



# MOMENTIVE

performance materials

## TC1050<sup>®</sup> Thermal Management Materials

Momentive Performance Materials has developed a family of thermal management products based upon its high conductivity TPG<sup>®</sup> (thermal pyrolytic graphite) material. TPG is a unique form of pyrolytic graphite manufactured from thermal decomposition of hydrocarbon gas in a high temperature, chemical vapor deposition reactor. TC1050 is a macrocomposite 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, carbon fiber composites, etc.

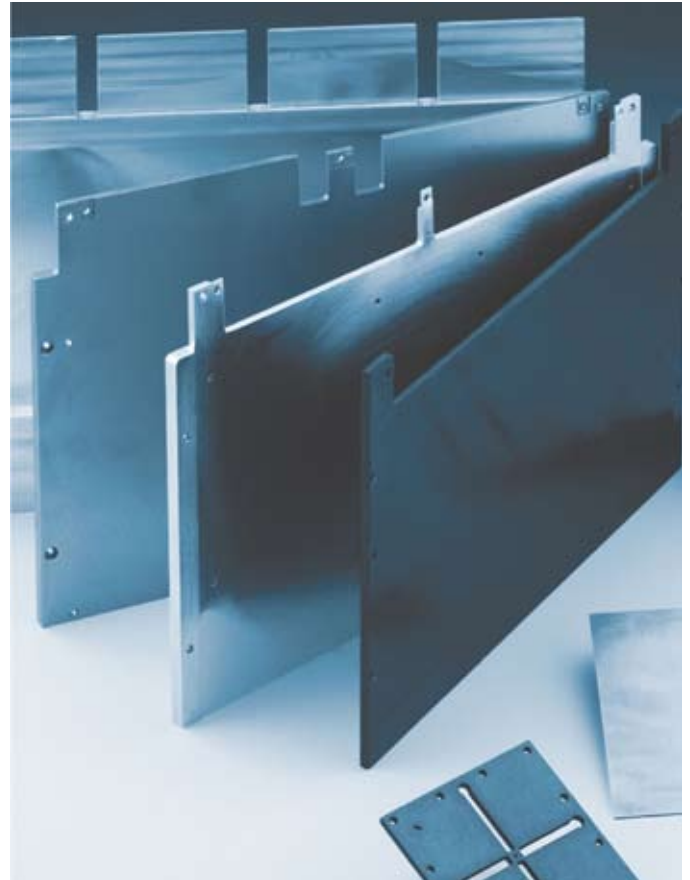
The thermal expansion properties are defined by the selection of the encapsulating material.

### 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

### Applications

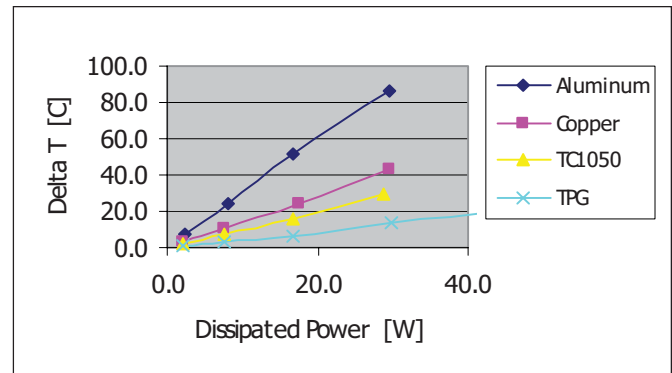
- Heat spreaders in packages
- Thermal cores for PWB's
- Improved performance of finned sinks
- Laser diode mounts
- Avionics thermal cores
- Satellite traveling wave tube mounts
- Electronic chassis



## Typical TPG Properties

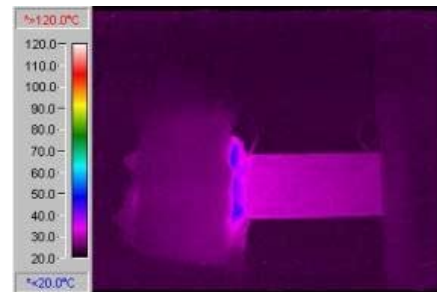
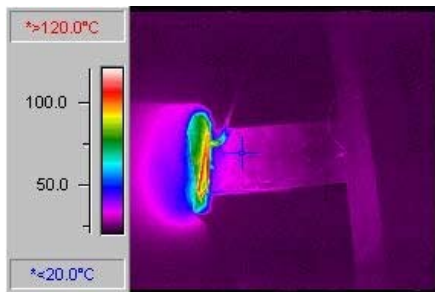
Thermal Conductivity	1500 <20	Watts/m-K, a-b axis Watts/m-K, c axis
Density	2.26	gm/cc
Thermal Expansion Coefficient	0 to -1 25	ppm/°C, a-b axis ppm/°C, c axis
Specific Heat	0.71	J/gm-°C @ 25° C
Flexural Strength	36.7 38.5	+/-4%, MPa, ⊥ ab +/-4%, MPa,    ab
Stiffness	1050 36	+/-2%, GPa, c <sub>11</sub> +/-3%, GPa, c <sub>33</sub>
Compressive Strength	nil	ab
Tensile Strength	nil	ab

## Typical Thermal Performance



TPG shows over 5X the power dissipation capability of Al

## Thermal Images



[www.momentive.com](http://www.momentive.com)

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