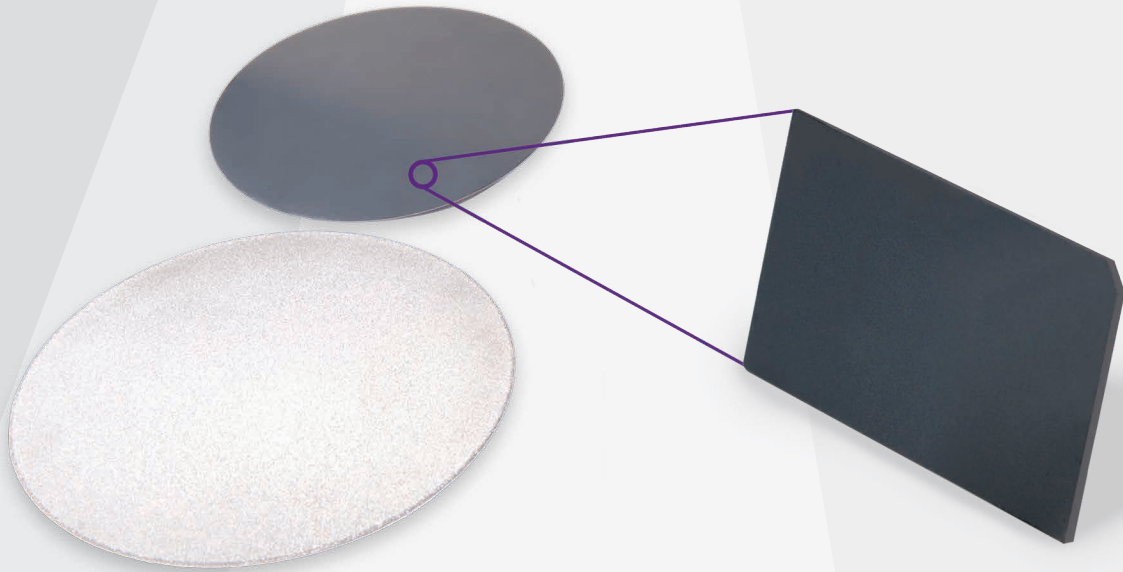


ELECTRONICS

Diafilm™ ETC700



THE HIGHEST THERMAL CONDUCTIVITY MATERIAL IS NOW ALSO ELECTRICALLY CONDUCTIVE

——— *The first electrically conductive CVD diamond heat spreader, Diafilm™ ETC700, delivers the exceptional heat dissipation of diamond combined with minimized resistive and RF losses. Enabling smaller and more reliable high power devices without impeding electrical performance.*

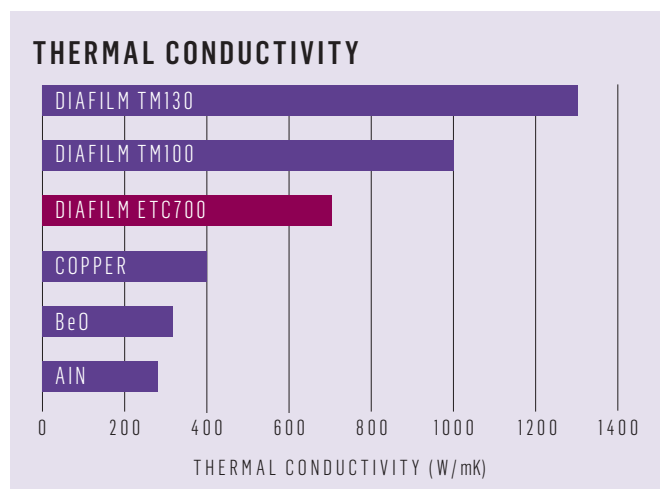
ELECTRICALLY CONDUCTIVE CVD DIAMOND HEAT SPREADERS

Diafilm ETC700 CVD diamond heat spreaders are the first thermal management materials engineered to offer electrical conductivity alongside the exceptional thermal performance of diamond. This unique innovation from Element Six offers low dielectric and resistive losses, making it the ideal material for devices that demand optimal thermal management with minimal impact on electrical RF performance, such as high-power RF, optoelectronics and high-voltage semiconductors.

OUTPERFORMING METAL-COATED SOLUTIONS

Diafilm ETC700 outperforms all other commercially available non-diamond heat spreader materials, such as metallized dielectrics.

- A high conduction cross-section enables better RF performance by improving the ground-plane isolation
- Reduces the slow wave mode and capacitive coupling between ground planes at low frequencies, maintaining a bulk thermal conductivity >650 W/mK
- Reduces conductive losses at higher frequencies



PROPOSED SOLUTIONS TO FIT YOUR APPLICATION

Our engineers and technologists analyze every aspect of the thermal and mechanical properties of a proposed application to recommend a diamond solution of the optimal size, shape and thickness, along with integration advice.

FIND OUT MORE ABOUT DIAFILM ETC700

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DIAFILM ETC700 IS THE LATEST INNOVATION IN THE DIAFILM TM RANGE

Element Six Diafilm TM heat spreaders have the highest known thermal conductivity of any solid material at room temperature. They are proven in the market as an ideal thermal management solution for high-power RF, optoelectronics and high-voltage power semiconductor devices.

ADVANTAGES OF DIAFILM ETC700

- High thermal conductivity
- Electrically conductive
- Excellent for minimizing capacitance coupling
- Offering high conduction cross-section
- Sizes up to 128 mm with a range of thickness and metallization options available
- Broad range of die bonding solutions

PROPERTY	DIAFILM ETC700	DIAFILM TM100	DIAFILM TM130
THERMAL CONDUCTIVITY			
@ 300 K (W/mK)	~700	>1000	>1300
@ 425 K (W/mK)	>500	>900	>1200
RESISTIVITY			
(Ωm)	0.001	10 ¹²	10 ¹²
THERMAL EXPANSION COEFFICIENT			
@ 300 K (ppm/K)	1.0 ± 0.1	1.0 ± 0.1	1.0 ± 0.1
@ 1000 K (ppm/K)	4.4 ± 0.1	4.4 ± 0.1	4.4 ± 0.1
THERMAL DIFFUSIVITY			
@ 300 K (cm ² /s)	>3.9	>5.5	>7.2
SPECIFIC HEAT CAPACITY			
@ 300 K (J/kgK)	520	520	520
VICKERS HARDNESS			
@ 300 K (kg/mm ²)	8000± 1900	8000± 1900	8000± 1900
FRACTURE TOUGHNESS			
(MPam ^{0.5})	5.3 – 7.0	5.3 – 7.0	5.3 – 7.0
YOUNG'S MODULUS			
(GPa)	1000 – 1100	1000 – 1100	1000 – 1100
Poisson's ratio	0.1	0.1	0.1
DENSITY			
(10 ³ kg/m ³)	3.52	3.52	3.52