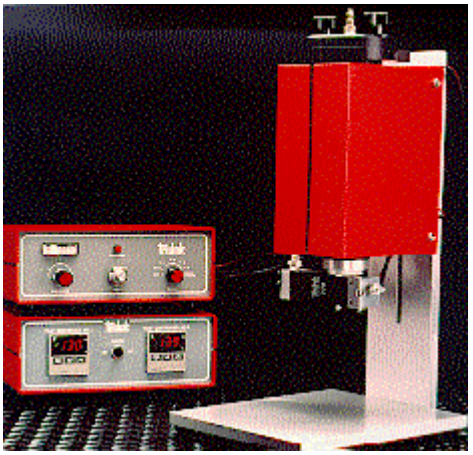
Hot-Melt Thermaphase (98°C)



Advantages:

- Provides fast, easy, inexpensive method for application of Thermaphase material (98°C)
- Fast, automated dispensing of dot, line patterns on individual power components, heat sinks
- Best solution for using Thermaphase in potting, encapsulating, injection molding applications, under fill applications
- Lowest available thermal resistance: 0.05 °C/W/in² at 10psi
- Differential Phase Change allows one or two phase operation
- Controlled sub micron particulate morphology for superior void filling
- Organo-metallic wetting action promotes lamellar flow
- Controlled Thixotropicity eliminates migration
- Thermoplastic Reversible Adhesive Bond (RAD) can eliminate fasteners
- Reversible Adhesive Bond (RAD) characteristic eliminates out gassing
- Environmentally friendly/Non Toxic
- Easy to handle/manufacturing friendly

Description:

This material facilitates applications where die-cut parts or "Thermaps" (Thermal Rod Applicators) can't be used. This hot-melt adhesive material is a solid at room temperature. When heated and dispensed from standard hot melt equipment it can be used to create thermal pads and shaped parts that would not be possible with die-cut parts, or with Rod applicators. Note that per part cost can be very low because you

eliminate the cost of die-cutting and of manual assembly.

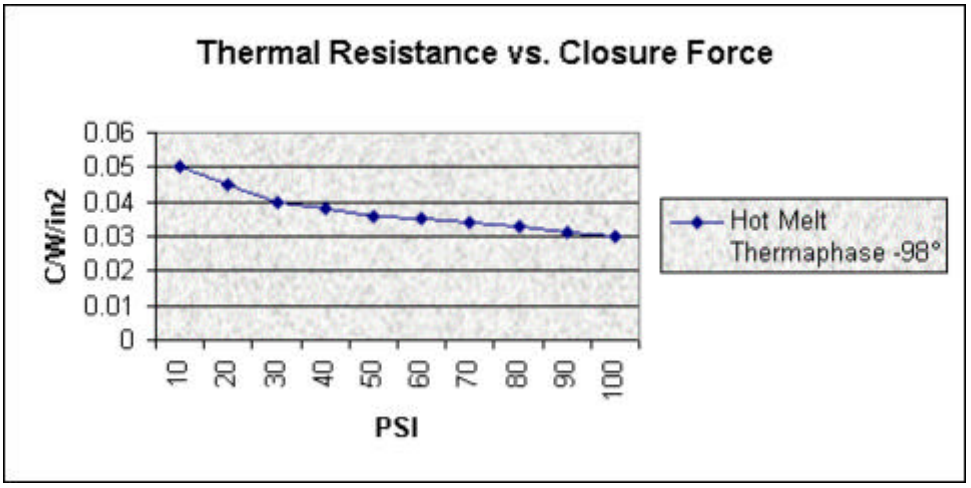
When this material is in a molten state it is thixotropic . By pressing an electronic component into the molten material the thermal compound flow into the micropores of component and heat sink (or PC board), expulsing air from these pores and creating a strong adhesive bond and efficient thermal interface. Excess thermal material is extruded from under the component and forms a "bead" of material around the perimeter of the component. The thinnest possible interface is created. The excess material at the component perimeter forms a seal around the component. Thermaphase Hot-Melt material is not electrically conductive, but it has no barrier in it to prevent metal to metal contact between component and heat sink.

This hot-melt adhesive material is Thermoplastic and exhibits RAB (Reversible Adhesive Bonding). When the material has reflowed under heat and pressure and then recools below the phase change temperature it bonds the component to the heat sink. The component can be removed at any time by reheating. This can be done an unlimited number of times. This product feature can be used to adhere components to heat sinks, replacing mechanical fasteners.

This adhesive hot-melt also finds an important application in adhering folded fins to base plates to form folded fin heat sinks.

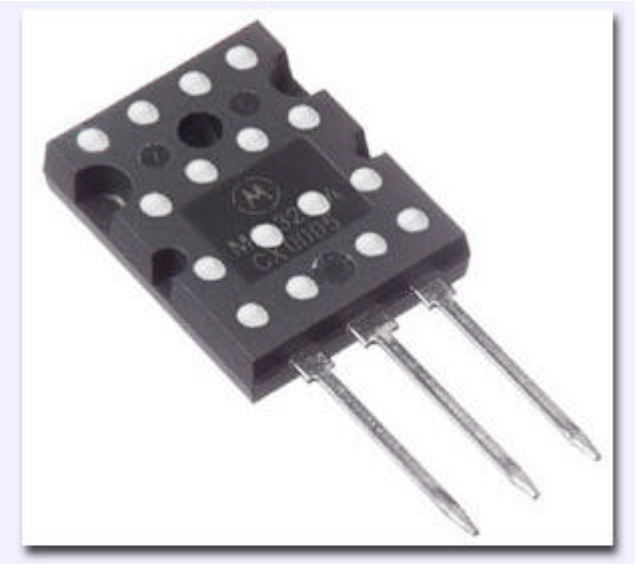
Typical Characteristics:

Thermal Characteristics	**Units**	**Hot-Melt 98°C**
Overall Thermal Resistance at 10.0 psi. See graph of Thermal Resistance vs. Closure Force (See Test Procedure)	°C/W/in^2	0.05 at10psi/0.04 at 30psi
Thermal Conductivity of Thermaphase compound	W/m^2/K	0.63
Phase Change Temperature	°C	98
Use Temperature	°C	-60 to +200
Mechanical Characteristics	**Units**	**Hot-Melt 98°C**
Standard wafers	Pounds (Grams)	1 (454)
Viscosity (Thermaphase compound) at 150°C	Poise	>100
Density of Thermaphase Compound	g/cc	2.1
Electrical Characteristics	**Units**	**Hot-Melt 98°C**
Volume Resistivity*	? -cm	10^{14}
Dielectric Strength	Volts AC	375 per mil
*Note: This material is not electrically conductive but contains nothing to prevent metal to metal contact when a component is pressed onto a heat sink.		



Thermal Resistance versus Closure Force

Important note: These Thermal Resistance tests are in °C/W/in² and were made with standard test apparatus as described in ORCUS Application Note: "Comparative Thermal Tester".



Application Examples:

Apply a dot array or other pattern of Thermaphase to preheated component or heat sink. Immediately press component onto heat sink to flow the Thermaphase Hot-Melt material. Let component/heat sink cool.

Mold Thermaphase to make parts that can have any desired special shape.

Use 98°C hot-melt to attach fins to folded fin heat sinks.

How to Use:

This material can be used in the same way as other hot-melt adhesives. Any standard hot-melt equipment can be used for dispensing the material. Use for joining, potting, encapsulating, creating thermal pad patterns

Product Availability:

Thermaphase Hot-Melt compound is available in standard wafers and blocks for easy melting in hot-melt equipment. For more information go to "Product Availability"