Product Information

DOW CORNING

Liquid Silicone Rubbers

Silastic® D94-45M Liquid Silicone Rubber

FEATURES

- Noncorrosive
- Low odor
- Unprimed adhesion

COMPOSITION

- Two-part, heat-cure, liquid silicone rubber

A two-part, nonslumping, heat-cure liquid silicone rubber elastomer designed to be easily mixed, dispensed, and cured directly on automotive and other industrial components to form a compression gasket.

APPLICATIONS

- Sealing engine valve covers, cam covers, front covers, and oil pans, as well as other automotive and industrial components

DESCRIPTION

Dow Corning® D94-45M Liquid Silicone Rubber is a two-part, nonslumping, heat-cure silicone elastomer designed to be easily mixed, dispensed, and cured directly on automotive and other industrial components to form a compression gasket. It is resistant to engine oils, water/glycol mixtures, and many other automotive and industrial fluids with the exception of fuels and solvents.

Dow Corning D94-45M Liquid Silicone Rubber, mixed in a 1:1 ratio, exhibits excellent unprimed adhesion to a variety of plastic and metal substrates. For these substrates, the gasket will not become loose during shipping and handling, assembly, or operation.

The cured-in-place gasket (CIPG) concept made possible with *Dow Corning* D94-45M Liquid Silicone Rubber provides a successful alternative to traditional gasketing methods using manually installed preformed gaskets. The CIPG approach provides increased design flexibility, as the gaskets can be dispensed on complex parts. The gasket can be changed simply by reprogramming the dispensing system.

The dispensed gaskets are applied and positioned in a reproducible fashion, ensuring good sealing performance. The dispensing/curing process lends itself ideally to a continuous, fully automatic, cost-effective operation.

Typical properties are shown inside.

HOW TO USE

Substrate Preparation

Adhesion is important to ensure the gasket stays where it belongs. Therefore, you need to keep a few things in mind.

First, this product bonds better to some substrates than others. For instance, metals typically are easier to adhere to than plastics, and some low-surface-energy plastics such as polyethylene and polypropylene are very difficult to bond to.

Regardless of the substrate, it must be clean for best adhesion. This means no dirt, oils, release agents, dust, or shavings. To clean the substrate, it may be necessary to wash the part prior to applying the gasket material. Keep in mind that not all washing techniques achieve the same results. Certain cleaning

solutions can leave a residue that may actually hamper adhesion, so be sure to test your washing process thoroughly.

Finally, some substrates—even when properly washed—will require additional treatment to achieve good adhesion. This could mean plasma, corona, or flame treatment; chemical priming; or, in some cases, both. If you think your application will require surface treatment, contact your Dow Corning representative for more information.

Metering/Mixing

Dow Corning D94-45M Liquid Silicone Rubber should be metered using a positive displacement device, such as a gear pump, and mixed using static or dynamic mixing. For information on suitable metering and mixing equipment, contact Dow Corning.

Dispensing

Apply the product to the prepared surface in a continuous, uniform thickness. *Dow Corning* D94-45M Liquid Silicone Rubber should be dispensed using a suitable robot, XYZ table, or other motion device to obtain a uniform seal.

The gasket bead size to be specified is a function of the anticipated gap size for the part and the flange width. Consult your Dow Corning representative for design recommendations.

Working Time

Dow Corning D94-45M Liquid Silicone Rubber has a working time of about 8 hours at 23°C (73°F). Higher temperatures will reduce working time.

TYPICAL PROPERTIES[1]

Specification Writers: Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Test		Unit	Result
As Supplied[1]:			
CTM[2] 0176	Consistency		Paste
CTM 0063	Color		
	part A		Black
	part B		Off-white
CTM 0364	Extrusion Rate, 3.2-mm (1/8-inch) nozzle at 0.63 MPa (90 psi)		
	part A	grams/minute	74
	part B	grams/minute	74
As Mixed-1:1 Ratio			
CTM 0063	Color		Black
CTM 0097	Specific Gravity		1.22
As Cured-Physical[3]			
ASTM D 2240	Durometer, Shore A	points	45
ASTM D 412	Tensile Strength, Die C	MPa (psi)	6.9 (1000)
ASTM D 412	Elongation, Die C	%	580
ASTM D 412	Modulus, at 100% elongation, Die C	MPa (psi)	1.3 (193)
ASTM D 624	Tear Strength, Die B	kN/m (ppi)	44 (250)
ASTM D 395	Compression Set, 22 hours at 177°C (351°F)	%	30
CTM 0087	Volatility	%	1
ASTM D 816	Lap Shear Adhesion,[4] 12.7 x 25.4 x 1 mm (0.5 x 1 x 0.040 inch), aluminum substrate	MPa (psi)	1.4 (200)
As Cured—Heat Aged			
Atmosphere, 168 hours at 150°C (302°F),			
	change in durometer	points	5
	change in tensile	%	-2
	change in elongation	%	-15
	change in modulus, at 100% elongation		35

[1]Tested at 23°C (73°F) and 50% relative humidity.

[2]Corporate Test Method. Methodology is available from your Dow Corning representative.

[3]After curing 5 minutes at 150°C (302°F).

[4]After curing 30 minutes at 150°C (302°F) in an aluminum fixture.

Cure

When properly mixed, a bead of *Dow Corning* D94-45M Liquid Silicone Rubber on a typical component will cure in five to eight minutes at 150°C (302°F). This heat can be developed with a traditional convection oven or an infrared oven. Typically, the portion of the part directly underneath the bead will be the last section to reach temperature. This area should be at 150°C (302°F) before the part leaves the oven.

Cure Inhibition

Certain materials, chemicals, curing agents, and plasticizers can inhibit the cure of *Dow Corning* D94-45M Liquid Silicone Rubber. The most notable are organo-tin and other organo-metallic compounds; silicone rubber containing an organo-tin catalyst; sulfur, polysulfides, polysulfones, and other sulfur-containing materials; and unsaturated hydrocarbon plasticizers. Many lubricating oils contain sulfur.

TYPICAL PROPERTIES–*continued*

Test	Unit	Result
As Cured—Fluid Immersion Resistance		
MOBIL®[5] 5W30 SG Oil, 168 hours at 150°C (302°F),		
change in durometer	points	-22
change in tensile	%	-54
change in elongation	%	-43
change in modulus	%	-27
volume swell	%	36
IRM 902 Oil, 168 hours at 150°C (302°F),		
change in durometer	points	-6
change in tensile	%	-22
change in elongation	%	-35
change in modulus	%	-13
volume swell	%	8
IRM 903 Oil, 168 hours at 150°C (302°F),		
change in durometer	points	-15
change in tensile	%	-56
change in elongation	%	-63
change in modulus	%	1
volume swell	%	41
ASTM #1 Oil, 168 hours at 150°C (302°F),		
change in durometer	points	-3
change in tensile	%	-18
change in elongation	%	-34
change in modulus	%	16
volume swell	%	4

[5]"MOBIL" is a registered trademark of Mobil Oil Corporation.

USABLE LIFE AND STORAGE

When stored in dry conditions below 35°C (95°F) in original containers, *Dow Corning* D94-45M Liquid Silicone Rubber has a shelf life of 18 months from the date of manufacture.

PACKAGING

Dow Corning D94-45M Liquid Silicone Rubber is available in 80-pound (5-gallon) pail kits and 800-pound (55-gallon) drum kits.

HANDLING PRECAUTIONS

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND MATERIAL SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE MATERIAL SAFETY DATA SHEET IS AVAILABLE FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY WRITING TO DOW CORNING CUSTOMER SERVICE, OR BY CALLING 1-517-496-6000.

LIMITATIONS

Do not use in applications where the product will be in constant contact with fuels or solvents. Mixing part A and part B at a ratio other than 1:1 may lead to poor product adhesion and seal performance.

This product is neither tested nor represented as suitable for medical or pharmaceutical uses. Not for human injection.

WARRANTY INFORMATION—PLEASE READ CAREFULLY

The information contained herein is offered in good faith and is believed to be accurate. However, because conditions and methods of use of our products are beyond our control, this information should not be used in substitution for customer's tests to ensure that Dow Corning's products are safe, effective, and fully satisfactory for the intended end use. Dow Corning's sole warranty is that the product will meet the Dow Corning sales specifications in effect at the time of shipment. Your exclusive remedy for breach of such warranty is limited to refund of purchase price or replacement of any product shown to be other than as warranted. Dow Corning specifically disclaims any other express of implied warranty of fitness for a particular purpose or merchantability. Unless Dow Corning provides you with a specific, duly signed endorsement of fitness for use, Dow Corning disclaims liability for any incidental or consequential damages. Suggestions of use shall not be taken as inducements to infringe any patent.

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