

Dow Corning[®] MS-1003 Moldable Silicone

FEATURES & BENEFITS

- Good transparency
- Medium viscosity for injection molding
- Good mold flow, excellent feature reproduction
- Two part material
- 1:1 mix ratio
- Lighter than glass
- Easily molded into complex shapes
- Readily reproduces fine details
- Better heat resistance than plastic
- Less yellowing than some plastic

COMPOSITION

- Polydimethylsiloxane

Dow Corning[®] MS-1003 Moldable Silicone is a medium viscosity, medium Shore A hardness, two-part, 1 to 1 ratio, fast curing optical molding resin for producing fine detail with good resistance to environmental aging.

APPLICATIONS

- Injection or compression molding for primary or secondary lenses, light pipes, light guides and other optic devices

TYPICAL PROPERTIES

Specification Writers: These values are not intended for use in preparing specifications. Please contact your local Dow Corning sales office or your Global Dow Corning Connection before writing specifications on this product.

Property	Unit	Result	
One or Two-Part	-	Two	
Viscosity (Part A)	cP	51,700	
	Pa-sec	51.7	
Viscosity (Part B)	cP	37,500	
	Pa-sec	37.5	
Viscosity (Mixed)	cP	42,250	
	Pa-sec	42.3	
Durometer Shore A	-	51	
Tensile Strength	psi	800	
	MPa	5.5	
	kg/cm ²	55	
Elongation	%	325	
Refractive Index at 633nm	-	1.41	
Transmission at 380nm, 3.2mm	%	91	
	450nm, 3.2mm	%	92
	760nm, 3.2mm	%	93
Working Time at 25 °C (Pot Life - hours)	hr	48	
Demold Time at 140 °C	2x12x125mm	sec	<17
	6x12x125mm	sec	<63
Linear CTE (by TMA)	ppm/°C	325	
Dielectric Strength	volts/mil	500	
	kV/mm	20	
Volume Resistivity	ohm*cm	1.5 x e16	

DESCRIPTION

Dow Corning[®] brand Optical Molding materials are designed to meet the challenging needs of the optical market; high purity, moisture resistance, thermal stability and optical transmittance. Injection

moldable optical silicone materials from Dow Corning are two-part, heat-cure silicone resins that are especially suitable for precision molding applications, as micrometer-sized features can be replicated on the lens surface to direct light output.

Silicone optical molding materials can be molded into complex shapes, withstand heat and resist yellowing better than plastic, and are lighter than glass. Parts have been fabricated using a variety of techniques, including injection molding, casting or cavity molding, transfer molding, and others.

MIXING AND DE-AIRING

Dow Corning silicone 1 to 1 Optical Molding materials are supplied in two parts that do not require lot matching. The 1 to 1 mix ratio, by weight or volume, simplifies the proportioning process. To ensure best properties Parts A and B must each be thoroughly mixed, inadequate mixing and may result in incomplete cure or reduced physical properties. Automated meter, mix and dispense equipment may be utilized. In applications or molds that are sensitive to air entrapment, de-airing or vacuum application in the mold may be helpful.

PROCESSING/CURING

These products are compatible with commercially available equipment and industry standard processes. These materials can be pumped, meter mixed and molded similarly to Liquid Silicone Rubber. Mix at 1 to 1 ratio. They are lower in viscosity than traditional LSR materials but they are not shear thinning as the LSR's are. This allows for reduced pressure in the pumping and mixing areas but similar performance in the injection unit compared to LSR's. In the mold the heat does thin the material dramatically allowing for good flow and reproduction in the mold cavity. *Dow Corning*[®] brand OS Fluids are recommended to clean cured or uncured silicone residue from application equipment.

POT LIFE AND CURE RATE

Cure reaction begins with the mixing process. Initially, cure is evidenced by a gradual increase in viscosity, followed by gelation and conversion to a solid elastoplastic material. Pot

life is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed and is highly temperature dependent. Please refer to the data table. The cure time depends on the thickness and the cure temperature used.

USEFUL TEMPERATURE RANGES

For most uses, silicone elastomers should be operational over a temperature range of -45 to 200 °C (-49 to 392 °F) for long periods of time. However, at both the low- and high temperature ends of the spectrum, behavior of the materials and performance in particular applications can become more complex and require additional considerations and should be adequately tested for the particular end use environment. For low-temperature performance, thermal cycling to conditions such as -55 °C (-67 °F) may be possible, but performance should be verified for your parts or assemblies. Factors that may influence performance are configuration and stress sensitivity of components, cooling rates and hold times, and prior temperature history. At the high-temperature end, the durability of the cured silicone elastomer is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

COMPATIBILITY

Certain materials, chemicals, curing agents and plasticizers can inhibit the cure of addition cure adhesives. Most notable of these include: organotin and other organometallic compounds, silicone rubber containing organotin catalyst, sulfur, polysulfides, polysulfones or other sulfur containing materials, unsaturated hydrocarbon plasticizers, and some solder flux residues. If a substrate or material is questionable with respect to potentially causing inhibition of cure, it is recommended that a small scale compatibility test be run to ascertain suitability in a

given application. The presence of liquid or uncured product at the interface between the questionable substrate and the cured material indicates incompatibility and inhibition of cure.

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 ON THE DOW CORNING WEB SITE AT DOWCORNING.COM, OR FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION.

LIMITATIONS

This product is neither tested nor represented as suitable for medical or pharmaceutical uses.

HEALTH AND ENVIRONMENTAL INFORMATION

To support Customers in their product safety needs, Dow Corning has an extensive Product Stewardship organization and a team of Product Safety and Regulatory Compliance (PS&RC) specialists available in each area.

For further information, please see our Website, dowcorning.com or consult your local Dow Corning representative.

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TODAY?**

Tell us about your performance, design and manufacturing challenges. Let us put our silicon-based materials expertise, application knowledge and processing experience to work for you.

For more information about our materials and capabilities, visit **dowcorning.com**.

To discuss how we could work together to meet your specific needs, email **electronics@dowcorning.com** or go to **dowcorning.com/contactus**

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