



DOWSIL™ TC-4525 CV Thermally Conductive Gap Filler

2.5 W/m-K silicone gap filler material for automotive components; a two-part material curing at room temperature with controlled silicone volatility

Features & Benefits

- Thermal conductivity: > 2.5 W/m-K
- Room temperature cure
- Long term performance stability during temperature cycling up to 150°C
- Low compression stress
- Holds vertical position (cured or uncured state)
- Controlled silicone volatility

Composition

- Silicone gel matrix for long term reliability
- Treated alumina to enhance thermal conductivity while managing stability of bulk properties
- Platinum cure system for a fast controlled cure

Applications

- DOWSIL™ TC-4525 CV Thermally Conductive Gap Filler is a soft and compressible material once cured, designed to dissipate the heat from components mounted on printed circuit board to heat sink providing a reliable cooling solution for modules like an engine or transmission control unit.
- This material is specifically designed for a smooth assembly process line integration ideally suited for automated dispensing with meter mix equipment.

Typical Properties

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

Property	Unit	Result
One or Two-part		Two
Mix Ratio (Weight or Volume)		1:1
Color A/B		White/blue
Viscosity, Part A	Pa.s	223
Viscosity, Part B	Pa.s	216
Viscosity, Mixed	Pa.s	217
Thixotropic Index (Mixed) Steady Shear: 1 s ⁻¹ /10 s ⁻¹		4.0
Density (Cured) at 25°C	g/cm ³	2.9

Typical Properties (Cont.)

Property	Unit	Result
Working Time at 25°C	minutes	40
Cure Time at 25°C	minutes	120
Cure time at 80°C	minutes	10
Thermal Conductivity by Transient Method	W/m-K	2.5
Hardness	Shore 00	40
	Asker C	32
Volume Resistivity		2.6E14
Dielectric Strength	kV/mm	12
Dissipation Factor at 1 MHz		5E-3
Dielectric Constant at 1 MHz		6.2

Description

DOWSIL™ TC-4525 CV Thermally Conductive Gap Filler is a soft and compressible material capable to dissipate the heat from the heat source (typically a printed circuit board) to the cold source (typically aluminum housing acting as a heat sink).

This material has been specifically designed to provide reliable cooling performance in automotive modules due to the stability of properties during typical environmental exposure simulating the entire operating life of the module.

DOWSIL™ TC-4525 CV Thermally Conductive Gap Filler is supplied as a two-part liquid component kits. When the liquid components are thoroughly mixed either by weight or volume, the mixture cures to a soft elastomer. These elastomers cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement.

Dow thermally conductive gap fillers require no post-cure and can be placed in service immediately at operating temperatures of -45°C to 150°C following the completion of the cure schedule. Exposure at higher temperature up to 200°C is allowed for short period. Thermally conductive silicones function as heat transfer media, with long-term, reliable protection of sensitive circuits, provide a durable dielectric insulation, and are barriers against environmental contaminants and as stress-relieving shock and vibration absorbers over a wide temperature and humidity range. 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. Good heat transfer is dependent on a good interface between the heat producing device and the heat transfer media.

Silicones have a low surface tension that enables them to wet most surfaces, which can lower the thermal contact resistance between the substrate and the material.

How 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.

How to Use (Cont.)	Although the formulation design of DOWSIL™ TC-4525 CV 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 it be the case in order to ensure a uniform product mix, the material in each container should be thoroughly mixed prior to use although typically no homogenization is required.
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 gradual increase in viscosity, followed by gelation and conversion to its final state. 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.
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	Multiple packaging sizes are available for this product.
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 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.

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