THERMFLOW®

Non-Silicone, Phase-Change Thermal Interface Pads

THERMFLOW® phase-change Thermal Interface Materials (TIMs) completely fill interfacial air gaps and voids.

FEATURES/BENEFITS

- Low thermal impedance
- Proven solution – years of production use in personal computer OEM applications
- Demonstrated reliability through thermal cycling and accelerated age testing
- Can be pre-applied to heat sinks
- Protective release liner prevents contamination of material prior to final component assembly
- Tabs available for easy removal of release liner (T710, T725*, T557, T777, PC07DM)
  * T725 is only offered with a tab
- Available in custom die-cut shapes, kiss-cut on rolls

THERMFLOW phase-change materials are designed to displace entrapped air between power dissipating electronic components. Phase-change materials maximize heat sink performance and improve component reliability. THERMFLOW pads soften as they reach component operating temperatures.

Upon reaching operating temperature, THERMFLOW materials will fully change phase and attain minimum bond-line thickness (MBLT) to maximize surface wetting. This results in practically no thermal contact resistance due to a very small thermal resistance path.

At room temperature, THERMFLOW materials are solid and easy to handle. This allows them to be consistently and cleanly applied as dry pads to a heat sink or component surface. With light clamping pressure, they will readily conform to both mating surfaces.

Standard THERMFLOW products are electrically non-conductive, however metal-to-metal contact is possible after the material undergoes phase-change, decreasing their electrical isolation properties. PC07DM-7 is the only THERMFLOW material recommended for use as a dielectric insulator.

Parker Chomerics offers two types of phase change materials—traditional thermal interface pads (PCM) and dual phase change polymer solder hybrids (PSH).

DUAL PHASE CHANGE POLYMER SOLDER HYBRID MATERIALS (PSH)

THERMFLOW brand products are also available as dual phase change polymer solder hybrid (PSH) thermal interface materials, in which case, both binder and filler change phases, to exhibit the lowest thermal impedance of the THERMFLOW family.

These thermal interface materials provide superior long term reliability performance. For optimum performance, THERMFLOW must be exposed to temperatures above 64°C during operation or by a burn-in cycle to achieve lowest thermal impedance and highest thermal performance.

TYPICAL APPLICATIONS

- Microprocessors
- Graphics processors
- Chipsets
- Memory modules
- Power modules
- Power semiconductors

APPLICATION

Material may flow when oriented vertically, especially at higher temperatures. This does not affect thermal performance, but should be considered if appearance is important.

CLEAN UP

THERMFLOW material can be removed with solvents such as toluene, MEK or isopropyl alcohol.

THERMFLOW® Non-Silicone, Phase-Change Thermal Interface Pads

	Typical Properties	PC07DM-7	T710 with PSA	T725	T766/T766-06	T557	T558	T777	Test Method
Physical	Color	Pink	Light Gray/ Off-White	Pink	Purple/Gray Foil	Gray	Gray/Gray Foil	Gray	Visual
	Carrier	1 mil Polyester	2 mil Fiberglass	None - Free Film	1 mil Metal Foil	None - Free Film	1 mil Metal Foil	None - Free Film	--
	Standard Thicknesses*, in (mm)	0.007 (0.178)	0.0055 (0.138)	0.005 (0.125)	0.0035 (0.088) 0.006 (0.152)	0.005 (0.125)	0.0045 (0.115)	0.0045 (0.115)	ASTM D374
	Specific Gravity	1.1	1.15	1.1	2.6	2.4	3.65	1.95	ASTM D792
	Phase Transition Temperature, °C	55	45	55	55	45/62***	45/62***	45/62***	ASTM D3418
	Weight Loss, 125°C for 48 Hours	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	<0.5%	--
Thermal	Thermal Impedance @ 70°C, °C-in²/W (°C-cm²/W)	Minimum Bond-line Thickness	Minimum Bond-line Thickness @ 50°C	2.9 mil	Minimum Bond-line Thickness	Minimum Bond-line Thickness	Minimum Bond-line Thickness	Minimum Bond-line Thickness	ASTM D5470
	@ 10 psi (69 kPa) @ 25 psi (172 kPa) @ 50 psi (345 kPa)	0.35 (2.2) 0.30 (1.93) 0.28 (1.81)	0.23 (1.48) 0.16 (1.03) 0.12 (0.77)	0.11 (0.71) 0.06 (0.39) 0.04 (0.26)	0.15 (0.97) 0.09 (0.58) 0.06 (0.39)	0.02 (0.13) 0.015 (0.097) 0.008 (0.052)	0.03 (0.19) 0.013 (0.084) 0.0097 (0.06)	0.02 (0.13) 0.015 (0.097) 0.0055 (0.035)	
	Operating Temperature Range, °F (°C)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	-67 to 257 (-55 to 125)	--
Electrical	Volume Resistivity, ohm-cm	10^{14}	10^{14}	10^{14}	10^{14} Metal Foil*	Non conductive**	Non conductive**/ Metal Foil*	Non conductive**	ASTM D257
	Voltage Breakdown, kVac	5	N/A	N/A	N/A	N/A	N/A	N/A	ASTM D149
Regulatory	Flammability Rating	Not Tested	Not Tested	V-0	Not Tested	Not Tested	Not Tested	V-0	UL 94
	RoHS Compliant	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Chomerics Certification
	Shelf Life, months from date of shipment	12	12	12	12	12	12	12	Chomerics

* Phase-change material exhibits 10^{14} ohm-cm volume resistivity. Metal foil is electrically conductive.
** The phase-change material is electrically non-conductive. However, as it contains dispersed solder for enhanced thermal properties, it can exhibit through-conductivity at thinner bond line thickness (approximately <2 mils). It should not be used as an electrical insulator.
*** The lower phase-transition temperature is for the polymer. The higher value is for the low melting alloy filler.