LS1-3252

Optically clear silicone gel

DESCRIPTION

- Two-part, 1:1 Mix Ratio (Part A: Part B)
- 1.52 refractive index for matching BK7
- Cures with heat via addition-cure chemistry and will cure at room temperature

APPLICATION

- For protection of sensitive photonics assemblies from mechanical shock, thermal shock, dust, and ambient atmosphere
- Low viscosity reduces voids in complex assemblies to fill in and permits time for any trapped air bubbles to float to the fluid surface and escape
- For applications requiring optically clear materials with a refractive index of 1.52 at 589 nm
- For LEDs and display assembly

PROPERTIES

Typical Properties	Average Result	Standard	NT-TM
Uncured:			
Appearance	Transparent	ASTM D2090	003
Viscosity (initial Part A and Part B mixed)	360 P	ASTM D1084, D2196	001
Viscosity at 3 hours after catalyzation	< 4,000 cP	-	008
Cured: 30 minutes at 150°C (302°F)			
Durometer, Type 00	25	ASTM D2240	006
Specific Gravity	1.07	ASTM D1217	003
Refractive Index, 589 nm	1.52	ASTM D1218	018
Moisture Absorption, % gain after 168 hour exposure at 85°C (185°F) / 85% R.H.*	<0.2 %	-	202
Cured: 24 hours at ambient temperature and humidity			
Durometer, Type 000	65	ASTM D2240	006
Transmittance vs. Wavelength (25°C)*	See Appendix	-	-

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Typical Properties	Average Result	Standard	NT-TM
Recommended cure time guidelines at various temperatures**			
T90 at 65°C	95 Minutes	-	-
T90 at 85°C	35 Minutes	-	-
Refractive Index vs. Wavelength (25°C)*	See Appendix	-	-
Refractive Index vs. Temperature by Wavelength*	See Appendix	-	-

*These properties NOT tested on a lot-to-lot basis. Please contact NuSil Technology for assistance and recommendations in establishing particular specification

**Recommended cure time 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 Vacuum Deaeration

Thoroughly mix Part A with Part B in a LS1-3252 mix ratio by weight. Remove air entrapped during mixing by common vacuum deaeration procedure. Prior to deaeration, NuSil recommends verification of the work time of the material prior to combining A and B and observe 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

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 Technology 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 Technology's CF2-135 is recommended for most metallic substrates, some plastics and when cure inhibition is observed on substrate. In general, NuSil Technology's SP-120 is recommended for PPA and SP-271 is recommended for PMMA. 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 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

Clean-Up

Remove from surfaces by first wiping off excess uncured material with a suitable, dry, lint-free wipe and then by wiping down the surface with a lint-free wipe soaked with xylene of reagent grade isopropanol. Complete the clean-up process with a final rinse with reagent grade isopropanol. The user is responsible for compliance with all applicable regulations governing disposal of waste materials as indicated in the MSDS. For information on removing cured material please visit www.nusil.com and review Silicone Removal for Electronic Rework Applications in our technical resources.

Packaging	Warranty
50 ml SxS Kit 2 Pint Kit (910 g) 2 Gallon Kit (7.28 kg)	12 Months

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OPERATING TEMPERATURE

The operating temperature range of a silicone in any application is dependent on many variables, including but not limited to: temperature, time of exposure, type of atmosphere, exposure of the material's surface to the atmosphere, and mechanical stress. In addition, a material's physical properties will vary at both the high and low end of the operating temperature range. This type of silicone typically remains flexible at extremely low temperatures and has been known to perform at -50°C (-58°F) as well as resist breakdown at elevated temperatures up to 200°C (392°F). The user is responsible to verify optical and mechanical performance of a material in a specific application.

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 12 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.

PATENT / INTELLECTUAL PROPERTY WARNING

NuSil Technology disclaims any expressed or implied warranty against the infringement of any domestic or international patent/intellectual property right. NuSil Technology does not warrant the use or sale of the products described herein will not infringe the claims of any domestic or international patent/intellectual property right covering the product itself, its use in combination with other products, or its use in the operation of any process.

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APPENDIX

The data represented below is from a limited sample population and is qualitative only. The batch tested was determined to represent the typical procedures and properties of this product. These tests are not performed on a lot to lot basis and are not intended to be used as specifications.

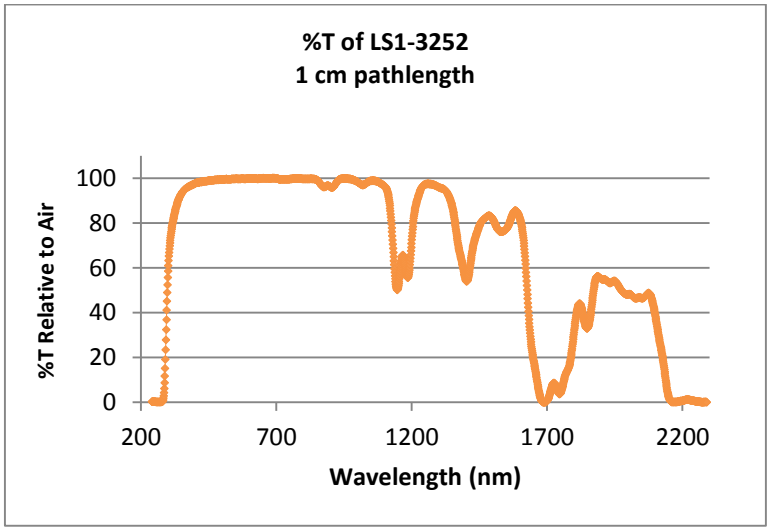


Figure 1. Transmittance Spectrum

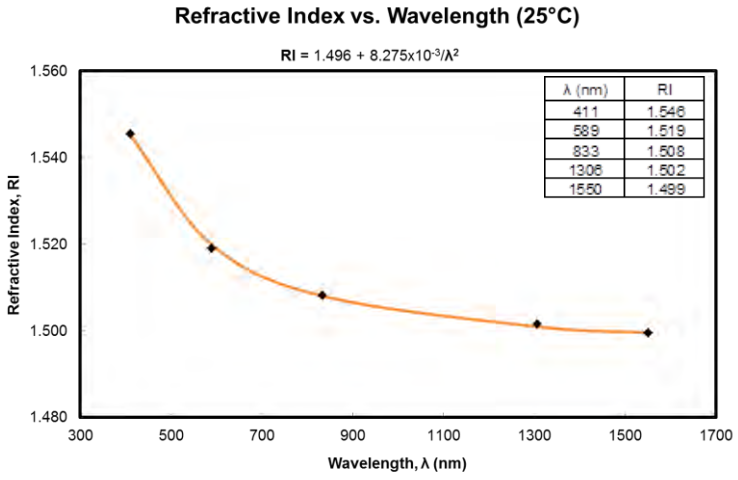
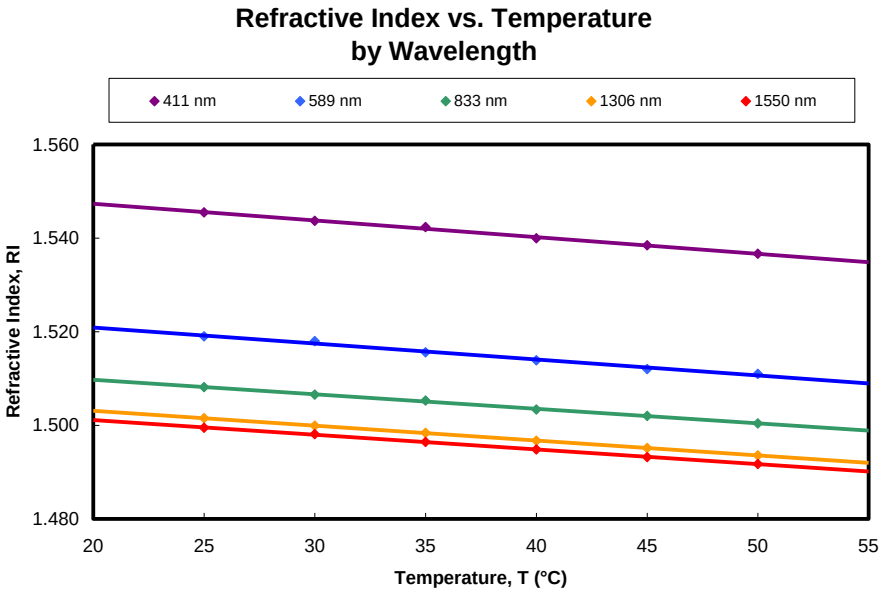


Figure 2. Refractive Index vs. Wavelength, at 25°C

To calculate RI at any given wavelength use Lambda (λ) in micrometers.



$RI_\lambda(T_\lambda)$ Equations
$RI_{411} = -3.562 \times 10^{-4} \times T_{411} + 1.554$
$RI_{589} = -3.411 \times 10^{-4} \times T_{589} + 1.528$
$RI_{833} = -3.099 \times 10^{-4} \times T_{833} + 1.516$
$RI_{1306} = -3.181 \times 10^{-4} \times T_{1306} + 1.509$
$RI_{1550} = -3.142 \times 10^{-4} \times T_{1550} + 1.507$

Figure 3. Refractive Index vs. Temperature, at various wavelengths.

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