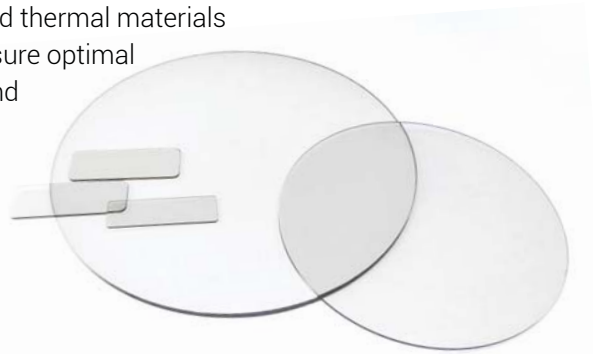


Thermal Grade Polycrystalline CVD Diamond

II-VI Advanced Materials has developed processes to deliver wafers of polycrystalline CVD diamond at diameters of up to 145mm with exceptional thermal properties. With the ability to target a range of thermal conductivities from 1,500 W/mK to more than 2,200 W/mK, II-VI Advanced Materials can meet the needs in the most demanding thermal applications.

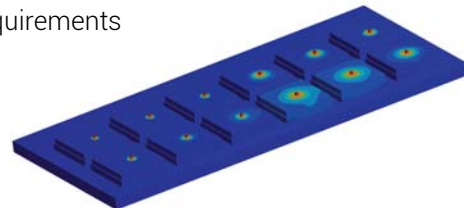
II-VI Advanced Materials has been running production-level diamond growth processes for a world-wide customer base since 2010. We have established high repeatability and reliability in producing diamond materials at even the toughest specifications. We are prepared to handle high volume production requirements for thermal management applications.

Coupling our thermal management growth process with a world-class optical fabrication facility, II-VI Advanced Materials can deliver laser machined, optically polished thermal materials to meet strict bow, warp, and surface roughness specifications to ensure optimal thermal contact to your high powered device. In addition to growth and fabrication, our staff are ready to work with customers through the use of internal metrology such as lamp flash thermal diffusivity measurements and SEM as well as thermal models to engineer application specific solutions.



II-VI Advanced Materials Diamond Thermal Management solutions

- Thermal conductivity tailored to suit both performance and cost requirements
- Custom sizes and shapes for your specific solution
- Optical transparency when needed
- Means to quantify bonding efficacy and stack performance



Our flagship T-2200 Diamond Thermal Management Material couples extraordinary thermal conductivity of better than 2,200 W/mK with high transparency in a wide range of wavelengths (e.g. 1 μ m, 10.6 μ m, IR, Microwave) making it ideal for high power optoelectronic applications. In addition state of the art, high performance optical coatings can be applied to further improve diamond's already superb optical properties.

The T-1500 Diamond Thermal Management Material, with thermal conductivity of better than 1,500 W/mK is an outstanding thermal management solution for a wide array of applications. This high performance material may be used in more price sensitive applications with the same optical finishes from our world-class optical fabrication facility.

Worldwide Technical and Sales Contacts:

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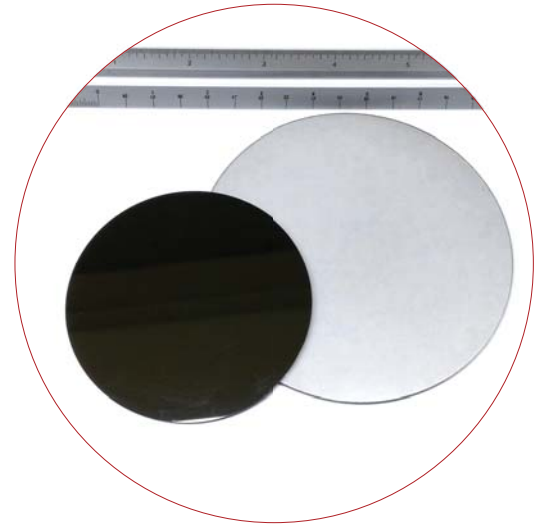
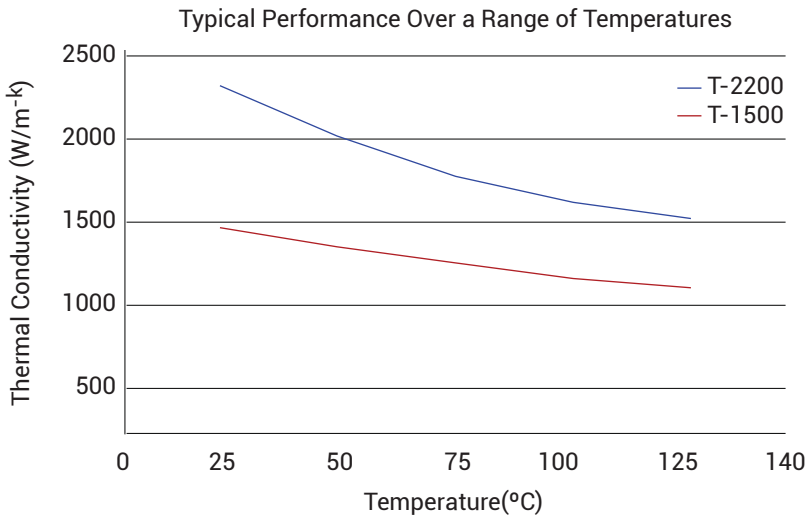
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Thermal Grade Polycrystalline CVD Diamond



Growth Method	Plasma Chemical Vapor Deposition
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Physical Characteristics

Structure	Cubic, Polycrystalline
Grain Size	Thickness and process dependent (0.05 - 1mm)
Grades	T-1500, T-2200
Thickness*	up to 2mm

Fabrication Capability*

Size	Laser-cut to customer specification, maximum diameter 145mm
Dimensional Tolerance	+/- 50µm
Polishing Aspect Ratio	Up to 50:1 for diameters up to 145mm
Bow	4µm/cm
Warp	4µm/cm
Local Thickness Variation	1µm/cm are achievable
Surface Roughness	<15nm

Thermal Properties	T-1500	T-2200
Thermal Conductivity	>1,500 (W/mK)	>2,200 (W/mK)
Thermal Diffusivity	>800 (mm ² /sec)	>1150 (mm ² /sec)
Thermal Expansion Coefficient	1 (10 ⁻⁶ K ⁻¹)	1 (10 ⁻⁶ K ⁻¹)
Specific Heat (25°C)	0.536 (J g ⁻¹ K ⁻¹)	0.536 (J g ⁻¹ K ⁻¹)

*This represents standard tolerances. Performance specifications are available upon request.