Technical Data Sheet

DOWSIL™ TC-6015 Thermally Conductive Encapsulant

Two-part, 1 to 1 mix, grey silicone elastomer room temperature cure with optional heat acceleration for manufacturing flexibility. Thermally conductive encapsulant for electronics assemblies, providing protection against harsh environmental conditions and for thermal management.

Features & Benefits

- Thermal conductivity 1.6 W/m·K
- Low density
- High flowability/rheology control
- Minimal filler settling and no hard caking
- Room temperature curable with accelerated heat option
- Self-adhesion
- Excellent flame retardancy UL 94 V-0; RTI 150°C
- High reliability performance

Composition

- Two-part
- Polydimethylsiloxane

Applications

DOWSIL™ TC-6015 Thermally Conductive Encapsulant is suitable for:

- PV inverter
- Energy storage system
- Automotive control unit/EV module
- High-power modules

Typical Properties

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

Property	Unit	Result
One or Two-part		Two-part
Color		
Part A		White to off-white
Part B		Grey
Mixed		Grey
Viscosity		
Part A (HBDV-III 3#, 100 rpm)	mPa·s	4300
Part B (HBDV-III 3 #, 100 rpm)	mPa·s	3600
Mixed (HBDV-III 3 #, 100 rpm)	mPa·s	4000

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Typical Properties (Cont.)

Property	Unit	Result
Pot Life at 25°C	minutes	90
Specific Gravity	g/cm^3	2.25
Heat Cure Time at 70°C	minutes	30
Durometer	Shore A	40
Thermal Conductivity	W/m·K	1.6
Tensile Strength	MPa	0.7
Elongation	%	30
Lap Shear (AL/AL) (Room Temperature Cure for 24hrs)	Mpa	0.6
Dielectric Strength	kV/mm	15.3
Volume Resistivity	Ohm·cm	4.9E+14
Linear CTE (by TMA)	ppm/°C	108
UL Flammability Classification		UL94 V-0

Description

DOWSIL™ TC-6015 Thermally Conductive Encapsulant is a two-component silicone encapsulant material. It is designed especially for use in the manufacture of electrical and PCB products and modules. It cures at room temperature or with heat to form elastic and thermally conductive encapsulant.

Application Methods

Manual or automated needle dispense.

Mixing and De-airing

DOWSIL™ TC-6015 Thermally Conductive Encapsulant is supplied in lot matched kits consisting of Part A and Part B in separate containers. During storage, some of the filler may settle at the bottom of the containers and should be individually homogenized prior to use. The two components should be thoroughly mixed using a weight or volume ratio of 1:1 until the mixture has a uniform color. Vacuum de-airing is recommended. A residual pressure of 10–20 mm mercury applied for 10 minutes will sufficiently de-air the material.

Processing/Curing

Apply the encapsulant, being careful to avoid air entrapment. Vacuum encapsulation is recommended for complex geometries. For information on appropriate dispensing equipment for your application, please contact local Dow TS&D.

DOWSIL™ TC-6015 Thermally Conductive Encapsulant should be cured using one of the following recommended schedules:

- 30 minutes at 70°C
- 180 minutes at 25°C can reach ~15 shore A

Large components and assemblies may require longer times in order to reach the curing temperature.

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 its final state. Pot life is defined as the time required for viscosity to double after Parts A and B (base and curing agent) are mixed.

Useful Temperature Ranges

For most uses, silicone rubber 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 for most products, 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 silicones is time and temperature dependent. As expected, the higher the temperature, the shorter the time the material will remain useable.

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 DOW.COM, OR FROM YOUR DOW SALES APPLICATION ENGINEER, OR DISTRIBUTOR, OR BY CALLING DOW CUSTOMER SERVICE.

Usable Life and Storage

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. Encapsulant materials which contain higher levels of fillers that have been stored for long periods of time should typically be agitated or rolled prior to mixing to prevent separation and settle-out.

Packaging Information

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.

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, dow.com or consult your local Dow representative.

Disposal Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user’s responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Technical Representative for more information.

Product Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

How Can We Help You Today?

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

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

To discuss how we could work together to address your specific needs, go to **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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