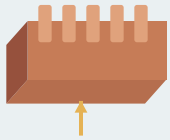


Thermal Management Materials

Bulk heat spreaders | anisotropic sheets | interface materials | semiconductor packaging



Copper

C101 / C110

Heat sinks, cold plates and chip-carrier bases.

k ~390-400 | CTE ~17 | dense, conductive



Aluminum

6061-T6

Lightweight machined plates and finned sinks.

k ~167 | CTE ~23 | easy to CNC

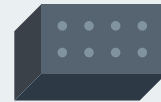


Pyrolytic graphite

PGS / TPG

Thin lateral heat spreading in boards and modules.

k in-plane ~700-1950 | low through-plane



Isostatic graphite

Fine-grain C

Furnace parts, thermal tooling and susceptors.

k ~80-140* | machining dust / particles

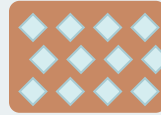


CVD diamond

CVD C

High-flux die, laser and RF heat spreaders.

k ~1000-2200 | costly; bond carefully



Copper-diamond

Cu / diamond

Premium package bases for high-power dies.

k ~450-800* | grade & interface critical



Cu / Mo / Cu

Copper-Mo / Cu-W

CuMo / CuW

Expansion-controlled carriers and heat sinks.

k ~150-250* | lower CTE than pure Cu



Indium foil

In, metal TIM

Compliant, low-resistance sink interfaces.

k ~86 | melts at 156.6°C

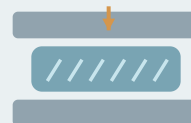


Grease / phase-change

Polymer TIM

Thin interfaces; fills microscopic surface voids.

k ~1-9* | check pump-out & service temp



Gap pads / fillers

Filled polymers

Soft interfaces across larger component gaps.

k ~1-15* | compressibility & outgassing

FAST SELECTION: Machined plates: Cu / Al | Electrical isolation: AlN | Die hot spots: CVD diamond / Cu-diamond

k in W/(m·K), CTE in ppm/K near room temp. *Grade dependent. TIM resistance also depends on thickness and contact.

Sources: Panasonic, SGL Carbon, Element Six, Momentive, Indium Corp, Henkel, Parker and Cu-diamond literature.