

Castable Epoxy Heat Sink  
Very High Thermal Conductivity

Technical Bulletin # 3019

**Product Description**

**INSULCAST 147 FR** is an epoxy casting system giving extremely high thermal conductivity. Several hardeners can be used to cure **INSULCAST 147 FR**; however, where thermal conductivity is critical, the hardeners with low ratios should be used to insure highest thermal conductivity. **INSULCAST 147 FR** is U.L. 94V0 recognized for flame retardancy.

**Properties Uncured**

	<b>INSULCAST 147 FR</b>	<b>INSULCURE 9</b>	<b>INSULCURE 11B</b>	
COLOR:	Blue	Amber	Amber	
VISCOSITY, cps:	100,000	50	700	ASTM D 2393
SPECIFIC GRAVITY:	2.75	0.97	0.95	
MIX RATIO (by weight):	100	:1.75	:2.5	
MIXED VISCOSITY @ 60°C, cps:		50,000	50,000	ASTM D 2393
POT LIFE @ 25°C:		1-2 hours	3 hours	
SHELF LIFE @ 25°C, months:	12	12	12	

**Properties Cured**

**PHYSICAL**

HARDNESS, DUROMETER (Shore D):	88	90	ASTM D 2240
FLAMMABILITY UL 94 V-0:	Pass	Pass	
THERMAL CONDUCTIVITY, BTU-in/(ft <sup>2</sup> )(hr)(°F):	30	30	
COEFFICIENT OF THERMAL EXPANSION, °C:	36 x 10 <sup>-6</sup>	36 x 10 <sup>-6</sup>	
HEAT DISTORTION POINT, °C:	80	155	
SERVICE TEMPERATURE, °C:	105	155	

**Electrical**

DIELECTRIC STRENGTH, volts/mil:	410	420	ASTM D 149
DIELECTRIC CONSTANT:	6.9	7.0	ASTM D 150
DISSIPATION FACTOR:	0.015	0.01	ASTM D 150
VOLUME RESISTIVITY, ohm-cm:	1.2 x 10 <sup>15</sup>	1.0 x 10 <sup>15</sup>	ASTM D 257

## Mixing Instructions

1. Pre-heat **INSULCAST 147 FR** to 45-55°C. to lower viscosity. If **Insulcure 9** is used, allow the **147 FR** to cool to 25°C prior to adding **Insulcure 9**.
2. Stir contents thoroughly until all filler is dispersed.
3. Measure out required amount of **INSULCAST 147 FR**. Weigh into it 1.75 parts of **INSULCURE 9** per 100 parts **INSULCAST 147 FR**, or 2.5-3 parts of **INSULCURE 11B** per 100 parts **INSULCAST 147 FR**.
4. Mix thoroughly being sure to scrape sides and bottom of mixing container.
5. Where void-free castings are required, de-gas for 2-5 minutes at 1/2 to 1 cm. Hg.
6. Pour into mold or cavity.

## Cure Schedule

- INSULCURE 9** – Room Temperature Cure - 12-16 hours at 25°C or 2 hours at 65°C.
- INSULCURE 11B** – Fast Cure - 125°C for 2 hours.  
Small Mass - 80°C for 2-3 hours.  
Large Mass (greater than 5 lbs.) - 65°C for 16 hours.

Post cure 2 hours at 150°C for service temperature above 150°C.

## Storage Requirements

This product has a tendency to settle upon shipment or storage. The product should be re-mixed well prior to use. The use of mechanical agitation or drum rollers may be necessary. Store material in a cool dry place.

**Date** 08/2006

### **IMPORTANT:**

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### **HEALTH CAUTION:**

Avoid breathing possible fumes, mists and vapors which can cause severe respiratory damage. Use of NIOSH approved breathing apparatus is required for more than minimal exposure. Always work in areas with adequate ventilation to allow dissipation of polyamine and other chemical fumes, and where applicable, solvent fumes. Use of goggles, protective garments, rubber gloves, protective cream is required. If material gets into eyes, flush thoroughly with clean water for twenty (20) minutes; then seek medical treatment. Avoid skin contact. Material can cause contact dermatitis. Always wash exposed areas immediately, using warm water and soap, followed by rinsing with clean water. Observe all safety precautions. It is important when using solvent based materials or solvents to keep away from open flame or ignition source.

**PLEASE REFER TO MATERIAL SAFETY DATA SHEET FOR FURTHER FIRST AID INFORMATION. FOR CHEMICAL EMERGENCY, CALL CHEMTREC (DAY OR NIGHT) 800 424-9300.**