

RTV577

Description

RTV511, RTV560 and RTV577 silicone rubber compounds are low temperature two-part silicone elastomers. They are supplied ready to use with a base compound and DBT (dibutyl tin dilaurate) as the standard curing agent. DBT is suitable for most applications, however, other catalysts are available to facilitate deep section cure, faster cure and automated mixing. RTV560 has the widest useful temperature (highest and lowest) of any silicone elastomer.

Key Features and Benefits

- Variable work times and cure rates by adjusting the amount and type of curing agent
- Room temperature cure
- Composition free of solvents and solvent odor
- Excellent adhesion capabilities with primer
- Excellent release properties: Retention of elastomeric properties with the following temperature ranges:
 - RTV511 and RTV577, at temperatures from -115°C (-175°F) up to 204°C (400°F) continuously and up to 260°C (500°F) for short periods of time
 - RTV560 at temperatures from -115°C (-175°F) up to 260°C (500°F) continuously and up to 316°C (600°F) for short periods of time

Typical Physical Properties

| TYPICAL UNCURED PROPERTIES OF RTV BASE COMPOUNDS | RTV511 | RTV560 | RTV577 |
|--|----------|----------|--------|
| Color | White | Red | White |
| Consistency | Pourable | Pourable | Paste |

| | | | |
|--|--------------------------|--------------------------|--------------------------|
| Viscosity, cps | 16,000 | 30,000 | 700,000 |
| Specific Gravity | 1.21 | 1.42 | 1.35 |
| TYPICAL UNCURED PROPERTIES OF RTV BASE COMPOUNDS WITH 0.5% DBT CURING AGENT ADDED | RTV511 | RTV560 | RTV577 |
| Work Time @ 25°C (77°F), hours | 1.5 | 2.25 | 2 |
| Cure Time @ 25°C (77°F), hours | 24 | 24 | 24 |
| TYPICAL CURED PROPERTIES (0.5 wt. % DBT Curing Agent Added, Cured 7 days @ 25°C (77°F) and 50% R.H.) | RTV511 | RTV560 | RTV577 |
| Mechanical | | | |
| Hardness, Shore A Durometer | 42 | 55 | 48 |
| Tensile Strength, kg/cm ² (psi) | 27 (380) | 48 (690) | 31 (440) |
| Elongation, % | 170 | 120 | 150 |
| Tear Strength, kg/cm (lb/in) | 3.8 (21) | 5.5 (31) | 6.8 (38) |
| Shrinkage, % | 1.3 | 1.0 | 0.65 |
| Electrical | | | |
| Dielectric Strength, kv/mm (v/mil) (1.9 mm thick) | 20.5 (520) | 21.2 (540) | 18.5 (470) |
| Dielectric Constant @ 1000 Hz | 3.6 | 3.9 | 3.9 |
| Dissipation Factor @ 1000 Hz | 0.005 | 0.02 | 0.02 |
| Volume Resistivity, ohm-cm | 2 x 10 ¹⁴ | 2 x 10 ¹⁴ | 5.6 x 10 ¹⁴ |
| Thermal | | | |
| Useful Temperature Range, °C (°F) | -115 to 204 | -115 to 260 | -115 to 204 |
| | (-175 to 400) | (175 to 500) | (-175 to 400) |
| Thermal Conductivity, W/M K | 0.26 | 0.31 | 0.31 |
| Coefficient of Linear Thermal Expansion, cm/cm, °C | 22 x 10 ⁻⁵ | 20 x 10 ⁻⁵ | 20 x 10 ⁻⁵ |
| (in/in, °F) | (12 x 10 ⁻⁵) | (11 x 10 ⁻⁵) | (11 x 10 ⁻⁵) |
| Specific Heat, cal/gm, °C | 0.35 | 0.35 | 0.35 |

Processing Recommendations

Mixing

Select a mixing container 4 to 5 times larger than the volume of RTV silicone rubber compound to be used. Weigh out the RTV silicone rubber base compound and add the appropriate amount of curing agent. 0.5% DBT by weight will provide a work time or pot life of 1-2 hours and a cure time of 24 hours. 0.5% DBT is the most commonly used concentration of curing agent for RTV511, RTV560 and RTV577 silicone rubber compounds. The pot life may be lengthened by using less DBT (as little as 0.1%).

Measuring Guide for Curing Agent Addition

| RTV Weight | Dibutyl Tin Dilaurate Concentration | |
|-------------------|-------------------------------------|------------------------|
| | 0.1% | 0.5% |
| 100 grams | 5 drops | 25 drops |
| 454 grams (1 lb.) | 23 drops | 115 drops (2.27 grams) |

Using clean tools, thoroughly mix the RTV base compound and the curing agent, scraping the sides and bottom of the container carefully to produce a homogeneous mixture. When using power mixers, avoid excessive speeds which could entrap large amounts of air or cause overheating of the mixture, resulting in shorter pot life.

Deaeration

Air entrapped during mixing should be removed to eliminate voids in the cured product. Expose the mixed material to a vacuum of 29 inches of mercury minimum (absolute pressure of 25mm). The material will expand, crest, and recede to about the original level as the bubbles break. Degassing is usually complete about two minutes after frothing ceases. When using the RTV silicone rubber compound for potting, a deaeration step may be necessary after pouring to avoid capturing air in complex assemblies.

Curing

Using DBT curing agent at a level of 0.5%, these RTV silicone rubber compounds will cure in 24 hours at 25°C (77°F) and 50% relative humidity to form durable resilient

rubbers. Under these conditions a pot life of 1-2 hours will typically be available for pouring and working with the catalyzed material. Pot life may be increased by refrigerating the mixed material at 0°C (32°F) after catalyzing.

A choice of curing agents is available for use with RTV511, RTV560 and RTV577 silicone rubber compounds.

| Curing Agent | Cure Speed | Curing Agent Concentration | Features |
|--------------|------------|----------------------------|--|
| DBT | moderate | 0.1-0.5% | standard |
| STO | fast | 0.1-0.5% | small volume applications |
| RTV9811 | moderate | 5-10% | good deep section cure suitable for automatic mixing |
| RTV9950 | moderate | 5-10% | suitable for automatic mixing |
| RTV9910 | slow | 5-10% | suitable for automatic mixing |

Deep Section Cure

If these RTV silicone rubber compounds are to be used in deep sections at temperatures over 150°C (302°F), the cured product should be properly conditioned prior to service. Following room temperature cure of 1-3 days, a typical program would be eight hours at 28°C (80°F) intervals from 100°C (212°F) to the service temperature. Longer times at each temperature will be required for larger parts or very deep sections.

Bonding

If adhesion is an important application requirement, RTV511, RTV560 and RTV577 silicone rubber compounds require a primer to bond to non-silicone surfaces. Thoroughly clean the substrate with a non-oily solvent such as naphtha or methyl ethyl ketone (MEK) and let dry. Then apply a uniform thin film of a suitable silicone primer such as SS4004 silicone primer and allow the primer to air dry for one hour or more. Finally, apply freshly catalyzed RTV silicone rubber compound to the primed surface and cure as recommended.

Patent Status

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