



Technical Data Sheet

DOWSIL™ TC-4083 Dispensable Thermal Pad

Two-part, 1 to 1 mix ratio, thermally conductive dispensable pad

Features & Benefits

- Used as printable or dispensable pad to replace traditional fabricated pad
- Used as gap filler
- Dispensable 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 for thermal interface material for telecom devices

Typical Properties

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

ASTM ¹	Property	Unit	Result
	One or two-part		Two
	Color		
	Part A		Off-white to grey
	Part B		Blue
	Mixed		Blue
D2452-94	Extrusion Rate Part A	G/min	65
D2452-94	Extrusion Rate Part B	G/min	65
D2452-94	Extrusion Rate Mixed	G/min	65
D70-97	Specific Gravity (Uncured)		3.2
D792-91	Specific Gravity (Cured)		3.2
D1338-91	Working Time at 25°C	Min	180
D4065-95	Cure Time at 25°C	Hour	24

1. ASTM: American Society for Testing and Materials.

Typical Properties (Cont.)

Test	Property	Unit	Result
D4065-95	Heat Cure Time at 80°C	Min	60
D2240-97	Durometer	Shore 00	58
Hotdisk	Thermal Conductivity	W/mK	10.0
5470	Thermal Conductivity	W/mK	8.2
5470	Thermal Resistance at 40 psi	°C.cm ² /W	0.18
5470	BLT (Bond line thickness) at 40 psi	Micron	120
D2369-97	NVC	%	99.9
D149-97a	Dielectric Strength	KV/mm	9.5
D257-93	Volume Resistivity	Ohm*cm	1.6E+13
	UL Flammability Classification	UL94	V-0

Description

DOWSIL™ TC-4083 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 electrical/ electronic 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-4083 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. Electronic devices are continually designed to deliver higher performance. Especially in the area of consumer electronics, 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 electronic 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 materials 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

- Automated dispensing
- Stencil printing

Mixing and De-airing

DOWSIL™ brand dispensable thermal pads exhibit 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/Curing	Addition-cure silicones should be cured at room temperature or above. The cure rate is rapidly accelerated with heat (see heat-cure times in Typical Properties table). 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 (base and 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 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	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 Exp. Date found on the label.
Limitations	This product is neither tested nor represented as suitable for medical or pharmaceutical uses.
Health and Environmental Information	<p>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.</p> <p>For further information, please see our website, dow.com or consult your local Dow representative.</p>
Disposal Considerations	<p>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.</p> <p>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.</p>

Product Stewardship

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