto the surface of diamond particles. This property enables the diamond particles to disperse evenly and remain suspended in polar media. The high magnitude of zeta potential of the H-type diamond powder ensures a high degree of stability of the suspension. The strong electrostatic repulsion between the water-loving particles eliminates agglomeration, giving a narrow and symmetric size distribution curve. This also improves material removal rate and surface finish quality.

## ADVANTAGES:

- Advanced surface modification technology.
- No agglomeration/aggregation of diamond particles.
- High purity and stability.
- Narrow size distribution.
- High material removal rate.
- High-quality surface finish.

## APPLICATIONS:

- Grinding and polishing of alloys, advanced composite materials, ceramics, gems, optical glass, quartz, and other hard materials.
- Abrasives for diamond slurry and suspension.
- Abrasives for diamond polishing pads, wheels, and various diamond tools.
- Materials for Polycrystalline diamond compacts.

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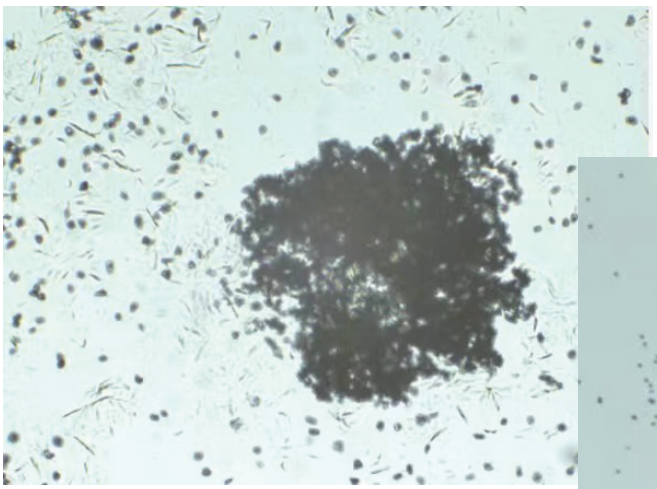

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# Qual Diamond

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