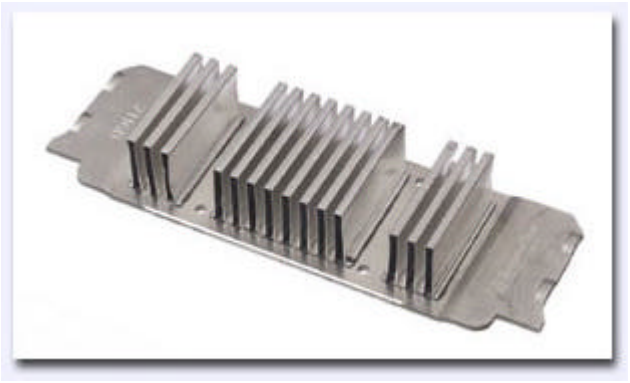
Orcus Datasheets

Thermaphase Free Standing Film FSF-98ºC



Advantages:

- ?? Designed for applications which operate in the solid state
- ?? Very low outgassing for laser diode, space applications
- ?? Low mounting force so you can use clips, not screws
- ?? Differential Phase Change Characteristic allows one or two-phase operation
- ?? Controlled particulate morphology for superior void filling
- ?? Organo-metallic wetting action promotes lamellar flow
- ?? Controlled Thixotropicity eliminates migration
- ?? Thermoplastic adhesion can eliminate fasteners
- ?? Reversible Adhesive Bond (RAB) and 98ºC phase change for elimination of mechanical fasteners
- ?? Use to replace messy, long cure time Epoxies for manufacture of Folded Fin Heatsinks
- ?? Easy to handle - "manufacturing friendly"
- ?? Excellent solvent resistance
- ?? Available in a wide range of thicknesses
- ?? Environmentally friendly/Non Toxic
- ?? Available with Zero ?T adhesive backing

Description:

This product consists of a self-supporting membrane of Thermaphase Phase Change Material. It does not contain a substrate. It is dry-to-the-touch and flexible at room temperature. This is the original Free-Standing-Film material. When placed between two rigid, rough, uneven surfaces and heat (>98°C) and pressure (10.0 psi) are applied the following occurs:

1) When the heat exceeds 98°C (either from electronic component heat-up or because of externally applied heat) the Thermaphase material becomes a soft, thixotropic substance.

2) The physical pressure on the component causes the Thermaphase FSF material to flow into the micropores of the component and heat sink, expulsing air from these pores. The distance from the component to the heat sink decreases as the Thermaphase material enters the pores and surface irregularities. Excess 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.

This material is Thermoplastic and exhibits RAB (reversible adhesive bonding). When the material has reflowed under heat and pressure between component and heat sink and then recools below the phase

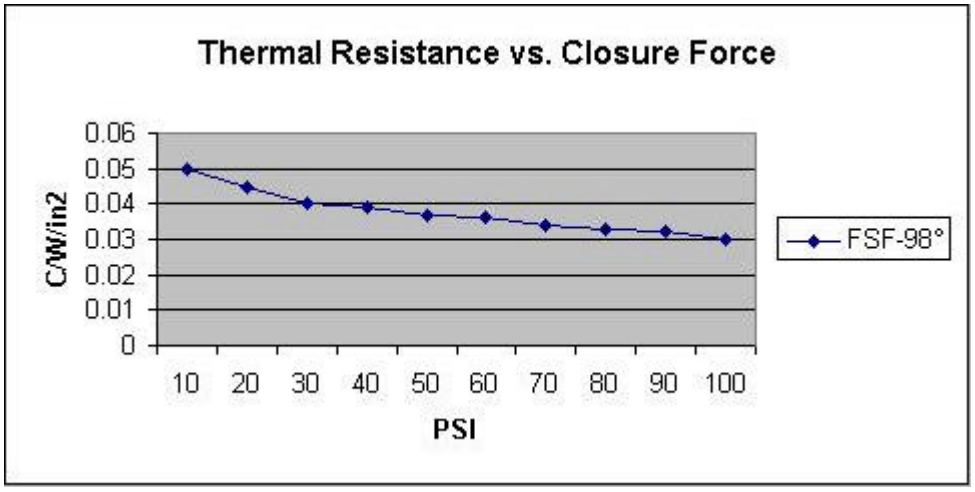
change temperature it adheres the component and heatsink to each other. By reheating the material again beyond its reflow temperature, you can reverse the adhesion and separate the component and heat sink. These process can be carried out an unlimited number of times. This product feature can be used to adhere components to heat sinks to replace mechanical fasteners.

A major application of this Phase Change Material is in any application where you can use external heat to reflow the FSF-98 material. If subsequent component operation is 80°C or less you can adhere your components onto heat sink (or other surface) and eliminate mechanical fasteners.

This material also finds use in many heat storage applications where its high phase change temperature is an advantage.

Typical Characteristics:

Thermal Characteristics	**Units**	**FSF-98**
Overall Thermal Resistance at 10 psi. See graph of Thermal Resistance vs Pressure (See Test Procedure)	C/W/in^2	0.05 at 10psi 0.04 at 30psi
Thermal Conductivity of Thermaphase compound	W/M^2/K	0.63
Phase Change Temperature	Cº	98
Use Temperature	Cº	-60 to +200
Mechanical Characteristics	**Units**	**FSF-98**
Substrate Material	----	None
Material thickness	mils	3 to 50 mils
Viscosity (Thermaphase compound) at 150C	Poise	>100
Density of Thermaphase Compound	g/cc	2.1
Electrical Characteristics	**Units**	**FSF-98**
Volume Resistivity*	? -cm	10^{14}
* FSF-98 is not electrically conductive but contains no substrate to prevent metal to metal contact between component and heat sink.		



Thermal Resistance versus Closure Force

OPTIONS:

Available in thicknesses from 3 to 50 mils thick.

Available with Zero ?T PSA (Pressure Sensitive Adhesive)

How to Use:

Method 1: The FSF membrane is simply placed between component and heatsink. Clips can be used to maintain closure force.
Method 2: The FSF membrane is melted onto and thus adhered to the heatsink or to the component
Method 3: The heat sink and/or component are heated. The component is pressed into the molten FSF and after cooling, the component is adhered to the heat sink.

Product Availability:

Standard Sheets: 12" x 12"

Standard die-cut parts: Pads for all standard case sizes are available. Contact us for outline drawings of standard parts. We have cut thousands of special die-cut parts.

For detailed information on "Specials", we will be pleased to assist you in selecting the material having the best thermal, electrical, and mechanical characteristics.