



Technical Data Sheet

DOWSIL™ TC-4025 Dispensable Thermal Pad

DOWSIL™ TC-4025 Dispensable Thermal Pad is a two-part, 1 to 1 mix ratio, thermally conductive dispensable pad.

Features & Benefits

- Use as printable or dispensable PAD to replace traditional fabricated pad
- Use as gap filler
- Dispensed or printed through a variety of manual or automated processes
- Finer feature deposit for precise component coverage
- Lower cost of ownership than fabricated pad
- Excellent thermal performance
- Soft, stress relieving, shock dampening
- Reworkable

Composition

- Two-part
- Polydimethylsiloxane

Applications

- Suitable thermal interface material for telecom devices, lamps and luminaires

Typical Properties

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

Property	Unit	Result
Color		
Part A		White to off-white
Part B		Blue
Mixed		Blue
Viscosity (Part A)	cP	126,000
Viscosity (Part B)	cP	127,000
Viscosity (Mixed)	cP	119,000
Specific Gravity (Cured)	gm-cm ³	2.81
Cured Time at 25°C	hours	24

Typical Properties (Cont.)

Property	Unit	Result
Working Time (Pot Life - hours) at 25°C	hours	5
Heat Cure Time at 125°C	minutes	30
Durometer	Shore 00	61
Thermal conductivity	W/mK	2.51
Tensile strength	MPa	0.34
Elongation	%	66
Dielectric strength	kV/mm	15.4
Volume resistivity	Ohm.cm	8.84E13
Dissipation factor at 100 Hz		0.34
Dissipation factor at 100 kHz		0.004
Dielectric constant at 100 Hz		3.31
Dielectric constant at 100 kHz		2.94
UL Flammability	UL94	V-0
Shelf life	Months	9

Description

DOWSIL™ TC-4025 Dispensable Thermal Pad is supplied as two-part liquid component kits. When the liquid components are thoroughly mixed, the mixture cures to a flexible elastomer, suitable for the protection of PCB system applications where heat dissipation is critical. These elastomers cure without exotherm at a constant rate regardless of sectional thickness or degree of confinement.

DOWSIL™ TC-4025 Dispensable Thermal Pad requires no post-cure and can be placed in service immediately at operating temperatures of -45 to 200°C (-49 to 392°F) following the completion of the cure schedule. PCB system assemblies are continually designed to deliver higher performance. Especially in the area of consumer devices, there is also a continual trend towards smaller, more compact designs. In combination these factors typically mean that more heat is generated in the device.

Thermal management of devices is a primary concern of design engineers. A cooler device allows for more efficient operation and better reliability over the life of the device. As such, thermally conductive compounds play an integral role here. Thermally conductive materials act as a thermal "bridge" to remove heat from a heat source (device) to the ambient via a heat transfer media (i.e. heat sink). These materials have properties such as low thermal resistance, high thermal conductivity, and can achieve thin Bond Line Thicknesses (BLTs) which can help to improve the transfer of heat away from the device.

Application Methods

This material is designed to be applied by various methods including:

- Automated dispensing
- Stencil printing
- Screen printing

Please contact your local Dow representative with any specific application questions.

Mixing and De-Airing

DOWSIL™ TC-4025 Dispensable Thermal Pad exhibits minor polymer separation during transportation. Before each use ensure the material is homogeneous. Recommendations for re-homogenization can be found in the application guides. 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.

Processing and Curing

Addition-cure silicones should be cured at 100°C (212°F) or above. The cure rate is rapidly accelerated with heat (see heat-cure times in Typical Properties table). For thicker sections, a pre-cure at 70°C (158°F) may be necessary to reduce voids in the elastomer. Length of pre-cure will depend on section thickness and confinement of adhesive. It is recommended that 30 minutes at 70°C (158°F) be used as a starting point for determining necessary pre-cure time. 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. Cure progresses evenly throughout the material. These products generally have long working times.

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 (DOWSIL™ TC-4025 Dispensable Thermal Pad Base and DOWSIL™ TC-4025 Dispensable Thermal Pad Curing Agent) are mixed.

Useful Temperature Ranges

For most uses, silicone dispensable thermal pads 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.

Solvent Exposure

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

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DOWSIL™ TC-4025 Dispensable Thermal Pad

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Handling Precautions

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Usable Life and Storage

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 the indicated Expiration Date found on the label.

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.

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How Can We Help You Today?

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