Technical Data Sheet

RTV31

Description

RTV31, RTV60 and RTV88 silicone rubber compounds are high 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.

RTV31, RTV60 and RTV88 silicone rubber compounds differ primarily in viscosity in the uncured state.

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 at temperatures from -54°C (-65°F) up to 260°C (500°F) continuously, and up to 316°C (600°F) for short periods of time

Typical Physical Properties

UNCURED PROPERTIES OF RTV BASE COMPOUNDS	RTV31	RTV60	RTV88
Color	Red	Red	Red
Consistency	Pourable		Spreadable Paste

		Pourable	
Viscosity, cps	25,000	47,000	880,000
Specific Gravity	1.42	1.48	1.47
UNCURED PROPERTIES OF RTV BASE WITH 0.5% DBT CURING AGENT ADDED	**RTV31**	**RTV60**	**RTV88**
Work Time @ 25°C (77°F), hrs	2	2	0.75
Cure Time @ 25°C (77°F), hrs	24	24	24
CURED PROPERTIES (0.5 wt. % DBT Curing Agent added, cured 7 days at 25°C (77°F) and 50% R.H.)	RTV31	RTV60	RTV88
Mechanical			
Hardness, Shore A Durometer	54	57	58
Tensile Strength, kg/cm^2 (psi)	61 (870)	70 (990)	59 (830)
Elongation, %	170	120	120
Tear Strength, kg/cm (lb/in)	5 (29)	7 (40)	8 (42)
Shrinkage, %	0.6	0.6	0.6
Electrical			
Dielectric Strength, kv/mm (v/mil) (1.9 mm thick)	17 (430)	17.7 (450)	17.4 (440)
Dielectric Constant @ 1000 Hz	4.4	4	4.3
Dissipation Factor @ 1000 Hz	0.03	0.02	0.03
Volume Resistivity, ohm-cm	1.6×10^{14}	4.4×10^{14}	2.8×10^{14}
Thermal			
Useful Temperature Range,°C (°F)	-54 to 260	-54 to 260	-54 to 260
	(-65 to 500)	(-65 to 500)	(-65 to 500)
Thermal Conductivity (W/m·K)	0.31	0.31	0.31
Coefficient of Expansion, cm/cm, °C (in/in,°F)	20×10^{-5} (11×10^{-5})	20×10^{-5} (11×10^{-5})	20×10^{-5} (11×10^{-5})
Specific Heat, cal/gm,°C (BTU/lb,°F)	0.35 (0.35)	0.35 (0.35)	0.35 (0.35)

Potential Applications

Typical high temperature applications for these products include, but are not limited to:

- Potting and encapsulating electric motors and transformers
- Fabrication of rubber parts
- Casting molds for low-melting point metals
- Release applications such as rubber rollers
- Thermal insulation

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 about one hour and a cure time of 24 hours. 0.5% DBT is the most commonly used concentration of curing agent for RTV31, RTV60 and RTV88 silicone rubber compounds. The pot life may be lengthened by using less DBT (as little as 0.1% DBT).

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)

With 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 25mm (29 in.) of mercury. 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 about one hour 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 RTV31, RTV60 and RTV88 silicone rubber compounds.

CuringAgent	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	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 50°C 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, RTV31, RTV60 and RTV88 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.

General Considerations for Use

While the typical operating temperature for silicone materials ranges from -45℃ to 200℃, the long-term maintenance of its initial properties is dependent upon design related stress considerations, substrate materials, frequency of thermal cycles, and other factors.

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Contact Information
Email
commercial.services@momentive.com

Telephone

Americas	**Latin America**	**EMEAI- Europe, Middle East, Africa & India**	**ASIA PACIFIC**
+1 800 295 2392 Toll free* +704 805 6946 Direct Number	**Brazil** +55 11 4534 9650 Direct Number	**Europe** +390510924300 Direct number	**China** 800 820 0202 Toll free +86 21 3860 4892 Direct number
*All American countries	**Mexico** +52 55 2169 7670 Direct Number	**India, Middle East & Africa** + 91 44 71212207 Direct number* ***All Middle Eastern countries, Africa, India,**	**Japan** +81 3 5544 3111 Direct number **Korea** +82 2 6201 4600

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