

# RTV133

*Black, Flame Retardant, One Component Silicone Sealant*

## Product Description

RTV 133 black, one-component, ready-to-use, silicone rubber adhesive sealant is recommended for evaluation in applications in the electronic, aerospace, appliance, transportation and other industries where resistance to burning of the finished product is a significant design consideration. On exposure to moisture in the air at room temperature, this adhesive sealant cures to a tough, durable, resilient silicone rubber. It utilizes a moisture vapour cure system, which releases an alcohol vapour from the sealant surface during cure. RTV133 sealant offers low odour cure with no unpleasant smell or pungent cure by-products. It is, however, somewhat slower curing both in tack-free time and cure-through time than moisture vapour cure silicone adhesive sealants which give off acetic acid vapours as a cure by-product.

Because RTV 133 sealant has a paste-like consistency and will flow only with external pressure, it is suitable for use on horizontal, vertical and overhead surfaces in thicknesses to 6mm. It has sufficient uncured body to adhere to small objects while cure is taking place. For applications requiring sealant thickness greater than 6mm, GE Bayer Silicones one-component, addition cure or two-component silicone rubber compounds with similar properties are available.

## Key Performance Properties

- Thixotropic paste consistency
- Low flammability—has a UL rating of V-0 or V-1 using UL-94 test
- Capability to cure at room temperature and ambient humidity conditions
- Resistance to high temperatures
- Low temperature flexibility
- Excellent weatherability and ozone and chemical resistance
- Excellent electrical insulation properties
- Non-halogen flame retardant

## Typical Product Data

Typical Uncured Properties	
Colour	black
Consistency	soft, spreadable paste
Density, g/cm <sup>3</sup>	1.23
Application Rate, g/min.	650
Tack-Free Time, hours	1
Typical Cured Properties	
<b>Mechanical:</b>	
Hardness, Shore A	45
Tensile Strength, MPa	4.6
Elongation, %	250
Shear Strength, MPa <sup>(1)</sup>	1.2
Flammability (UL94). 3.38mm thick <sup>(2)</sup>	V-0

<b>Electrical:</b> <sup>(3)</sup>	
Dielectric Strength, kV/mm	20
Dielectric Constant @ 100 Hz	2.8
Dissipation Factor @ 100 Hz	0.001
Volume Resistivity, ohm-cm	3x10 <sup>15</sup>
<b>Thermal:</b> <sup>(3)</sup>	
Brittle Point, °C	< -60
Thermal Conductivity, W/m.K	0.21
Coefficient of Expansion, cm/cm, °C	< 27x10 <sup>-5</sup>

(1) At 100% cohesive failure.

(2) This numerical flame spread rating is not intended to reflect hazards presented by this or any other material under actual fire conditions.

(3) Information is provided for customer convenience only. Properties are not tested on a routine basis.

## 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.

### FLAMMABILITY

2)Underwriters Laboratories Inc., Standard 94 describes a vertical burning test to be performed under laboratory conditions. In this test specimens are placed in the flame of a laboratory burner, and the ability of the substance to sustain a flame over a specified period of time upon removal of the source of the flame is determined. When tested by this procedure in the GE Silicones laboratory, RTV133 sealant has exhibited burning characteristics for a classification of 94V-O. Potential users of RTV133 sealant should refer to UL-94 for details of the test and the classification limits.

Each potential user should determine for himself/herself whether this test procedure is meaningful for his particular application and should run independent tests to determine whether RTV133 sealant is suitable for such particular application.

The above test, claims, representations and descriptions regarding the flammability of the product described are based on a standard small scale laboratory test and as such are not reliable for determining, evaluating, predicting or describing the flammability or burning characteristics of this product under actual fire conditions, whether this product is used alone or in combination with other products.

### UL STATUS

RTV133 adhesive sealant is recognized by Underwriters Laboratories, Inc. under the Component Recognition Program (UL File No. E36952).

### FDA STATUS

This product is not suitable for FDA regulated applications.

### PATENTS

The product RTV133 is within the scope of Patent 4,102,852.

## Instructions for Use

### Applications

RTV 133 silicone rubber adhesive sealant should be considered for industrial applications where reduced flammability characteristics of the finished product are important.

Typical applications include coatings for electronic and integrated circuits and semi-conductors and connections on electronic parts assemblies. Because of the low odour of its cure by-product, RTV 133 sealant is also suitable for mechanical applications in confined work areas where the odor of other moisture vapour cure sealants might be objectionable.

### **Surface Preparation**

RTV133 silicone rubber adhesive sealant will bond to many clean surfaces without the aid of a primer. These surfaces normally include many metals, glass, ceramic, silicone rubber and some rigid plastics. The adhesive sealant product will also produce fair bonds to some organic rubber and flexible plastics not containing fugitive plasticizers (which migrate to the surface impairing adhesion). An evaluation should be made to determine bond strength for each specific application. For difficult-to-bond substrates, use of a primer is suggested. SS4004P, SS4044P and SS4179 primers are recommended for use with this sealant.

Where adhesion is required, surfaces should be thoroughly cleaned with a suitable solvent to remove dirt, oil and grease. The surface should be dry before applying the adhesive sealant. When solvents are used, proper safety precautions must be observed.

### **Cure Time Cycle**

RTV133 adhesive sealant may be applied directly to a clean or primed substrate. The adhesive sealant begins to cure on exposure to moisture in the air at room temperature. Where broad surfaces are to be mated, the sealant should be applied in a thin, less than 6mm diameter, bead or ribbon around the edge of the surface to be bonded.

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 and 50% relative humidity, this product will form a surface skin which is tack-free to the touch in 3 to 5 hours. Once the tack-free skin has begun to form, further tooling of the adhesive sealant is not advisable.

Higher temperatures and high humidity will accelerate the cure process low temperatures and low humidity will slow the cure rate. As the adhesive sealant cures, alcohol vapours are released from the sealant surface. This by-product of cure has a slight, but non-objectionable odour which will diminish as the cure progresses. A 3mm section of adhesive sealant will cure through in approximately 48 hours at 25C and 50% relative humidity. Since cure time increases with thickness, use of RTV 133 sealant should be limited to section thicknesses of 6mm or less.

### **Bond Strength 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 24 to 48 hours to permit handling of parts. Minimum stress should be applied to the adhesive bond until full adhesive strength is developed. Always allow maximum cure time available for best results.

### **PACKAGING AND DISPENSING**

RTV 133 adhesive sealant is supplied ready-to-use in plastic caulking cartridges and in bulk containers.

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

**Note:** Do not exceed 3 bar when used in air-powered caulking guns. Bulk containers require a larger initial investment in dispensing equipment, but offer the most economical packaging for volume production. Bulk dispensing systems are air-operated extrusion pumps coupled to hand or automated dispensing units. Pumps which are specifically designed for pumping one-component RTV silicone rubber have TEFLON® seals, gaskets and TEFLON® lined hoses to prevent moisture permeation and pump cure problems.

## **CLEAN UP AND REMOVAL**

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

After cure, selected chemical strippers which will remove the silicone rubber are available from other manufacturers. Specific product information may be obtained on request.

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### **Handling and Safety**

RTV133 sealant is manufactured and sold for industrial use only. 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.

### **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 10° C.

### **Availability**

RTV133 is available in 204 kg drums, 20.4 kg pails and 310 ml cartridges.

## **LEGAL DISCLAIMER**

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