

Encapsulants

Sylgard® 182 Skleqqg Encunqo gt

FEATURES

- No exotherm during cure
- No solvents or cure byproducts
- Deep section cure
- Repairable
- Good dielectric properties
- Flexible elastomer

BENEFITS

- Easy to use and repair
- Transparent for easy board and part inspection
- Flexible
- Low stress

POTENTIAL USES

- General potting applications
- Power supplies
- Connectors
- Sensors
- Industrial controls
- Transformers
- Amplifiers
- High voltage resistor packs
- Relays
- Adhesive/encapsulant for solar cells
- Adhesive handling beam lead integrated circuits during processing

APPLICATION METHODS

- 10:1 ratio by weight or volume
- Automated or manual mixing and dispensing

Transparent; long pot life; two-part, 10:1 mix, heat cure

TYPICAL PROPERTIES

Specification Writers: 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 or Base)	cP	5475
	mPa-sec	5475
	Pa-sec	5.5
Viscosity (Mixed)	cP	4575
	mPa-sec	4575
	Pa-sec	4.6
Working Time at 25°C (Pot Life)	hr	8
Cure Time at 25°C	hrs	336
Heat Cure Time @ 100°C	minutes	75
Heat Cure Time @ 125°C	minutes	30
Heat Cure Time @ 150°C	minutes	20
Specific Gravity (Cured)	-	1.03
Tensile Strength	psi	1105
	Mpa	7.6
	kg/cm2	76
Elongation	%	105
Tensile Modulus	psi	1050
	MPa	7.3
	kg/cm2	73
Tear Strength (Die B)	ppi	25
	N/cm2	17
Durometer Shore A	-	51
Dielectric Strength	volts/mil	475
	kV/mm	19

MIXING AND DE-AIRING

Dow Corning silicone 10:1 encapsulants are supplied in two parts as lot-matched base and curing agent that are mixed in a ratio of 10 parts base to one part curing agent, by weight. After thoroughly mixing base and curing agent, agitate gently to reduce the amount of air introduced. Allowing the mixture to set for 30 minutes before pouring may be adequate for removal of the air introduced during mixing. If air bubbles are still present, vacuum deairing may be required. Deair in a container with at least four times the liquid volume to allow for expansion of material. Air entrapped in the mixture can be removed by using a vacuum of 28 to 30 inches Hg. Continue the vacuum until the liquid expands and settles to its original volume and bubbling subsides. This may take 15 minutes to 2 hours depending on the amount of air introduced during stirring. For best curing results, glassware and glass or metal stirring implements should be used. Mix with a smooth action that does not introduce excess air.

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 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.

PREPARING SURFACES

In applications requiring adhesion, priming will be required for 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

TYPICAL PROPERTIES, continued

Property	Unit	Value
Volume Resistivity	ohm*cm	1.61 E+15
Dielectric Constant at 100 Hz	NA	2.65
Dielectric Constant at 100 kHz	NA	2.65
Dissipation Factor at 100 hz	NA	0.0005
Dissipation Factor at 100 kHz	NA	0.0005
Refractive Index	-	1.41
Linear CTE (by TMA)	ppm/°C	325
Thermal Conductivity	btu/hr ft degF W/mK	0.277 0.16
UL Flammability Classification	NA	94 V-1
Shelf Life at 25°C	months	24

in a very thin, uniform coating and then wiped off after application. After application, it should be thoroughly air dried 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 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 re-potted 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. For best results, Dow Corning silicone encapsulants should be stored at or below 25°C (77°F). 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.

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.

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These products are neither tested nor represented as suitable for medical or pharmaceutical uses.

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