

Thermoset ES-111 Epoxy Encapsulant

Description

LORD Thermoset ES-111 epoxy encapsulant is a two-component system designed specifically for high voltage, automotive ignition coils, where excellent adhesion to segmented bobbins is critical.

Features and Benefits

Low Viscosity – maintains low viscosity for complete and void-free encapsulation.

Environmentally Resistant – provides excellent resistance to thermal shock.

High Temperature Electrical Performance – developed specifically for electrical stability at high temperature.

Application

Mixing – Preheat Thermoset ES-111 resin to 80-90°C. Preheat Thermoset ES-111 hardener to 30-50°C. Using automatic meter/mix/dispense equipment, mix resin with hardener at a ratio of 100 parts resin to 29 parts hardener, by weight.

Processing – Preheat ignition coils to 90-110°C for 2-3 hours. Using automatic meter/mix/dispense equipment, introduce mixed Thermoset ES-111 encapsulant system into coils under a vacuum of 1-3 torr. Maintain the filled coils at a 1-3 torr vacuum for 10-60 seconds.

Curing – Cure encapsulant using one of the following cure schedules:

- 2.5 hours at 90°C followed by 2.5 hours at 140°C
- 2 hours at 90°C, followed by 2 hours at 110°C, followed by 2 hours at 140°C

In special circumstances where conditions do not permit the use of either cure schedule, alternate curing cycles may be determined by consultation with LORD.

Cleanup – Disposable containers and utensils are recommended when working with epoxies. However, when disposable materials are impractical, uncured encapsulant can be removed by cleaning equipment with solvent. Solvent-cleaned utensils should be thoroughly dried before reuse; any remaining solvent can contaminate the next mixture.

Typical Properties*

	ES-111 Resin	ES-111 Hardener	Mixed
Appearance	Gray, Opaque Paste	Light Yellow, Transparent Liquid	Gray, Thick Liquid
Viscosity, cps	130,000 @ 60°C	100 @ 25°C	8000 @ 25°C
Specific Gravity	1.83	1.20	1.63
Gel Time, min @ 100°C	–	–	70
Working Life, day @ 25°C	–	–	1

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

LORD TECHNICAL DATA

Shelf Life/Storage

Shelf life of Thermoset ES-111 resin and Thermoset ES-111 hardener is twelve months from date of manufacture when stored at 25°C in original, unopened container.

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.

Typical Cured Properties*

Volume Resistivity, ohm-cm @ 25°C ASTM D 257	>1 x 10 ¹⁴
Coefficient of Linear Thermal Expansion, ppm/°C ASTM D 696	
alpha 1	40 x 10 ⁻⁶
alpha 2	129 x 10 ⁻⁶
Glass Transition Temperature, °C by TMA	145
Hardness Shore D, ASTM D 2240	90
Storage Modulus, GPa	2
Dielectric Strength, kV/mm ASTM D 149	30
Dielectric Constant @ 25°C 1 kHz, ASTM D 150	<4
Dissipation Factor, % @ 25°C 1 kHz, ASTM D 150	<0.5

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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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