GE Silicones

GE Silicone RTV120 Series Neutral Cure Adhesive Sealant

N-SIL® RTV122, RTV123, RTV128
Silicone Modified Alkoxy Adhesive Sealants

Product Description

N-SIL RTV122, RTV123 and RTV128 adhesive sealants are one-component, ready-to-use, and cure to a tough, resilient silicone rubber on exposure to atmospheric moisture at room temperature.

Typical applications include, but are not limited to, sealing vertical joints bonding dissimilar materials such as metal to plastic and glass to aluminium electrical insulation of wires and terminals and formed-in-place gasketing.

The following N-SIL adhesive sealants are identical except for colour:

RTV 122 White
RTV 123 Black
RTV 128 Translucent

Key Performance Properties

- Primer less adhesion to many metals and plastics*.
- Non-corrosive to aluminium and steel per MIL-A-46146A+.
- Lower odour cure than conventional acetoxy silicone sealants.
- UL Recognition. Recognized by Underwriters' Laboratories, Inc. under their Component Recognition Program (UL File No. E-36952). Refer to GE Silicones Tech Info Sheet CDS4320 for additional information.
- One component.
- Cures at room temperature.
- Excellent electrical insulation properties.
- Retains elastomeric properties at temperatures of -60C(-75F) to 204C (400F) for long periods and to 260C (500F) for short periods.
- Excellent weatherability, ozone, and chemical resistance.

* Do not use with polycarbonate. Ammonia and alcohol are by-products of cure. Ammonia may cause crazing of the polycarbonate. + Non-corrosive to aluminium and steel per MIL-A-46146A. Will discolour sensitive metals such as copper and brass when tested per MIL-A-46146A. If you require a sealant that does not discolour copper and brass, suitable sealants are available from GE Silicones. N-SIL is a Registered Trademark of the General Electric Company

Typical Product Data

Typical Uncured Properties	**N-SIL RTV122, RTV123, RTV128**
Colour	RTV122 White RTV123 Black RTV128 Translucent
Consistency	Thixotropic Paste
Specific Gravity	1.04
Application Rate, gm/min 3.2 mm orifice @ 621 kPa(0.125 in orifice @ 90 psi)	500
Tack Free Time, minutes[1]	20
Cure Through Time, hours[1]	24
Typical Cured Properties[(1)] (3 days)	**N-SIL RTV122, RTV123, RTV128**
Mechanical:	
Hardness, Shore A Durometer	30
Tensile Strength, MPa (lb/in^2)	1.72 (250)
Elongation, %	350
Tear Strength, kN/m (lb/in) [(2)]	6.1 (35)
Peel Strength, kN/m (lb/in) [(4)]	7.0 (40)
Electrical: [(2)]	
Dielectric Strength kv/mm (v/mil)	20 (500)
Dielectric Constant @ 60 Hz	2.8
Dissipation Factor @ 60 Hz	0016
Volume Resistivity, ohm-cm	4×10^{15}
Thermal: [(2)]	
Brittle Point, °C (°F)	-60 (-75)
Thermal Conductivity, W/mK ($Btu.hr.ft^2$, °F ft)	0.21 (.12)
Coefficient of Expansion cm/cm °C (in/in, °F)	27×10^{-5} (15×10^{-5})

(1) @ 25C (77F) /50% RH
(2) Information is provided for customer convenience. Their properties are not tested on a routine basis.
(3) Aluminium to stainless steel screen, 25mm.(1 in.) overlap
(4) Using 25mm x 647mm (1in x 8 in.) stainless steel screen at 180° pull angle on Alclad 2024 aluminium.

Specifications

Typical product data values should not be used as specifications. Assistance and specifications are available by contacting GE Silicones at 800/255-8886.

Instructions for Use

Surface Preparation

N-SIL RTV122, RTV123 and RTV128 adhesive sealants display primer less adhesion to many metals, rigid plastics and glass.

Typical values for primer less adhesion for N-SIL RTV128 adhesive sealant include:

	Peel Adhesion* 3 day cure kN/m (lb/in)
Aluminium (Alclad 2024)	7.0 (40)
Cold Rolled Steel	7.0 (40)
Glass	6.1 (35)
Glass Filled Polyester (FRP)	7.9 (45)
Epoxy	7.0 (40)
Rigid PVC	7.0 (40)

* Per ASTM D-903 cured as specified at 25C (77F) /50% RH using 25mm x 647mm (1 in. x 8 in.) stainless steel screen at 180° pull angle.

When adhesion is important, surfaces must be cleaned to remove dirt, oil, and grease and surface contaminants. For metals and glass, suitable solvents such as naphtha, methyl ethyl ketone (MEK), or 1, 1, 1- trichloroethane should be used. For plastics, a cleaning agent that is compatible with the specific plastic should be used. All surfaces should be wiped dry before applying the adhesive sealant.

Due to substrate variability, an evaluation should be made to determine bond strength for each specific application. If adhesion testing shows that a stronger bond is desired, use of a primer is suggested. SS4004, SS4044, and SS4179 primers from GE Silicones are recommended for use with these sealants.

SS4179 primer is recommended for evaluation where a stronger bond is desired on a plastic surface. SS4004 and SS4044 general purpose primers are for non-plastic surfaces. SS4004 and SS4044 primers are identical products, differing only in colour (complete information and usage instructions for these primers are contained in a separate product data sheet).

Application and Cure Time Cycle

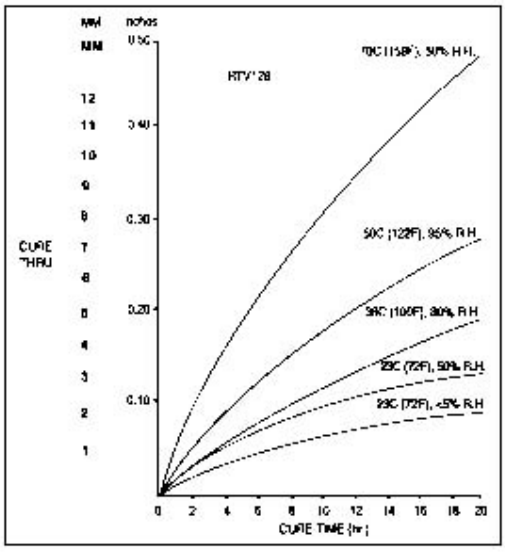
N-SIL RTV122, RTV123 and RTV128 adhesive sealants may be applied directly to clean or primed substrates. Where broad surfaces are to be mated, the sealant should be applied in a thin, less than 6mm (1/4 in.) diameter, bead or ribbon around the edge of the surface to be bonded.

N-SIL adhesive sealants utilize a moisture vapour cure system which releases an alcohol and residual ammonia from the sealant surface during cure.

The cure process begins with the formation of a skin on the exposed surface of the sealant and progresses inward through the material. At 25C (77F) and 50% relative humidity, N-SIL adhesive sealants will form a surface skin that is tack free to the touch in 20 minutes. Once the tack free skin has begun to form, no further tooling of the adhesive sealant is recommended.

Because N-SIL adhesive sealants cure by reacting with atmospheric moisture, high humidity will accelerate the cure process, and low humidity will slow the cure rate. Moderate temperature elevation accompanied by elevated humidity will also accelerate the cure rate as illustrated below:

CURE CHARACTERISTICS VS. TIME**



**Samples spread in 51mm (2 inch) diameter aluminium cups.

Exact cure time will depend on temperature, humidity, sample thickness and sealant configuration. Since cure time increases with thickness, use of these adhesive sealants typically should be limited to section thicknesses of 6mm (1/4 in.) or less. For applications requiring section thicknesses of greater than 6mm (1/4 in.), two component RTV compounds from GE Silicones should be evaluated. Contact GE Silicones technical assistance for applications requiring thicknesses greater than 25mm (1/4 in.)

Physical Property Development

In addition to the effects of temperature and relative humidity, development of maximum bond strength will depend on joint configuration, degree of confinement, sealant thickness and substrate porosity. Normally, sufficient bond strength will develop in 12 to 24 hours to permit handling of parts. Stress should not be applied to the bonded joint until full adhesive strength is developed. Eventually the adhesive strength of the bond will exceed the cohesive strength of the silicone rubber adhesive sealant itself. Always allow maximum cure time available for best results.

After extended time periods at temperatures in excess of 100C (212F), yellowing of RTV122 and RTV128 may be noticed. The yellowing constitutes a colour change only and is not of itself an indication of a loss of elastomeric or electrical properties.

PACKAGING AND DISPENSING

The sealant may be dispensed from caulking cartridges by using hand operated caulking guns or air operated guns. Air operated guns will allow greater control and application speed. Both tubes and cartridges are easy to use, can be put into production quickly and require minimal capital investment.

Note: Do not exceed 310 kPa (45 psi) when using air-powered caulking guns. Bulk containers offer the most economical packaging for volume production.

Bulk delivery systems are air operated extrusion pumps which can be coupled to hand or automatic units.

Refer to CDS1541 “The Sealers Equipment Guide” for further information on dispensing equipment for N-SIL RTV120 series adhesive sealants.

The following are two pump manufacturers that offer equipment for pumping RTV silicone adhesive sealants:

The ARO Corporation	Graco, Inc.
One Aro Center	P.O. Box 1441
Bryan, OH 43506	Minneapolis, MN 55440
419 636-4242	612 623-6743

Additional pump manufacturers and recommendations for pump selection and assistance in converting lines from other silicone cure systems to the N-SIL methoxy cure system are available from GE Silicones.

CLEAN UP AND REMOVAL

Before curing, solvent systems such as naphtha or methyl ethyl ketone (MEK) are most effective.

After cure, solvent systems such as toluene or xylene will swell the RTV silicone sealant and facilitate mechanical removal by scraping.

Handling and Safety

Material Safety Data Sheets are available upon request from GE Silicones. Similar information for solvents and other chemicals used with GE products should be obtained from your suppliers. When solvents are used, proper safety precautions must be observed.

Storage and Warranty Period

The warranty period is 12 months from date of shipment from GE Silicones if stored in the original unopened container at or below 27C (80F).

Availability

N-SIL RTV122, RTV123 and RTV128 adhesive sealants are supplied in ready-to-use 305 mL (10.3 fl. oz.) caulking cartridges, 18.9 L/5 gallon pails (18.1 kg/40 lb), and 208L/55 gallon drums (204 kg/450lb).Products may be ordered from GE Silicones, Waterford, NY 12188, the GE Silicones sales office nearest you or where appropriate, an authorized GE Silicones product distributor.

Government Requirement

Prior to considering use of a GE Silicones product in fulfilling any Government requirement, please contact the Government and Trade Compliance office at 413-448-4624.

CDS4337