



## DOWSIL™ TC-6032 Thermally Conductive Encapsulant

DOWSIL™ TC-6032 Thermally Conductive Encapsulant is 1 to 1 two-part, flowable, thermally conductive product.

### Features & Benefits

- Two-part material
- Flowable – able to fill and self-level after dispensing
- Versatile heat cure
- Thermally conductive – heat dissipation from sensitive components

### Composition

- Thermally conductive filler
- Polydimethylsiloxane

### Applications

- On-board charger
- Inverter / converter
- Transformer
- Other electronic and electric components

### Application Methods

- Automated or manual mixing and dispensing

### Typical Properties

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

Test	Property <sup>3</sup>	Unit	Result
	One Part or Two Part		Two
	Mixing Ratio by Weight		1 to 1
CTM <sup>1</sup> 0176B(ASTM <sup>2</sup> E284)	Color, Part A/B		White/blue
CTM 0050(ASTM D1084)	Viscosity, Part A / Part B / Mixed	mPa·s	8,000 / 4,000 / 6,500
CTM 0099(ASTM D2240)	Heat Cure Time <sup>4</sup> at 80°C	minutes	60
	at 100°C		30
	at 120°C		20

1. CTM: Corporate Test Method, copies of CTM's are available on request.
2. ASTM: American Society of Testing and Materials.
3. Property is in accordance with standard cure condition of 60 minutes at 120°C unless specified.
4. Cure condition needs to be tested and optimized with customer's application and curing environment.

## Typical Properties (Cont.)

Test	Property	Unit	Result
CTM 0055(ASTM D1824)	Pot Life <sup>5</sup> (Working Time) at 25°C	hour	4
CTM 0044(ASTM D70)	Specific Gravity, Part A / Part B at 25°C		2.73 / 2.73
CTM 0022(ASTM D792)	Specific Gravity, Cured at 25°C		2.75
CTM 0099(ASTM D2240)	Hardness, Shore A		34
CTM 0243(ASTM D1002)	Adhesion Strength on Al @ 80°C*60 min	MPa	0.38
	@ 100°C*30 min		0.38
	@ 120°C*20 min		0.44
CTM 1163(ASTM D7984)	Thermal Conductivity at 25°C	W/m·K	3.2
CTM 0137A(ASTM D412)	Tensile Strength	MPa	0.5
CTM 0137A(ASTM D412)	Elongation	%	45
CTM 1098(ASTM D4065)	Shear Modulus by DMA at 25°C	MPa	1.55
CTM 0114(ASTMD149)	Dielectric Strength	kV/mm	18
CTM 0249(ASTM D257)	Volume Resistivity	Ohm·cm	1.3 x 10 <sup>14</sup>
CTM 0112(ASTM D150)	Dielectric Constant at 100 Hz		3.22
CTM 0112(ASTM D150)	Dielectric Constant at 100 kHz		3.66
CTM 0112(ASTM D150)	Dissipation Factor at 100 Hz		0.0029
CTM 0112(ASTM D150)	Dissipation Factor at 100 kHz		0.0023
CTM 0585(ASTM E831)	Coefficient of Thermal Expansion; CTE (-40 to 150°C)	ppm/K	80
CTM 0839(ASTM F2466)	Volatile Siloxane Contents(D4-D10)	ppm	< 100
UL 94	UL 94 Flammability Classification		V-0

5. Pot Life is described as the time necessary for a system to double in viscosity after catalyzation. This is considered to be the normal useable working time.

### Description

DOWSIL™ TC-6032 Thermally Conductive Encapsulant is a two-component silicone elastomer material. It is designed especially for use in the manufacture of electrical and PCB system assembly products and modules. It cures with heat to form elastic, thermally conductive rubber.

### Processing/Curing

Addition-cure materials can be cured with heat. The cure rate is rapidly accelerated with heat. Cure progresses evenly throughout the material.

Addition-curing materials contain all the ingredients needed for cure with no by-products from the cure mechanism. Deep-section or confined cures are possible.

### 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.

## **Mixing and De-airing**

Upon standing, some filler may settle to the bottom of the liquid after several weeks. To ensure a uniform product mix, the material in each container should be thoroughly mixed prior to use. Two-part materials should be mixed in the proper ratio either by weight or volume. The presence of light-colored streaks or marbling indicates inadequate mixing. Automated airless dispense equipment can be used to reduce or avoid the need to de-air. If de-airing is required to reduce voids in the cured elastomer, consider a vacuum de-air schedule of > 8 inches Hg (or a residual pressure of 10–0 mm of Hg) for 10 minutes or until bubbling subsides.

## **Useful Temperature Ranges**

For most uses, silicone encapsulant should be operational over a temperature range of -45 to 150°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.

## **Solvent Exposure**

In general, the product is resistance to minimal or intermittent solvent exposure, however best practice is to avoid solvent exposure altogether.

## **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 By” date found on the product label. Any special storage and handling instructions will be printed on the product containers.

For best results, Dow thermally conductive materials should be stored at or below the maximum specified storage temperature. 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. Any special storage and handling instructions will be printed on the product containers.

## **Packaging Information**

20 L pail is only available for this product. Please contact your local distributor or Dow, if you need different package.

## **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](http://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](http://dow.com).

To discuss how we could work together to address your specific needs, go to [dow.com](http://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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