

Encapsulants

Sylgard[®] 170 Silicone Elastomer

FEATURES

- 1:1 mix ratio
- Low viscosity
- Low cost for silicone benefits
- Room temp or heat accelerated cure
Moderate thermal conductivity
- UL and Mil Spec tested

BENEFITS

- Rapid, versatile cure processing controlled by temperature
- Low viscosity enhances flow and fill in narrow spaces and around complex geometries
- Can be considered for uses requiring added flame resistance or Mil Spec testing

POTENTIAL USES

- General potting applications
- Power supplies
- Connectors
- Sensors
- Industrial controls
- Transformers
- Amplifiers
- High voltage resistor packs
- Relays

APPLICATION METHODS

- Automated mixing and dispensing
- Manual mixing

2-part, 1:1 mix, black, general purpose encapsulant with good flowability and flame resistance

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	Value
Viscosity (Part A)	cP	2675
	mPa-sec	2675
	Pa-sec	2.7
Viscosity (Part B)	cP	1425
	mPa-sec	1425
	Pa-sec	1.4
Viscosity (Mixed)	cP	2050
	mPa-sec	2050
	Pa-sec	2.1
Specific Gravity (Uncured Part A or Base)	-	1.34
Specific Gravity (Uncured Part B or Catalyst)	-	1.37
Cure Time at 25°C	hrs	24
Gel Time @ 25C	minutes	128.5
Heat Cure Time @50°C	minutes	45
Heat Cure Time @ 70°C	minutes	25
Heat Cure Time @ 85°C	minutes	15
Heat Cure Time @ 100°C	minutes	10
Durometer Shore A	-	50
Tensile Strength	psi	420
	MPa	2.9
	kg/cm2	29

DESCRIPTION

Dow Corning® silicone encapsulants are supplied as two-part liquid component kits. When liquid components are thoroughly mixed, the mixture cures to a flexible elastomer, which is well suited for the protection of electrical/electronic applications. Dow Corning silicone encapsulants cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement. Dow Corning silicone elastomers require no post cure and can be placed in service immediately following the completion of the cure schedule. Standard silicone encapsulants require a surface treatment with a primer in addition to good cleaning for adhesion while primerless silicone encapsulants require only good cleaning. Underwriters Laboratory (UL) 94 recognition is based on minimum thickness requirements. Please consult the UL Online Certifications Directory for the most accurate certification information.

MIXING AND DE-AIRING

These products are supplied in a 1:1 mix ratio, which is very robust in manufacturing environments and allows for some process and dispense equipment variation. In most cases de-airing is not required.

PREPARING SURFACES

In applications requiring adhesion, priming will be required for many of the silicone encapsulants. See the Primer Selection Guide for the correct primer to use with a given product. For best results, the primer should be applied in a very thin, uniform coating and then wiped off after application. After application, it should be thoroughly cured prior to application of the silicone elastomer. Additional instructions for primer usage can be found in the information sheets specific to the individual primers.

PROCESSING/CURING

Thoroughly mixed Dow Corning silicone encapsulant may be

TYPICAL PROPERTIES, continued

Property Uni	t	Value
Elongation	%	165
Tear Strength (Die B)	ppi	20
	N/cm	14
Dielectric Strength	volts/mil	475
	kV/mm	18
Dielectric Constant at 100 Hz	-	3.17
Dielectric Constant at 100 kHz	-	3.16
Volume Resistivity	ohm*cm	2.67E+15
Dissipation Factor at 100 hz	-	0.0027
Dissipation Factor at 100 kHz	-	0.00077
Linear CTE (by TMA)	ppm/°C	275
Thermal Conductivity	btu/hr ft degF	0.277
	W/mK	0.48
Agency Listing	-	UL 94V-0
Mil Specification	NA	Mil Spec

poured/dispensed directly into the container in which it is to be cured. Care should be taken to minimize air entrapment. When practical, pouring/dispensing should be done under vacuum, particularly if the component being potted or encapsulated has many small voids. If this technique cannot be used, the unit should be evacuated after the silicone encapsulant has been poured/dispensed. Dow Corning silicone encapsulants may be either room temperature (25°C/77°F) or heat cured. Room temperature cure encapsulants may also be heat accelerated for faster cure. Ideal cure conditions for each product are given in the product selection table. Two-part condensation cure encapsulants should not be heat accelerated above 60°C (140°F).

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 elastomer. 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 and application dependent. Please refer to the data table.

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. 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 gel indicates incompatibility and inhibition of cure.

REPAIRABILITY

In the manufacture of electrical/electronic devices it is often desirable to salvage or reclaim damaged or defective units. With most non-silicone rigid potting/encapsulating materials, removal or entry is difficult or impossible without causing excessive damage to internal circuitry. Dow Corning silicone encapsulants can be selectively removed with relative

ease, any repairs or changes accomplished, and the repaired area repotted in place with additional product. To remove silicone elastomers, simply cut with a sharp blade or knife and tear and remove unwanted material from the area to be repaired. Sections of the adhered elastomer are best removed from substrates and circuitry by mechanical action such as scraping or rubbing and can be assisted by applying Dow Corning® brand OS Fluids. Before applying additional encapsulant to a repaired device, roughen the exposed surfaces of the cured encapsulant with an abrasive paper and rinse with a suitable solvent. This will enhance adhesion and permit the repaired material to become an integral matrix with the existing encapsulant. Silicone prime coats are not recommended for adhering products to themselves.

PACKAGING

In general, Dow Corning silicone 1:1 mix ratio encapsulants are supplied in nominal 0.45-, 3.6-, 18- and 200-kg (1-, 8-, 40- and 440-lb) containers, net weight. Dow Corning silicone 10:1 mix ratio encapsulants are supplied in nominal 0.5-, 5-, 25- and 225-kg (1.1-, 11-, 55- and 495-lb) containers, net weight. Packaging options may vary by product. Consult Dow Corning Customer Service at (989) 496-6000 for additional packaging options.

STORAGE AND SHELF LIFE

Shelf life is indicated by the "Use Before" date found on the product label. Refer to the product label for storage temperature requirements. Special precautions must be taken to prevent moisture from contacting these materials. Containers should be kept tightly closed and head or air space minimized. Partially filled containers should be purged with dry air or other gases, such as nitrogen. Exposure to moisture could reduce adhesion and cause bubbles to form.

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 WEBSITE AT WWW.DOWCORNING.COM, OR FROM YOUR DOW CORNING REPRESENTATIVE, OR DISTRIBUTOR, OR BY CALLING YOUR GLOBAL DOW CORNING CONNECTION.

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, www.dowcorning.com or consult your local Dow Corning representative.

LIMITATIONS

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

LIMITED 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 our products are safe, effective, and fully satisfactory for the intended end use. Suggestions of

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