

Engineered Products For Improved Optical Performance

Diamond has an exceptionally high transmission over a very broad range of wavelengths and low scatter in IR applications. Now available in larger area CVD forms, diamond is finding acceptance in ever-wider fields of use. CVD diamond now enables applications demanding higher power, larger area, resistance to hazardous materials or greater strength.

Diamond's exceptional properties provide benefits in a variety applications:

- Low IR absorption
IR Imaging and Analysis
- High Thermal Conductivity for
High Powered Laser Windows
- Low Dielectric Loss for
Microwave Windows

IR Transmission of Optical Grade CVD Diamond Film

IR transmission of optical grade CVD diamond films reach values close to the theoretical limit of 71% at wavelengths in the near and far IR. This low absorption makes CVD diamond an excellent choice for many applications including Nd:YAG laser windows, ATR beam delivery elements, and components in high energy synchrotron beam lines. When hot, corrosive, abrasive, biological or potentially hazardous environments make standard crystals unacceptable, CVD diamond's resistance to mechanical abrasion, biological activity and chemical attack give diamond windows a long useful life. CVD diamond windows are used for both Infrared and Terahertz spectroscopy instrumentation.

Exceptional Properties, Expert Support

Applied Diamond Inc. offers free-standing as well as flange-mounted windows. Material is grown in a variety of sizes and is laser cut and polished to your specific size and geometry requirements. Metalization, polishing and post-processing services are also available.

For More Information Call—302-999-1132



Minimal Distortion in High Power Applications

A common problem for windows used in high-power applications is thermal distortion that occurs as the window is heated by the transmitted beam. CVD diamond has a high thermal conductivity, low absorption and a low temperature coefficient for the refractive index, minimizing the issue of thermal distortion in high power applications. As a result, CVD diamond is used for output windows in giga-watt microwave tubes and CO₂ lasers exceeding 60kW.

Simplified Heat Removal Designs

High quality CVD diamond has both the low loss and the high thermal conductivity to make simple water-cooled window assemblies possible in applications using higher frequency or higher power.

For example, high power gyrotron tubes frequently need complicated cryogenic cooling schemes when equipped with standard window materials. With diamond windows, absorbed energy is quickly dissipated to the edges to be removed by simpler air and water cooling techniques.

Use CVD diamond products for exit windows, output couplers, beamsplitters, thin film or filter carriers, and lenses replacing ZnSe, sapphire and other less stable crystals.