Technical Data Sheet

DOWSIL™ TC-5515 LT Low Density Thermal Conductive Gap Filler

2.0 W/m·K silicone gap filler, two-part material curing at room temperature

Features & Benefits

- Thermal conductivity 2.0 W/m·K
- Specific gravity (cured) 1.95
- Non-flowable at both flat and vertical conditions once dispensed
- Room-temperature cure or heat-accelerated cure
- Working temperature range: -40–150°C
- Holds vertical position in application once cured
- Soft compressible and stress relief in vibration application once cured
- Surface tacky once cured, easy to rework after curing and assembly
- UL 94 V0

Applications

DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler is a soft and compressible material once cured, designed to dissipate heat from electronic devices, EV modules or other heat-generating components.

Typical Properties

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

Test	Property	Unit	Result
CTM[1] 0176	One- or Two-part		Two
CTM 0176	Mix Ratio (Weight or Volume)		1:1
CTM 0176, ASTM[2] E284	Color - Part A		White
CTM 0176, ASTM E284	Color - Part B		Blue
CTM 1094, ASTM D4287	Viscosity at 10 s^{-1}, Part A	Pa·s	150
CTM 1094, ASTM D4287	Viscosity at 10 s^{-1}, Part B	Pa·s	120
CTM 1094, ASTM D4287	Viscosity at 10 s^{-1}, Part Mixed	Pa·s	140
CTM 1094, ASTM D4287	Thixotropic Index, Mixed (1 s^{-1}/10 s^{-1})		3.5
CTM 1094, ASTM D4287	Working Time at 25°C	min	90
CTM 0044, ASTM D70	Specific Gravity, Part A/B		1.95
CTM 0022, ASTM D792	Specific Gravity, Cured		1.95
CTM 0099, ASTM D 2240	Cure Time at 25°C	min	360

1. CTM: Corporate Test Method.
2. ASTM: American Society for Testing and Materials.

®™Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

© 2019–2020 The Dow Chemical Company. All rights reserved.

Form No. 11-4080-01-0520 S2D

Typical Properties (Cont.)

Test	Property	Unit	Result
CTM 0099, ASTM D 2240	Cure Time at 80°C	min	30
CTM 0099, ASTM D 2240	Durometer	Shore 00	65
CTM 1163, ISO[3] 22007-2	Thermal Conductivity (Hot Disk)	W/m·K	2.00
CTM 0069, ASTM D5470	Thermal Conductivity	W/m·K	1.70
ASTM E1269	Heat Capacity at 20°C at 80°C at 150°C	J/g·°C	1.40 1.58 1.72
CTM 0114, ASTM D149	Dielectric Strength (Cured)	kV/mm	19.0
CTM 0249, ASTM D257	Volume Resistivity	Ohm·cm	≥ 1.0 E+13
CTM 0112, ASTM D150	Dielectric Constant at 100K HZ		3.0
CTM 0112, ASTM D150	Dissipation Factor at 100K HZ		0.0087
CTM 0243, ASTM D1002	Lap Shear Strength (Al/Al)	MPa	0.20
CTM 1098, ASTM D4065	Shear Modulus (DMA)	MPa	0.27
CTM 0585, ASTM E831	CTE (-40 to 150°C)	ppm/K	132
CTM 1140	Minimum BLT (0.14 MPa)	µm	136
UL[4] 94	UL Flame Classification		UL 94 V0
	Shelf Life at 25°C	months	6

3. ISO: International Organization for Standardization
4. UL: Underwriters Laboratories

Description

DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler is a soft and compressible material capable of dissipating the heat from a heat source (typically EV modules, printed circuit board) to a cold source (typically aluminum housing acting as a heat sink). This material has been specifically designed to provide reliable cooling performance in EV battery and control unit modules due to the stability of properties during typical environmental exposure simulating the entire operating life of such a module.

DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler is supplied as a two-part liquid component kit. When the liquid components are thoroughly mixed 1:1 either by weight or volume, the mixture cures to a soft elastomer. Curing occurs without exothermal reaction at a constant rate regardless of sectional thickness or degree of confinement.

DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler requires no post-cure and can be placed in service immediately at operating temperatures of -45 to 150°C following the completion of the cure schedule. Thermally conductive silicones function over a wide temperature and humidity range as heat transfer media with long-term, reliable protection of sensitive circuits and as stress-relieving shock and vibration absorbers, provide a durable dielectric insulation, and are barriers against environmental contaminants.

®™Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

© 2019–2020 The Dow Chemical Company. All rights reserved.

Description (Cont.)

In addition to sustaining their physical and electrical properties over a broad range of operating conditions, silicones are resistant to ozone and ultraviolet degradation and have good chemical stability. Silicones also have a low surface tension that enables them to wet most surfaces, which can lower the thermal contact resistance between the substrate and the silicone material, resulting in good heat transfer between the heat producing device and the heat dissipating part.

How to Use

Two-part materials should be mixed in the proper ratio either by weight or volume. Static mixer is recommended for manual and automated mixing.

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.

Although the formulation design of DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler is made to minimize the risk of filler settlement, upon standing, in rare occasion some filler may settle to the bottom of the liquid after several weeks. Should that be the case, in order to ensure a uniform product mix, the material in each container should be thoroughly mixed prior to use.

Processing/ Curing

Addition-cure materials can be cured at room temperature or with heat. The cure rate is rapidly accelerated with heat (see cure times in Typical Properties table). 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 its final state. Working time is defined as the time required for viscosity to double after Parts A and B are mixed.

Useful Temperature Ranges

For most uses, DOWSIL™ TC-5515 LT Low Density Thermally Conductive Gap Filler should be operational over a temperature range of -45 to 150°C 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.

© 2019–2020 The Dow Chemical Company. All rights reserved.

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, DOWSIL™ TC-5515 LT Thermally Conductive Gap Filler 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

Multiple packaging sizes are available for this product. Please contact your local distributor or Dow.

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.

®™Trademark of The Dow Chemical Company ("Dow") or an affiliated company of Dow

© 2019–2020 The Dow Chemical Company. All rights reserved.

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 expertise, 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 meet 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.

dow.com

NOTICE: No freedom from infringement of any patent owned by Dow or others is to be inferred. Because use conditions and applicable laws may differ from one location to another and may change with time, Customer is responsible for determining whether products and the information in this document are appropriate for Customer's use and for ensuring that Customer's workplace and disposal practices are in compliance with applicable laws and other government enactments. The product shown in this literature may not be available for sale and/or available in all geographies where Dow is represented. The claims made may not have been approved for use in all countries. Dow assumes no obligation or liability for the information in this document. References to "Dow" or the "Company" mean the Dow legal entity selling the products to Customer unless otherwise expressly noted. NO WARRANTIES ARE GIVEN; ALL IMPLIED WARRANTIES OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE ARE EXPRESSLY EXCLUDED.

®Trademark of The Dow Chemical Company

Form No. 11-4080-01-0520 S2D