

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

Typical Properties	Average Result	Standard	NT-TM
Dielectric Constant, 100 Hz	3.6	ASTM D150	906
Dielectric Constant, 100 kHz	3.2	ASTM D150	906
Dielectric Strength	700 Volts/mil (27.3 kV/mm)	ASTM D149	243
Coefficient of Thermal Expansion			
-140 °C to -70 °C	110 (µm/(m°C))	ASTM E831	-
-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	< 1 minutes		
T90 at 100°C	< 0.5 minutes		

The test data shown for this material is the average value for typical properties. All of these properties may not be tested on a lot to lot basis and cannot be used to draft specifications. Please [contact](#) NuSil® for assistance and recommendations in establishing limits for product 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.avantorsciences.com/nusil and review [Mixing and Deairing Addition Cure Silicones](#).

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.

Packaging

50 ml SxS Kit (0.054 kg)
 200 ml SxS Kit (0.21 kg)
 2 Pint Kit (0.91 kg)
 10 Gallon Kit (36.4 kg)

Warranty

6 Months

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.avantorsciences.com/nusil and review [Avoiding Cure Inhibition](#).

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.avantorsciences.com/nusil and review [Choosing a Silicone Primer / Adhesive System for Engineering Applications](#).

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 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's Regulatory Compliance department with any questions or for further assistance.

SPECIFICATIONS

Do not use the typical properties shown in this technical profile as a basis for preparing specifications. Please [contact](#) NuSil for assistance and recommendations in establishing limits for product specifications.

WARRANTY INFORMATION

The warranty period provided by NuSil Technology LLC is 6 months from the date of shipment when stored below 40°C in original unopened containers. Unless NuSil provides a specific written warranty of fitness for a particular use, NuSil's sole warranty is that the product will meet NuSil's then current specification. NuSil 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'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 expressly disclaims any liability for incidental or consequential damages.

WARNINGS ABOUT PRODUCT SAFETY

NuSil 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 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 makes no warranty concerning fitness for any use or purpose. NuSil has completed no testing to establish safety of use in any medical application.

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