

LOCTITE®



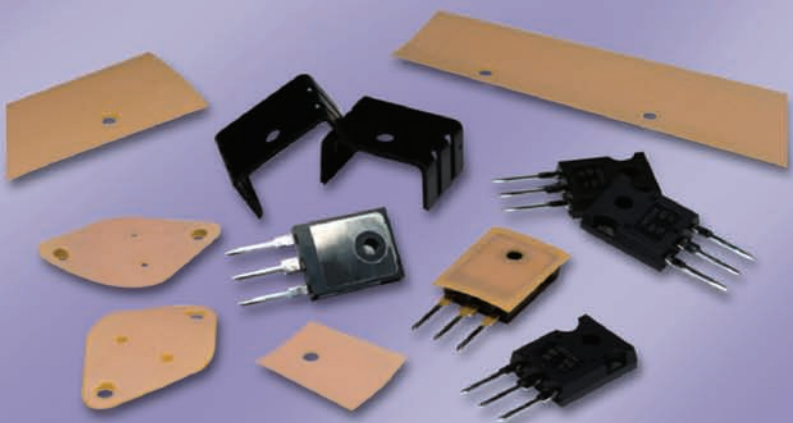
KRAYDEN, INC.

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Loctite® Thermal Management Materials

Thermally Conductive Materials for Maximum Heat Transfer Performance



With the convergence of smaller device footprints and increased functionality, superior thermal management is imperative for long-term product reliability. Henkel has developed an entire suite of Loctite® Phase Change Thermal Interface Materials (PCTIMs) that address emerging heat transfer challenges and deliver exceptional performance.



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Loctite® Phase Change Thermal Interface Material (PCTIM) technology is a unique wax-based system that is solid when cool and liquid once its phase change temperature is achieved. This innovative feature maximizes contact between the heat-generating device and the heat sink through the elimination of air pockets, thus delivering superior thermal characteristics and efficient thermal transfer. Unlike thermal greases or pastes, phase change materials will not migrate or “pump out” of the interface, which ensures many years of excellent thermal performance even in the harshest environments.

Key benefits of the technology include:

- At phase-change temperature, 15% volumetric expansion is achieved and any remaining air gaps are expelled
- Provides 100% surface wetting, which eliminates interfacial thermal resistance
- Supplied in diecut or roll form to speed assembly and reduce manufacturing costs
- Controlled coating thickness encourages consistent thermal performance

Henkel has developed a complete portfolio of Loctite® PCTIMs, formulated for various applications including microprocessors, telecom and RF components, power semiconductors, IGBTs and converters, among others.

Thermally Conductive	Material	Description	Thermal Impedance (°C-in. ² /W) @ 80 PSI	Thermal Impedance (°C-cm ² /W) @ 550 kPa	Thermal Conductivity (W/mK)	Phase Change Temperature (°C)	Volume Resistivity (Ohm-cm)	Dielectric Strength (VAC/mil)	Total Thickness (inches)
	Powerstrate® Xtreme™	Unsupported film with superior thermal performance even at low pressure. Direct attach to heat sink at room temperature without adhesive.	0.003	0.022	3.4	45	N/A	N/A	0.008
	Powerstrate®	Low thermal impedance. Suitable for a wide range of applications on bare die processors and other electronic devices.	0.008	0.052	3	51 or 60	5.9 x 10 ⁶	N/A	.0025-.004
	Thermstrate®	Industry standard phase change preform. Suitable for power IGBTs, semiconductors, DC-DC converters and other electrically isolated packages.	0.022	0.143	1	60	10 ¹²	N/A	.0025-.008
Thermally Conductive, Electrically Isolating	Material	Description	Thermal Impedance (°C-in. ² /W) @ 80 PSI	Thermal Impedance (°C-cm ² /W) @ 550 kPa	Thermal Conductivity (W/mK)	Phase Change Temperature (°C)	Volume Resistivity (Ohm-cm)	Dielectric Strength (VAC/mil)	Total Thickness (inches)
	Isostrate®	Industry standard electrically isolating phase change material.	0.12	0.78	0.45	60	N/A	4500 minimum	.002-.006
	EMI-Strate®	Unique combination of thermal and EMI management. Excellent choice for radiated EMI control .	0.4	2.6	0.69	60	N/A	4500 minimum	See Data Sheet
	Silstrate™ 1.4 (New)	Conformable silicone rubber pad offering high dielectric strength and excellent cut through resistance.	0.316	2.04	1.4	N/A	N/A	900 minimum	0.008
Thermally Conductive, Electrically Conductive	Material	Description	Thermal Impedance (°C-in. ² /W) @ 80 PSI	Thermal Impedance (°C-cm ² /W) @ 550 kPa	Thermal Conductivity (W/mK)	Phase Change Temperature (°C)	Volume Resistivity (Ohm-cm)	Dielectric Strength (VAC/mil)	Total Thickness (inches)
	Silverstrate®	Excellent thermal performance, particularly at higher pressures. Typically used on RF devices and SCRs where electrical conductivity is required. (Silver filled)	0.003	0.022	3.14	51	2	N/A	0.004

**Across the Board,
Around the Globe.**



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