TC1050 Composite*

Thermal Management Materials

Momentive Performance Materials has developed a family of thermal management products based upon its high conductivity TPG* (thermal pyrolytic graphite) thermal management materials.

TPG thermal management materials are a unique form of pyrolytic graphite (highly oriented graphene stacks in bulk) manufactured from thermal decomposition of hydrocarbon gas in a high temperature, chemical vapor deposition reactor. TC1050 composite consists of a TPG core encapsulated in various structural materials:

- Aluminum (TC1050.ALY)
- Copper (TC1050.COP)
- Other encapsulations and systems are often available, such as kovar, tungsten/copper, molybdenum/copper, stainless steel, aluminum silicon carbide, carbon fibercomposites, etc.

The thermal expansion properties are defined by the selection of the encapsulating material.

Potential Applications

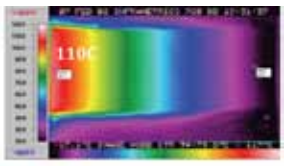
- Heat spreaders in packages
- Thermal cores for PWB's
- Finned sinks
- Laser diode mounts
- Avionics thermal cores
- Satellite traveling wave tube mounts
- Electronic chassis
- Heat sinks for power electronics

Typical Physical Properties (@300K)[1]

PROPERTY	VALUE	MEASUREMENT
Thermal Conductivity	1500 <20	Watts/m-K, a-b axis Watts/m-K, c axis
Density	2.26	gm/cm^3
Thermal Expansion Coefficient	0 to -1 25	ppm/°C, a-b axis ppm/°C, c axis
Specific Heat	0.71	J/gm-°C @ 25°C
Flexural Strength	36.7 38.5	MPa, ab MPa, II ab
Stiffness	1050 36	GPa, c_{11} GPa, c_{33}
Compressive Strength	nil	II ab
Tensile Strength	nil	II ab

[1] Typical data are average and actual results may vary. Typical data shall not be used as product specifications.

6061 Aluminum
45W heater
20° chill block



TC1050 Composite
45W heater
20° chill block

Key Features & Typical Benefits

- Thermal conductivity to 3 times copper
- Lighter than aluminum
- Adjustable coefficients of thermal expansion
- Low thermal resistance
- High reliability from passive conduction
- Sizes from diode mounts to whole chassis panels