

COOLTHERM® SC-303 THERMALLY CONDUCTIVE SILICONE ENCAPSULANT

Technical Data Sheet

CoolTherm® SC-303 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.

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.

Broad Temperature Range: can be used on parts and devices that experience operating temperatures from -40°C to 200°C.

Application

Mixing: Thoroughly mix each component prior to combining resin and hardener. Mix CoolTherm SC-303 resin with CoolTherm SC-303 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 handheld cartridges (only if prepared and used within the same day) or automatic meter/mix/dispense equipment.

Avoid applying CoolTherm SC-303 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.

Curing: Allow encapsulant to cure for 24 hours at room temperature (25°C), or 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.

Typical Properties*

	SC-303 Resin	SC-303 Hardener	Mixed
Appearance	White Paste	Gray Paste	Light Gray Paste
Viscosity, cP @ 25°C	6000	6000	6000
Specific Gravity	2.14	2.14	2.14
Gel Time, minutes @ 25°C	–	–	60-120
Working Life, minutes @ 25°C	–	–	50

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

Typical Cured Properties*

Thermal Conductivity, W/m·K Hot Disc Transient Method, ISO 22007-2	0.9
Coefficient of Linear Thermal Expansion, ppm/°C ASTM D 864	200
Hardness Shore A, ASTM D 2240	45
Tensile Strength, MPa (psi) ASTM D 412	1.17 (170)
Elongation at Break, % ASTM D 412	90
Moisture Absorption, % ASTM D 570-81	0.05
Volume Resistivity, ohm-cm @ 25°C ASTM D 257	3.8×10^{15}
Dielectric Strength, kV/mm (V/mil) ASTM D 149	17.3 (440)
Dielectric Constant @ 25°C 1 MHz @ 25°C, ASTM D 150	4.20
Dissipation Factor @ 25°C 1 MHz @ 25°C, ASTM D 150	0.02

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Shelf Life/Storage

Shelf life of each component is nine months when stored at 25°C in original, unopened container.

CoolTherm SC-303 hardener evolves minute quantities of hydrogen gas. Do not repackage or store material in unvented containers. Adequately ventilate work area to prevent the accumulation of gas.

Cautionary Information

Before using this or any Parker Lord product, refer to the Safety Data Sheet (SDS) and label for safe use and handling instructions.

Verify Volatile Organic Compounds (VOC) requirements with the applicable local, regional and state air quality authorities before importing, selling or using this product. VOC rules, thresholds and reporting obligations vary by jurisdiction; compliance is the responsibility of the importer/seller/owner.

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

Parker Lord
Engineered Materials Group
 111 LORD Drive
 Cary, NC 27511-7923
 USA
 phone +1 877 275-5673
www.parker.com/APS

DS3684 OD 06/26 Rev.8

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