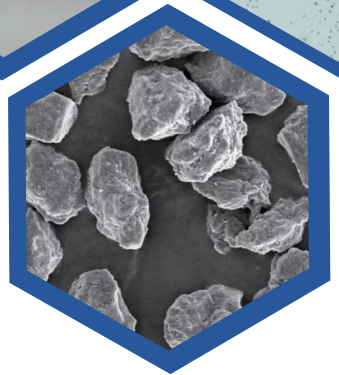


## Optimal Solution for Lapping & Precision Polishing

World-leading diamond slurries



- Hydroqual Diamond Slurry for Pitch
- Hydroqual Diamond Slurry for Pad
- Hydroqual Diamond Slurry for Plate
- Hydroqual Diamond Slurry for Diamond Wire Saw
- Hydroqual Diamond Slurry for Advanced Materials

CREATE ENDLESS POSSIBILITIES WITH THE POWER OF DIAMOND



**Qual Diamond**  
Hi-tech Corporation

# Company Overview

Qual Diamond specializes in developing and producing diamond powders and diamond slurries/-suspensions for precision polishing. Qual Diamond's success is powered by collaborative relationships with our customers, profound technical expertise, and dedicated workforce. Our technical team has 60+ years of combined experience in synthetic diamond, material science, and biotechnology.

Innovation and quality are in our DNA. Qual Diamond is the leading producer and supplier of highly deagglomerated and pure diamond nano- and micro-particles. Our proprietary surface treatment methods and stringent quality requirements deliver consistent results and cost benefits to our customers. Qual Diamond possesses two nanotechnology R&D laboratories with over 20 Intellectual Properties (IP) on surface modification technology. Qual Diamond is also ISO 9001 and ISO 14001 certified and compliant. We control every step of the process from procuring raw materials to producing finished products. We utilize high-precision instruments from Europe and the US for particle sizing, elemental analysis, and impurity detection. All raw materials are eco-friendly and recyclable.

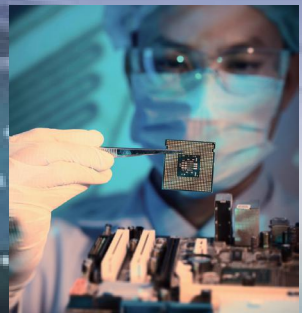
Whether your applications are in aerospace, photonics, electronics, advanced ceramics, automotive, or medical devices, our dedicated team is ready to help you develop a bright future and create endless possibilities with the power of diamonds.

## Our motto:

"Quality is Our Life; Customers Are Our Priority."

## Our Mission:

Become the best-in-class manufacturer and supplier of diamond products for advanced industries.





# Hydroqual Diamond Slurry for Pitch



The final polish of precision optical components is usually achieved by using a pitch plate. It results in exceptional surface roughness and flatness in nanometer levels which is hard to be obtained by other techniques. However, the polishing process takes a significant amount of time. On top of that, there is a requirement for slurry formula not to chemically degrade the pitch. Improper selection of polishing slurries can cause surface imperfections in polishing high quality glass and optical components. The surface damages range from minor hairline cracks to large scratches and digs. Qual Diamond developed special formulated diamond slurries with unique formulation and powder treatment giving excellent surface finish without causing surface imperfections of workpiece and degradation of pitch plate. Moreover, our slurries are health and eco-friendly which is very suitable for manual operators. By using our slurries, it greatly reduces processing time, and improves polishing efficiency. Meanwhile it significantly increases the first-time yield (FTY) rate. Last but not least, it is very simple to use and clean with little training.

## Benefits:

- ◆ Health friendly and eco-friendly diamond slurry
- ◆ Excellent/mirror-like surface finish without causing imperfections
- ◆ Will not chemically degrade pitch plate
- ◆ Reduce processing time with high polishing efficiency
- ◆ Easy and fast cleaning process to decrease operation time and maintain friendly working environment





# Hydroqual Diamond Slurry for Pad



Pad polishing has versatile applications from copper, tungsten, wafer, to oxide, sapphire, silicon carbide and other ultra-hard nitrides. Combining the use of polishing slurries, the pad polishing can be used in successive steps to achieve a certain surface roughness or precision polished surface. However, using a polishing pad has its own challenges in selecting the right pad type with polishing slurries for specific applications. Qual Diamond is strategically positioned to provide solutions to meet customers' needs. Our designed solution package includes Qual Diamond's specific slurry with the compatible pad to be used together. Qual Diamond's advanced slurries are made with a family of Qual Diamond specific modified synthetic polycrystalline/monocrystalline diamond powders with high removal rates, less scratch, and tunable options that can provide superior surface performance. Qual Diamond unique slurry technologies provide aggregation-free particle dispersion, as well as the best pad surface protection. The performance of our diamond slurries is positively confirmed on multiple different types of polishing pads both in hard and soft materials. Specific surface requirements can also be achieved using our designed solutions.

## Benefits:

- ◆ Health friendly and eco-friendly diamond slurry
- ◆ Compatible with all common polishing pads
- ◆ Gives a perfect specific surface finish and eliminates any subsurface damage
- ◆ High material removal rate and efficiency
- ◆ Stable slurry with unique treatment for long lifetime



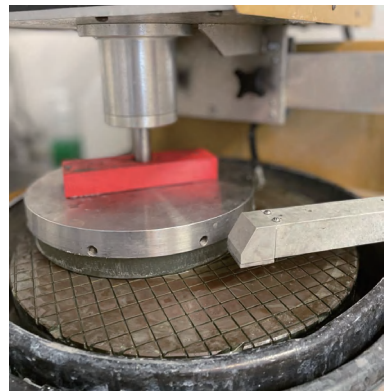


# Hydroqual Diamond Slurry for Plate

Qual Diamond's advanced slurries are the best choice for copper and resin CMP plates, which can provide safe and fast lapping of a wide range of metals, ceramics, crystals, glass. The lapping/polishing plate is usually very expensive to manufacture. Qual Diamond's advanced slurries contain the special designed formula that can form a protective film both on the surface of plate and workpiece reducing the surface damage. Thus, using the plate in combination with our slurries for lapping/polishing can ensure a longer service life of the plate. Lapping/polishing plates usually have different types of groove patterns for heat dissipation and material removal purposes. Our diamond slurries' special formulation has the right rheology that will not cause abrasive accumulation in the groove pattern while maintaining excellent lapping/polishing performance. Meanwhile, it is very easy to clean thoroughly after lapping/polishing processes. Overall, our ready-to-use diamond slurries combine high-quality components with chemical formulations and unique surface engineered diamond abrasives to provide an excellent material removal rate and surface quality. Specific surface roughness of the workpiece can be achieved through our designed solutions.

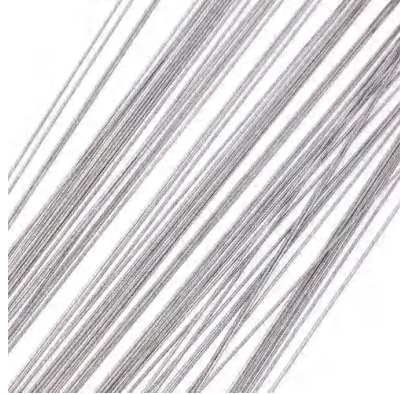
## Benefits:

- ◆ Health friendly and eco-friendly diamond slurry
- ◆ Gives a perfect specific surface finish and eliminates any subsurface damage
- ◆ High material removal rate and efficiency
- ◆ Slurry with unique formulation for long lifetime of plates
- ◆ The lowest rejection rate can save big margin production costs
- ◆ Easy and fast to clean-off decrease labor fee and environment maintain cost

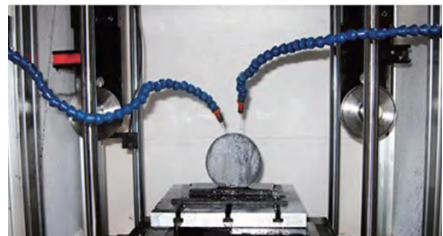
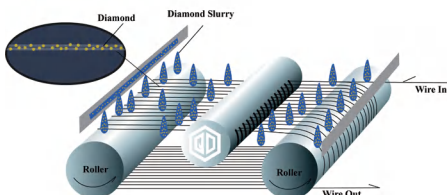




# Hydroqual Diamond Slurry for DiamondWire Saw



- ◆ Excellent adherence to cutting wire
- ◆ Eco-friendly antiaggregation formulation for high reproducibility
- ◆ High cutting speed and removing rate with better surface qualities
- ◆ Economical water free,anti-corrosive formula design



Precision Wire Saw diamond slurry and diamond Wire,for SiC ,Sapphire,Si,Ge,and GaAs,etc.



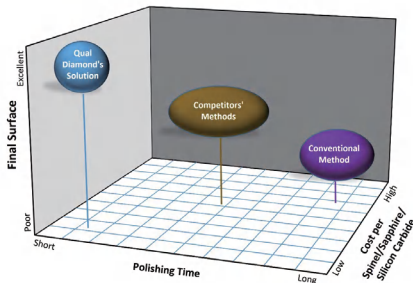


# Hydroqual Diamond Slurry for Advanced Materials

Advanced materials such as synthetic single crystal sapphire, transparent spinel ceramic, and silicon carbide are vital important materials for semiconductor and other industries due to their special properties. Despite all the attractive features of these advanced materials, the high mechanical resistance of these materials makes the polishing process very challenging. Fortunately, Qual Diamond has the innovative solutions to make the process easy. Our advanced diamond slurries are formulated with high-efficiency, tightly sized, surface engineered diamond particles, paired with state-of-art human-health and eco-friendly carriers that facilitate extraordinary surface finish with no sub-surface damage on sapphire, spinel, silicon carbide, ALON optical ceramic, gallium nitride, etc. Our solutions offer exceptionally high removal rates compared to conventional CMP methods. It can turn 8 to 24 hours of sapphire substrate polishing time to 14-40 minutes. Thereby, it largely reduces the processing time and steps. The polished surface is smooth, uniform, and clean without subsurface damage. On top of it, our solutions are much more cost-effective. Finally, it is very easy to use and clean with little training required.

## Benefit:

- ◆ Super high material removal rate (50-200  $\mu\text{m/hr}$ )
- ◆ Significantly shorten polishing time and steps
- ◆ Exceptionally low defectivity with high first-time yield
- ◆ Cost-effective
- ◆ Excellent dispersion, cleanability, and stability
- ◆ Super easy to use and clean-off
- ◆ Biosafe and eco-friendly diamond slurry



## Sapphire:



Before

After

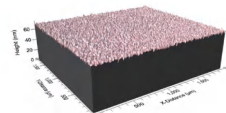
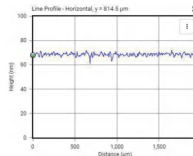
## SiC:



Before

After

## SiC:



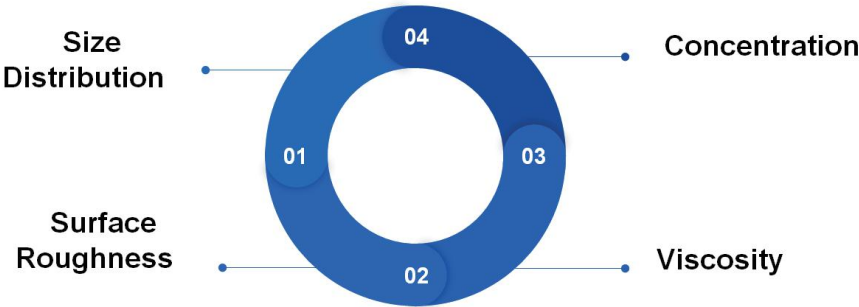
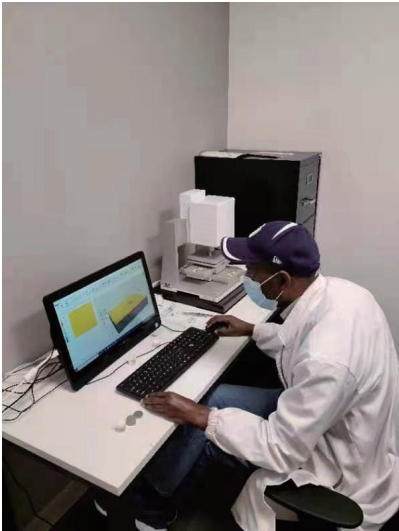
# QUALITY CONTROL

- ◆ Our products are made in the USA
- ◆ We are certified and strictly follow ISO 9001:2015 and ISO 14001:2015 requirements
- ◆ Qual Diamond products pass strict multi-point quality inspection process to ensure our products meet or exceed your expectations. Our multi-point quality process parameters are critical for our products. In all our diamond tools we inspect
- ◆ Tool material composition
- ◆ Qual Diamond manufactures several types of machine tools from alloy steel tools coated with electroplated diamond to advanced PCD and CVD diamond tools. CVD and PCD diamond tools are inspected using our state-of-the-art laboratory cobalt content. The cobalt content is the main factor in very small diameter CVD diamond coated tools flexural toughness
- ◆ Tolerance: Qual Diamond uses strict tolerance measurement standard; we inspect every tool to meet or exceed the tolerance threshold
- ◆ Surface finish is an important quality parameter in diamond tools. The surface finish affects the quality of machining and quality of every end product. We inspect each tools surface finish to eliminate the effects in manufacturing
- ◆ Diamond coating distribution and quality. Diamond coating whether it is CVD coating or electroplated needs consistency and quality diamonds. Qual Diamond inspects all tools for consistent diamond coatings
- ◆ Concentricity is important in cylindrical tools such as drill bits. Qual Diamond inspects each tools concentricity to meet or exceed the set standards





# TAILORED SERVICE





**Qual Diamond**  
Hi-tech Corporation



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