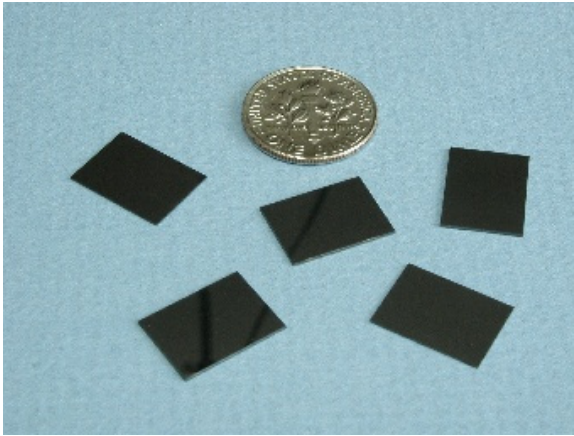




DiaTherm™ Diamond Heat Spreaders



Designed for thermal management applications, *sp3* heat spreaders exhibit exceptionally high thermal diffusivity and conductivity. Typical applications include mountings for laser diodes, laser diode arrays, and high power transistors.

Fabrication

sp3 spreaders are laser-cut from sheets of pure diamond formed by chemical vapor deposition in DC torch reactors.

Characteristics

Chemical composition: 100% polycrystalline diamond (carbon).
 Density: 3.5 g/cm.³
 Electric resistivity: 10¹³ – 10¹⁶ ohms/cm (10¹⁵ ohms/cm typical).
 Thermal conductivity: Up to 1400 W/m°K (1000 – 1200 W/m°K typical).
 Hardness: 1.0 x 10⁴ kg/mm².
 CTE: 1.5 – 1.8 x 10⁻⁶ / °K

Capabilities

Polishing

Surface finish A face: <80 nm R_a.
 Surface finish B face: <5 μm R_a.
 Thickness Tolerance: ± 0.020mm

Laser Cutting

Corner radius tolerances: < 3μm.
 Dimensional accuracy: ±0.050 mm typical.
 Chipout: 20 μm to 50 μm typical. (10 μm minimum)

Standard Sizes

Polished coupons: Up to 25 mm x 25 mm.
 Polished thickness: Between 0.2mm and 1.0 mm.
Special sizes and thicknesses on request.

Polished Segment ¹ Pricing	5mm x 2mm 400 micron	3mm x 3mm 400 micron	5mm x 5mm 400 micron	10mmx 5mm 400 micron
Qty: 10	\$6.15	\$5.75	\$14.50	\$36.00
Qty: 100	\$5.15	\$4.75	\$12.50	\$30.00

(1) Fully polished one side / partial polish opposite side; thickness tolerance +/- 20um; chipout <50um

For more information call 877-773-9940
www.sp3inc.com

sp3 Inc. Company Profile

A brief history

Pioneering development of thin-film tools

sp3 started in Mountain View, CA, in 1993, as a specialist in the development and manufacture of diamond thin-film tools, using proprietary manufacturing processes and sp3-designed CVD reactors. This development effort evolved into the current product line of DIAbide™ tools.

Addition of thick-film diamond tools

In 2000 sp3 acquired the diamond manufacturing facilities of Crystalline Manufacturing Ltd. (CML) of Calgary, Alberta, Canada, now named sp3 Ltd. The acquisition provided sp3 with thick-film polycrystalline diamond manufacturing capability to complement its existing DIAbide thin-film diamond capability. The state-of-the-art facilities include multiple DC torch deposition reactors, and laser cutting, polishing and metrology equipment.

Using both thin-film and thick-film deposition technology, sp3 Diamond Technologies' products include heat spreaders for high power laser diodes, grinding logs, coated silicon wafers to 12" (300mm) diameter, wear surfaces and seals. sp3 Diamond technologies also manufactures CVD deposition reactors and provides diamond deposition consulting services.



Model 600 Diamond Deposition Reactor

- **Computer-controlled deposition**—consistent film thickness and grain size for production; flexible control of deposition for R&D
- **Excellent film uniformity**— $\pm 20\%$ run-to-run, $\pm 10\%$ within a run
- **Large usable deposition area**—144 square inches (93,000 square mm)
- **High production capacity**—example: nine 100mm wafers or one 300mm wafer per run
- **Low cost operation**—less than 0.4 kWh power consumption per cubic mm of diamond deposited
- **Data collection and analysis**—SPC control and links to multiple network protocols for remote monitoring and analysis
- **Safe**—no operator exposure to aromatic hydrocarbons; personnel and equipment protected by hardware and software interlocks
- **Reliable**—MTBF greater than 500 hours
- **Proprietary technology**—protected by U.S. patent no. 5,833,753 and 5,997,650



Corporate headquarters Thin-film and thick-film diamond deposition and segment services

sp3 Inc.

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