

# Thermoset™ ME-455 Board Level Encapsulant

## Description

LORD Thermoset™ ME-455 encapsulant is a one-component, semiconductor grade epoxy designed for the encapsulation of wire-bonded or flip chip die in PPGA, BGA, MCM and other cavity packages. It is formulated with high purity resins, fillers and additives to provide the ionic purity levels required for use in high-end microelectronic applications and minimize the chances of ion-induced corrosion in these devices.

Thermoset ME-455 encapsulant offers good adhesion to silicon, laminate, ceramic, solder mask and

metal surfaces. It can be used in demanding high-end, consumer and automotive applications.

## Features and Benefits

**Low Stress** – exhibits low shrinkage and stress on components as it cures.

**Low Coefficient of Thermal Expansion** – minimizes the possibility of cracking during temperature cycling; provides excellent temperature shock performance.

**Fast Cure** – quickly cures at 150°C, leaving no pits or voids for a smooth surface.

**Self-Leveling** – rapidly flows into hard-to-reach spaces.

## Typical Properties\*

### Uncured

Appearance	Black Paste
Viscosity, cps @ 25°C Spindle 14, 10 rpm	14,000-24,000
Specific Gravity	1.69
Gel Time, min @ 150°C	3-5
Working Life, hr @ 25°C	36

### Cured

Volume Resistivity, ohm-cm @ 25°C	$1 \times 10^{15}$
Coefficient of Linear Thermal Expansion, ppm/°C	
alpha 1, by TMA	19
alpha 2, by TMA	60
Glass Transition Temperature (Tg), °C by TMA	135
Hardness Shore D	91-98
Modulus of Elasticity, GPa by DMA	6
Dielectric Constant 1 MHz	3.5
Dissipation Factor 1 MHz	0.008
Extractable Ionic Contaminants, ppm	
Chloride	5
Sodium	5
Potassium	1

\*Data is typical and not to be used for specification purposes.

# LORD TECHNICAL DATA

## Application

**Applying** – Before use on dispensing equipment, allow encapsulant to be warmed to room temperature (ideally 20-25°C). Thaw encapsulant by placing the syringe in a vertical (upright) position with dispense tip facing downward in an ambient environment. Consult handling instructions for specific guidelines.

Mount the syringe onto the dispensing equipment that has been thoroughly cleaned and purge encapsulant through the system until an unbroken flow of encapsulant is extruded. The system is now ready to begin dispensing.

**Curing** – Allow encapsulant to cure for 30 minutes at 150°C. This time-at-temperature profile refers to the time the material should be allowed to cure once it reaches the target temperature. Allowance should be made for oven ramp rates, parts with large thermal mass and other circumstances that may delay material actually reaching the target temperature.

## Shelf Life/Storage

Shelf life is six months from date of manufacture when stored at -40°C in original, unopened container. Syringe must be maintained at -40°C in a vertical (upright) position with the dispense tip facing down. Do not store syringe on its side (horizontally).

This material is shipped and stored frozen. Consult handling instructions for this product for thawing warnings and instructions.

## Cautionary Information

Before using this or any LORD product, refer to the Material Safety Data Sheet (MSDS) and label for safe use and handling instructions.

*For industrial/commercial use only.* Must be applied by trained personnel only. Not to be used in household applications. Not for consumer use.

Values stated in this technical data sheet represent typical values as not all tests are run on each lot of material produced. For formalized product specifications for specific product end uses, contact the Customer Support Center.

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