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RTV6126-D1; RTV6136-D1; RTV 6156; RTV 6166; RTV 6186; RTV 6196

RTV6100 Series Silicone Dielectric Gels

Product Description

RTV silicone dielectric gels are low viscosity liquid silicones, which cure to form very soft, gel-like elastomers. They are specifically designed to preserve dielectric integrity and provide outstanding protection to delicate electronic circuit assemblies operating in harsh environments. These clear, solventless, two component materials are supplied with curing agents in matched kits which are designed for use at a convenient 1:1 ratio by weight.

When cured, silicone gels possess unique physical properties, combining the self-healing characteristics of a liquid with the non-flowing, dimensional stability of an elastomer. The soft nature and cushioning effect of these semi-solid materials provides excellent protection of electronic assemblies from external shock and vibration. These critical properties are not significantly affected by high and low temperature extremes. This ability, combined with their low modulus properties, makes silicone gels one of the most effective means of managing thermal stress related failures in hybrids and other circuitry utilizing surface mounted devices (SMD's) and other stress sensitive devices.

RTV6126-D1 - An extremely fast curing silicone gel, which offers cure times of less than one hour at room temperature. Due to its very short pot-life, automated meter-mix dispensing equipment is required.

RTV6136-D1 - A "high strength", tough silicone gel, which offers much better tear resistance properties than conventional gels. It also offers cure times of less than four hours at room temperature. Due to its relatively short pot-life, automated meter-mix dispensing equipment is recommended.

RTV6156 - A high performance methyl-phenyl silicone gel specifically formulated to offer extended low temperature performance.

RTV6166 - A general purpose silicone gel offering the excellent performance of a silicone with cost effectiveness.

RTV6186 - A "high strength", tough silicone gel, which offers much better tear resistance properties than conventional gels. It also offers extended room temperature pot-life (8+ hours) for effective use on non-automated production lines.

RTV6196 - A very fast curing silicone gel, which offers cure times of less than two hours at room temperature. Due to its short pot-life, automated meter-mix dispensing equipment is strongly recommended.

Key Performance Properties

- Extremely soft, low modulus elastomeric properties
- Outstanding stress-relief properties
- Mechanical shock/vibration dampening properties
- Primerless adhesion to many substrates
- Excellent dielectric properties
- Excellent moisture protection properties
- Low toxicity, solventless formulation
- Probe testable/self-healing/repairable
- Low viscosity to ensure complete coverage
- Heat accelerated or room temperature cure
- Extended low/high temperature performance
- Low shrinkage, non-exothermic cure
- Optical clarity allows visual inspections

Typical Product Data

Uncured Properties (as catalyzed 1:1 by weight)						
	RTV 6126-D1	RTV 6136-D1	RTV 6156	RTV 6166	RTV 6186	RTV 6196
Appearance	clear, colourless	clear, colourless	clear, colourless	clear, colourless	clear, colourless	clear, colourless
Viscosity, mPa·s (25°C)	750	750	750	750	750	750
Density, g/cm ³	0.98	0.98	0.98	0.98	0.98	0.98
Pot Life (25°C)	5 minutes	30 minutes	1 hour	2 hours	8+ hours	15 minutes
Cured Properties (cured 30 minutes/150°C)						
Physical						
Penetration, mm (25°C)	6.5	6.0	4.0	6.0	6.0	6.0
Useful Temperature Range, °C	-50 to 200	-50 to 200	-115 to 235	-50 to 200	-50 to 200	-50 to 200
Refractive Index	1.41	1.41	1.43	1.41	1.41	1.41
Electrical						
Dielectric Strength, kV/mm@1.9mm	20	20	20	20	20	20
Dielectric Constant (1000 Hz)	2.8	2.8	2.8	2.8	2.8	2.8
Dissipation Factor (1000 Hz)	0.001	0.001	0.001	0.001	0.001	0.001
Volume Resistivity, Ohm-cm	1 X 10 ¹⁵	1 X 10 ¹⁵	1 X 10 ¹⁵	1 X 10 ¹⁵	1 X 10 ¹⁵	1 X 10 ¹⁵

Specifications

Typical product data values should not be used as specifications. Assistance and specifications are available by contacting GE Bayer Silicones Technical Service RTV1 and RTV2.

Instructions for Use

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Compatibility

The RTV6100 series silicone dielectric gels will cure in contact with most clean and dry surfaces. However, certain materials, such as butyl and chlorinated rubber, sulphur-containing materials, amines, and certain metal soap cured RTV silicone rubber compounds can cause cure inhibition. Cure inhibition is characterized by a lack of cure of the silicone gel at the interface between it and the substrate. Compatibility tests should be performed on all materials in contact with the uncured gel, including painted surfaces.

Surface Preparation

The adhesive performance of any polymer system is highly dependent upon proper surface preparation. In order to maximize the adhesion of the RTV6100 series silicone dielectric gels and minimize the potential for cure inhibition, all parts should be as clean and dry as possible prior to the application of the silicone gel. In addition to minimizing the potential for cure inhibition, clean parts also minimize long term reliability problems which can be caused by contaminants trapped under the silicone gel.

Bonding

The RTV6100 series silicone dielectric gels offer excellent, reformable, pressure sensitive adhesion characteristics to a wide variety of substrates without the need of a primer.

For difficult-to-bond-to substrates, or where more aggressive chemical adhesion is desired, the adhesion may be enhanced by using SS4155 silicone primer, available from GE Bayer Silicones. To apply the primer, thoroughly clean the surface and let dry. Then apply a uniform film (0.01-0.02 mm) of SS4155 silicone primer and allow the primer to air-dry for one hour or more. When dry, SS4155 silicone primer exhibits a white haze, which will show through the silicone gel. If the appearance of the surface to be bonded must be unchanged, SS4120 silicone primer, also available from GE Bayer Silicones may be used. For more details on priming and adhesion, please refer to GE Bayer Silicones product data sheet on silicone primers.

Mixing

The RTV6100 series silicone dielectric gels are kit-matched products. As such, work time (pot-life), cure time, and final cured properties can only be assured if the batch numbers on the A component and B component are identical and the material is mixed at a ratio of 1:1 (by weight).

To hand mix, select a clean mixing container 4-5 times larger than the volume of RTV silicone gel to be used. Weigh out equal amounts of the A & B components. With clean tools, thoroughly mix the A & B components together, scraping the sides and bottom of the container carefully to produce a homogeneous mixture. Care should be taken to minimize the amount of air entrapment. Vacuum deaeration (10-20 mbar) can be used to remove entrapped air from the uncured mixture.

Due to their extremely short work life, mixing of RTV6126-D1, RTV6136-D1 and RTV6196 for use in continuous or high volume production environments should be done via automated meter/static-mix dispensing equipment. The use of dynamic mixing equipment or hand-mixing is not recommended.

The final cured properties of the RTV6100 series silicone dielectric gels can be altered by changing the mix ratio of the two components. Increasing the ratio of Part A to Part B will yield a softer gel (i.e. higher penetration value). Likewise, decreasing the ratio of Part A to Part B will result in a gel with a lower penetration value. Deviations greater than 10% from the standard 1:1 mix ratio are not recommended. Changes to the mix ratio will affect the pot-life of the catalyzed mixture.

Pot-Life and Cure Time Comparisons

Product	Pot-life	Cure Time (1:1) Mix Ratio			
	25°C	25°C	65°C	100°C	150°C
RTV6126-D1	5 mins	< 1 hr	20 mins	5 mins	2 mins
RTV6196	15 mins	< 2 hrs	1 hr	10 mins	5 mins
RTV6136-D1	30 mins	< 4 hrs	2 hrs	20 mins	10 mins
RTV6156	1 hr	< 18 hrs	4 hrs	1 hr	15 mins
RTV6166	2 hrs	< 24 hrs	4 hrs	1 hr	15 mins
RTV6186	8+ hrs	N/A*	4 hrs	1 hr	15 mins

*Requires minimum cure temperature of 60°C

When used, ovens must be well ventilated.

CURE TIMES ARE ONLY APPROXIMATE. THE ACTUAL TIME IS AFFECTED BY THE MASS OF THE GEL AND THE TIME REQUIRED TO REACH THE DESIRED TEMPERATURE.

Handling and Safety

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

CAUTION

The curing agent ("B" component) of the RTV6100 series dielectric silicone gels can generate flammable hydrogen gas upon contact with acidic, basic, or oxidizing materials. Such contact should be avoided.

Storage and Warranty Period

The warranted shelf life will be indicated by the 'use before date' on the associated documents with a minimum of 4 months when stored in the original unopened containers below 25° C.

Availability

The RTV6100 series dielectric silicone gels are available as matched kits only:

RTV6126-D1 is available as 900 g kit, 8.2 kg kit and 363 kg kit.

RTV6136-D1 is available as 36.3 kg kit and 363 kg kit.

RTV6156 is available as 900 g kit and 36.3 kg kit.

RTV6166 is available as 900 g kit, 8.2 kg kit, 36.3 kg kit and 363 kg kit.

RTV6186 is available as 900 g kit and 36.3 kg kit.

RTV6196 is available as 36.3 kg kit and 363 kg kit.

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