R-2165

Thermally conductive silicone potting elastomer

DESCRIPTION

- Two part, Gray, 1:1 Mix ratio (A:B)
- Pourable and self-leveling
- Cures at room temperature

APPLICATION

- Enhanced thermal conductivity for removal of heat and improved reliability
- Low viscosity allows the potting of complex geometries without the entrapment of air
- Quick set-up and flexible cure schedule
- Applications include: potting for sensors, relays, and other electronic components requiring protection from vibration and generally harsh environmental conditions

PROPERTIES

Typical Properties	Average Result	Standard	NT-TM
Uncured:			
Appearance, Part A	Gray	ASTM D2090	002
Appearance, Part B	Off White	ASTM D2090	002
Appearance, Mixed	Gray	ASTM D2090	002
Viscosity, Part A	4,800 cP	ASTM D1084, D2196	001
Viscosity, Part B	3,200 cP	ASTM D1084, D2196	001
Work Time	10 minute minimum	-	008
Cured: 10 minutes at 150 °C (302 °F)			
Durometer, Type A	60	ASTM D2240	006
Tensile Strength	500 psi (3.4 MPa)	ASTM D412	007
Elongation	100 %	ASTM D412	007
Volume Resistivity*	1.0 x 10^{15} Ohm-cm	ASTM D257	153
Thermal Conductivity	0.50 W/mK	ASTM E1530	101
Dielectric Constant, 100 Hz*	3.6	ASTM D150	906

Typical Properties	Average Result	Standard	NT-TM
Dielectric Constant, 100 kHz*	3.2	ASTM D150	906
Dielectric Strength*	700 Volts/mil (27.3 kV/mm)	ASTM D149	243
Glass Transition Temperature (Tg)*	-48 °C	ASTM E831	-
Coefficient of Thermal Expansion (-140 °C to -70 °C)*	110 µm/m°C	ASTM E831	-
Coefficient of Thermal Expansion (-30 °C to 120 °C)*	230 µm/m°C	ASTM E831	-
Cured: 24 hours minimum at ambient temperature and humidity			
Durometer, Type A	60	ASTM D2240	006
Recommended cure time guidelines at various temperatures**			069
T90 at 80°C	< 2 minutes		
T90 at 100°C	< 0.5 minutes	-	-

*These properties NOT tested on a lot-to-lot basis. Please contact NuSil Technology for assistance and recommendations in establishing particular specifications.
**Recommended cure times are based on the testing performed via ODR (Oscillating Disk Rheometer) where T90 is considered 90% full cure. However the cure times can be affected by multiple factors, including but not limited to, quantity of silicone used, time to heat the entire device or mold, and whether the material is cured in pre-heated oven or not. The cure times listed are not tested on a lot-to-lot basis.

INSTRUCTIONS FOR USE

Mixing and Deaeration

For small or laboratory scale production, NuSil recommends dispensing using side by side kit packaging (i.e. 50 ml cartridge) or mix and meter equipment for larger scale production due to the pot life and the viscosity of the material. If mix meter or dual cartridge equipment are unavailable, R-2165 will require de-airing due to trapped air.

NuSil recommends verification of the work time of the material prior to mixing and observation of all applicable safety precautions. Slowly apply vacuum, up to 28 inches Hg, to a container rated for use and of volume at least four times that of material being deaerated. Apply the vacuum while observing the uncured fluid for presence of bubble formation and increase vacuum slowly enough to avoid rapid foaming. Hold vacuum until presence of air is no longer evident. For more information visit www.nusil.com and review "Mixing and De airing Addition Cure Silicones" in our technical resources.

Substrate Considerations

R-2165 cures in contact with most materials, exceptions include: sulfur-cured organic rubbers, latex, chlorinated rubbers, some RTV silicones and unreacted residues of some curing agents. Epoxies with amine catalysts and solder flux are known to inhibit cures of platinum catalyzed silicones, NuSil recommends taking precaution to minimize contact with said substrates. For more information visit www.nusil.com and review "Avoiding Cure Inhibition" in our technical resources.

Some bonding applications may require the use of a primer. NuSil™ CF2-135 is recommended for most metallic substrates, some plastics and when cure inhibition is observed on substrate. In general, NuSil™ SP-120 is recommended for use with 100% Fluorosilicones. For more information visit www.nusil.com and review "Choosing a Silicone Primer / Adhesive System for Engineering Applications" in the technical resources.

Substrates should be free of dust, oil, and fingerprint soils. Clean substrates using suitable industrial techniques for cleaning devices substrate. If using hydrocarbon solvent cleaning (e.g. acetone, toluene), a final rinse with reagent grade

Packaging

50 ml SxS Kit
200 ml SxS Kit
2 Pint Kit (910 g)
2 Gallon Kit (7.28 kg)
10 Gallon Kit (36.4 kg)

Warranty

6 Months

isopropanol is recommended. If using aqueous detergent cleaning, multiple final rinses with de-ionized water or a single rinse with reagent grade isopropanol is recommended. Adhesion to fluoroplastic substrates is generally poor but may be improved with chemical etching or plasma etching of the substrate.

ROHS AND REACH COMPLIANCE

Please contact NuSil Technology's Regulatory Compliance department with any questions or for further assistance.

SPECIFICATIONS

Do not use the properties shown in this technical profile as a basis for preparing specifications. Please contact NuSil Technology for assistance and recommendations in establishing particular specifications.

WARRANTY INFORMATION

The warranty period provided by NuSil Technology LLC (hereinafter "NuSil Technology") is 6 months from the date of shipment when stored below 40°C in original unopened containers. Unless NuSil Technology provides a specific written warranty of fitness for a particular use, NuSil Technology's sole warranty is that the product will meet NuSil Technology's then current specification. NuSil Technology specifically disclaims all other expressed or implied warranties, including, but not limited to, warranties of merchantability and fitness for use. The exclusive remedy and NuSil Technology's sole liability for breach of warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. NuSil Technology expressly disclaims any liability for incidental or consequential damages.

WARNINGS ABOUT PRODUCT SAFETY

NuSil Technology believes, to the best of its knowledge, that the information and data contained herein are accurate and reliable. The user is responsible to determine the material's suitability and safety of use. NuSil Technology cannot know each application's specific requirements and hereby notifies the user that it has not tested or determined this material's suitability or safety for use in any application. The user is responsible to adequately test and determine the safety and suitability for their application and NuSil Technology makes no warranty concerning fitness for any use or purpose. NuSil Technology has completed no testing to establish safety of use in any medical application.

NuSil Technology has tested this material only to determine if the product meets the applicable specifications. (Please contact NuSil Technology for assistance and recommendations when establishing specifications.) When considering the use of NuSil Technology products in a particular application, review the latest Material Safety Data Sheet and contact NuSil Technology with any questions about product safety information.

Do not use any chemical in a food, drug, cosmetic, or medical application or process until having determined the safety and legality of the use. The user is responsible to meet the requirements of the U.S. Food and Drug Administration (FDA) and any other regulatory agencies. Before handling any other materials mentioned in the text, the user is advised to obtain available product safety information and take the necessary steps to ensure safety of use.

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