

CoolTherm® SC-104 Thermally Conductive Silicone Encapsulant

Description

LORD CoolTherm® SC-104 thermally conductive silicone encapsulant is a two-component system designed to provide excellent thermal conductivity for electrical/electronic encapsulating applications, while retaining desirable properties associated with silicones. CoolTherm SC-104 encapsulant can be either room temperature cured or heat cured for maximum adhesion.

Features and Benefits

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

Durable – composed of an addition-curing polydimethyl siloxane polymer that will not depolymerize when heated in confined spaces.

Low Viscosity – maintains low viscosity for ease of component encapsulation compared to other highly thermally conductive materials.

Environmentally Resistant – provides excellent thermal shock resistance.

UL Rated – provides excellent flame retardancy; UL 94 V-0 certified.

Application

Mixing – Thoroughly mix each component prior to combining resin and hardener. Mix CoolTherm SC-104 resin with CoolTherm SC-104 hardener at a 1:1 ratio, by weight or volume, until uniform in color. 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 silicone encapsulant are best when air bubbles and voids are minimized. Therefore, in extremely high voltage or other critical applications, vacuuming may be appropriate.

Applying – Apply silicone encapsulant using automatic meter/mix/dispense equipment.

Avoid applying encapsulant to surfaces that contain cure inhibiting ingredients, such as amines, sulfur, or tin salts. If bonding surface is in question, apply a test patch of encapsulant to the surface and allow it to set for the normal cure time.

Typical Properties*

	SC-104 Resin	SC-104 Hardener	Mixed
Appearance	White Liquid	Black Liquid	Gray Liquid
Viscosity, cP @ 25°C	6000	6000	7000
Specific Gravity	2.10	2.10	2.10
Gel Time, min @ 25°C	–	–	60
Working Life, min @ 25°C	–	–	50

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

LORD TECHNICAL DATA

Typical Cured Properties**

Thermal Conductivity, W/m-K Hot Disc Transient Method	0.8
Coefficient of Linear Thermal Expansion, ppm/°C ASTM C 864	160
Hardness Shore A, ASTM D 2240	65
Tensile Strength, MPa (psi) ASTM D 412	3.31 (480)
Elongation at Break, % ASTM D 412-C	45
Moisture Absorption, % ASTM D 570-81	0.1
Volume Resistivity, ohm-cm @ 25°C ASTM D 257	2.2 x 10 ¹⁵
Dielectric Strength, kV/mm (V/mil) ASTM D 149	17.3 (440)
Dielectric Constant @ 25°C 1 MHz, ASTM D 150	3.06
Dissipation Factor @ 25°C 1 MHz, ASTM D 150	0.0075

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Cure schedule of 16 hours at 25°C plus 2 hours at 100°C.

Curing – Allow encapsulant to cure for 24 hours at room temperature (25°C), for 25-30 minutes at 70°C, or for 10-15 minutes at 100°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.

Shelf Life/Storage

Shelf life of each component is nine months when stored at 25°C in original, unopened container. The material must be periodically rotated within its container to maintain maximum shelf life. Settling will occur if not mixed.

CoolTherm SC-104 hardener evolves minute quantities of hydrogen gas. Do not repack or store material in unvented containers. Adequately ventilate work area to prevent the accumulation of gas.

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.

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.

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