Thermoset™ UR-312 Urethane Encapsulant

Description

LORD Thermoset™ UR-312 urethane encapsulant is a two-component, low modulus system designed for encapsulation of fragile, pressure-sensitive microelectronic components. Thermoset UR-312 encapsulant cures to a soft, flexible gel using either room temperature or heat cure. Thermoset UR-312 encapsulant is formulated for use at different mix ratios to obtain different cured properties.

Features and Benefits

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

Convenient – offers different properties when used at different mix ratios.

Excellent Adhesion – provides excellent pressure-sensitive adhesion to most substrates.

Environmentally Resistant – provides excellent thermal shock resistance, exhibits exceptional hydrolytic stability.

Broad Temperature Range – can be used on parts and devices that experience operating temperatures from -80°C to +130°C.

Application

Mixing – Thoroughly mix each component prior to combining resin and hardener. Mix Thermoset UR-312 resin with Thermoset UR-312 hardener at the appropriate mix ratio to obtain desired cured properties. Automatic meter/mix/dispense equipment may be used for high volume production.

Unless a closed-chamber mechanical mixer is used, air may be introduced into the encapsulant system either during mixing or when catalyzing the mixture. Electrical properties of the urethane encapsulant are best when air bubbles and voids are minimized. Therefore, in critical applications, vacuuming may be appropriate.

Applying – Apply encapsulant system using handheld cartridges or automatic meter/mix/dispense equipment.

Curing – Initial cure is achieved after 24 hours at room temperature (25°C). Full cure is achieved in 7 days at room temperature, or in 2 hours at 85°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 reaching the target temperature.

Typical Properties* of Resin Mixed with Hardener

	100:50 Mix Ratio	**100:100 Mix Ratio**
Mix Ratio, Resin to Hardener		
by Weight	100:55	100:108
by Volume	100:50	100:100
Viscosity, cps @ 25C	1500	750
Working Life, min @ 25°C	20	20
Cure Time		
days @ 25°C	7	7
hr @ 85°C	2	2

Typical Properties*

	UR-312 Resin	**UR-312 Hardener**
Appearance	Clear Liquid	Clear Liquid
Viscosity, cps @ 25°C	3750	75
Specific Gravity	0.91	0.98

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

Shelf Life/Storage

Shelf life of each component is six months from date of manufacture when stored at 25°C in original, unopened container. After opening, protect each component from exposure to moisture by using dry nitrogen as an inert cover.

If stored or shipped at cooler temperatures, Thermoset UR-312 hardener may crystallize. If crystals appear, gently warm hardener at 32-46°C to melt crystals before mixing with resin. Limit heating period to less than three hours as excessive heating will cause dimerization.

Cautionary Information

Before using this or any LORD product, refer to the Safety Data Sheet (SDS) 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**

	100:50 Mix Ratio	100:100 Mix Ratio
Volume Resistivity, ohm-cm @ 25°C ASTM D 257	1.1 x 10^{16}	2 x 10^{16}
Hardness	50 Shore OO	20 Shore A
Tensile Strength, MPa (psi) @ 25°C ASTM D 638	0.34 (50)	0.69 (100)
Elongation at Break, % ASTM D 638	250	250
Moisture Absorption, % 168 hr @ 25°C	0.29	0.30
Dielectric Constant @ 25°C 1 MHz, ASTM D 150	3.58	3.52
Dissipation Factor @ 25°C 1 MHz, ASTM D 150	0.03	0.02

**Data is typical and not to be used for specification purposes. Cure schedule of 16 hours at 25°C plus 2 hours at 100°C.

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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LORD provides valuable expertise in adhesives and coatings, vibration and motion control, and magnetically responsive technologies. Our people work in collaboration with our customers to help them increase the value of their products. Innovative and responsive in an ever-changing marketplace, we are focused on providing solutions for our customers worldwide.

LORD Corporation
World Headquarters
111 Lord Drive
Cary, NC 27511-7923
USA

Customer Support Center (in United States & Canada)
+1 877 ASK LORD (275 5673)

www.lord.com

For a listing of our worldwide locations, visit LORD.com.