Technical Data Sheet

DOWSIL™ EI-2888 Primerless Silicone Encapsulant

Optically clear, 2-part 1:1 mix ratio, low viscosity, self priming silicone encapsulant

Features & Benefits

- Room temperature cure with optional heat acceleration
- Low viscosity – ease of processing
- Self priming – no primer needed
- 100% silicone (PDMS)
- UL 94 recognized

Applications

DOWSIL™ EI-2888 Primerless Silicone Encapsulant is particularly suitable for encapsulating rigid and flexible circuit boards for indoor and outdoor LED Lighting, explosion proof and high ingress protection rated luminaire as well as outdoor displays applications.

Typical Properties

Specification Writers: These values are not intended for use in preparing specifications.

Test[1]	Property	Unit	Result
	One or two-part		Two
	Mix ratio		1:1
CTM 0176B	Appearance		Clear
CTM 0050	Viscosity Part A	mPa-Sec	2000
CTM 0050	Viscosity Part B	mPa-Sec	2300
CTM 0050	Viscosity mixed	mPa-Sec	2700
	Gel time (G'=G") at 22°C[2]	hrs	8
CTM 0055	Pot life at 22°C[2]	min	130
CTM 0099	Durometer after 24 hrs	Shore 00	7 (22°C) – 28 (50°C)
CTM 0099	Durometer after 3 days at 22°C	Shore 00	35
CTM 0099	Durometer after 7 days at 22°C	Shore 00	45
CTM 0099	Durometer after 21 days at 22°C	Shore 00 Shore A	60 10
ASTM D 412	Tensile strength	MPa	0.2

1. CTM: Corporate Test Method, copies of CTM's are available on request. ASTM: American Society for Testing and Materials.
2. Can vary due to environmental condition (humidity, mixing method)

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Typical Properties (Cont.)

Test	Property	Unit	Result
ASTM D 412	Elongation	%	190
CTM 0243	Unprimed lap shear (AL)	MPa	0.17
CTM 0114	Dielectric strength	kV/mm	19
CTM 0249	Volume resistivity	Ohm*cm	1E + 16
ASTM D 1003	Light transmission @ 380 nm, 5 mm	%	91
ASTM D 1003	Light transmission @ 450 nm, 5 mm	%	94
ASTM D 1003	Light transmission @ 760 nm, 5 mm	%	95
	Shelf life at 22°C	months	12

Description

DOWSIL™ EI-2888 Primerless Encapsulant is supplied as two-part liquid component. When liquid components are thoroughly mixed either by weight or volume, the mixture cures at room temperature or with mild heat to a flexible elastomer, which is well suited for the protection of rigid and flexible circuit boards for indoor or outdoor LED Lighting, explosion proof and high ingress protection rated luminaire as well as outdoor displays.

Dow silicone encapsulants cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement. This encapsulant contains its own source of moisture, so cure progresses evenly throughout the material and deep-section or confined space cures are possible.

Self priming encapsulant develop reliable adhesion to a wide range of substrates at room temperature or with mild heat, without the need of primer. Only good cleaning may be needed.

Unlike other silicone chemistries, this product is unsensitive to phenomena like Platinum catalyst inhibition when exposed to contaminant, or material reversion when exposed to high temperature in a confined environment.

Dow silicone elastomers require no post cure and can be placed in service immediately following the completion of the cure schedule.

Dow silicone elastomers retain their original physical and electrical properties over a broad range of operating conditions which enhance the reliability of and service life of devices.

Application Methods

- Automated static or dynamic metered mixing
- Manual mixing
- Flow, pour, or needle dispense

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Processing/ Curing

Thoroughly mixed Dow 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 silicone encapsulants may be either room temperature (25°C/77°F) or heat cured (max 60°C/140°F). Room temperature cure encapsulants may also be heat accelerated for faster cure. Ideal cure conditions are given in the product selection table.

Time to cure is dependent on several variables including the method of application, film thickness, temperature and humidity. Gel time in the data table gives an indication of typical times to form a gel. Cure time for full cure are indications of time needed to develop full physical properties such as durometer, tensile strength or adhesion. These times, including full cure time, can be significantly improved by introducing mild heat of 60°C/140°F or less.

Adhesion does not need the full cure schedule to develop, material can therefore be put in service before finishing the full cure schedule in majority of the cases. Optimum cure schedules should be determined in each new application.

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 DOWSIL™ EI-2888 Primerless Silicone Encapsulant Part A and DOWSIL™ EI-2888 Primerless Silicone Encapsulant Part B (base and curing agent) are mixed and is highly temperature and application dependent. Please refer to the data table. Gel time in the data table gives an indication of typical times to form a non-flowing gel. Cure time for full cure are indications of time needed to develop full physical properties such as durometer, tensile strength or adhesion

Adhesion

Dow self priming encapsulants are formulated to provide adhesion to most common substrates and materials. It is recommended that the encapsulant be applied to clean and dry substrates prior to application. Due to the vast variety of substrates used, general statements on adhesion and bond strength are impossible. Appropriate adhesion testing should be performed to insure the adhesion of the encapsulant is adequate for the end use.

As adhesion evolve with time during cure, adhesion will increase until full cure at room temperature. On certain difficult, low-surface energy surfaces, adhesion may be improved by priming or by special Dow self priming encapsulants are formulated to provide adhesion to most common substrates and materials. It is recommended that the encapsulant be applied to clean and dry substrates prior to application. Due to the vast variety of substrates used, general statements on adhesion and bond strength are impossible. Appropriate adhesion testing should be performed to insure the adhesion of the encapsulant is adequate for the end use.

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Adhesion (Cont.)

As adhesion evolve with time during cure, adhesion will increase until full cure at room temperature. On certain difficult, low-surface energy surfaces, adhesion may be improved by priming or by special surface treatment such as chemical or plasma etching. To ensure maximum bond strength on a particular substrate, cohesive failure of the product in a lap shear or similar test is needed to ensure compatibility of the adhesive with the substrate being considered. Also, this test can be used to determine minimum cure time or to detect the presence of surface contaminants such as mold release agents, oils, greases and oxide films.

Handling Precautions

PRODUCT SAFETY INFORMATION REQUIRED FOR SAFE USE IS NOT INCLUDED IN THIS DOCUMENT. BEFORE HANDLING, READ PRODUCT AND SAFETY DATA SHEETS AND CONTAINER LABELS FOR SAFE USE, PHYSICAL AND HEALTH HAZARD INFORMATION. THE SAFETY DATA SHEET IS AVAILABLE ON THE DOW WEBSITE AT CONSUMER.DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

Special precautions must be taken to prevent moisture from contacting this product. 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. The product should be stored in its original packaging with the cover tightly attached to avoid any contamination. Store in accordance with any special instructions listed on the product label. The product should be used by its Use Before date as indicated on the product label.

Useful Temperature Ranges

For most uses, silicone encapsulants 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. At high temperature ends (150°C and above), the optical performance of the material could be degraded even if the mechanical properties remains acceptable. The optical degradation is time and temperature dependent and should be evaluated for your specific application. 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.

Packaging Information

Multiple packaging sizes are available for this product. Please contact your local distributor or Dow representative for information on packaging size and availability.

Limitations

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

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Health And Environmental Information

To support customers in their product safety needs, Dow has an extensive Product Stewardship organization and a team of product safety and regulatory compliance specialists available in each area.

For further information, please see our website, consumer.dow.com or consult your local Dow representative.

How Can We Help You 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.

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To discuss how we could work together to meet your specific needs, go to **consumer.dow.com** for a contact close to your location. Dow has customer service teams, science and technology centers, application support teams, sales offices, and manufacturing sites around the globe.

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