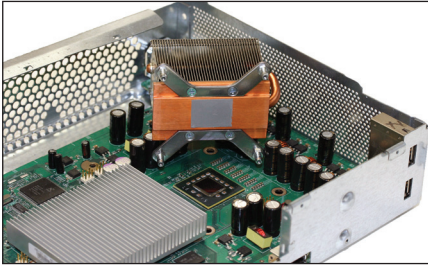


## Non-Silicone, Phase-Change Thermal Interface Pads

Completely fills interfacial air gaps and voids for best thermal performance



### Description

THERMFLOW® phase-change Thermal Interface Materials (TIMs) completely fill interfacial air gaps and voids. They also displace entrapped air between power dissipating electronic components. Phase-change materials are designed to maximize heat sink performance and improve component reliability.

Upon reaching the required melt temperature, the pad will fully change phase and attain minimum bond-line thickness (MBLT) - less than 0.001 inch or 0.0254mm, and maximum 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. THERMFLOW material softens as it reaches component operating temperatures. With light clamping pressure it will readily conform to both mating surfaces.

This ability to completely fill air gaps and voids typical of component packages and heat sinks allows THERMFLOW pads to achieve performance superior to any other thermal interface materials.

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 phase-change materials recommended for use as a dielectric insulator.

Chomerics offers two types of phase change materials—traditional thermal interface pads and Dual Phase Change Polymer Solder Hybrids.

### Dual Phase Change Polymer Solder Hybrid Materials

Dual Phase Change Thermal Interface Materials consist of binder and fillers which both phase-change to exhibit the lowest thermal impedance of the phase-change family.

These Thermal Interface Materials provide superior long term reliability performance.

For optimum performance, the pads 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.

### 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
- RoHS Compliant

### Typical Applications

- Microprocessors
- Graphics Processors
- Chipsets
- Memory Modules
- Power Modules
- Power Semiconductors

### Handling Information

These products are defined by Chomerics as “articles” according to the following generally recognized regulatory definition for articles:

An article is a manufactured item “formed to a specific shape or design during manufacturing,” which has “end use functions” dependent upon its size and shape during end use and which has generally “no change of chemical composition during its end use.”

In addition:

- There is no known or anticipated exposure to hazardous materials/substances during routine and anticipated use of the product.
- The product’s shape, surface, and design is more relevant than its chemical composition.

These materials are not deemed by Chomerics to require an MSDS. For further questions, please contact Chomerics at 781-935-4850.

### 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)<br>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              |
| Thermal                                                      | Weight Loss, 125°C for 48 Hours                                         | <0.5%                                    | <0.5%                                     | <0.5%                                     | <0.5%                                     | <0.5%                                         | <0.5%                                         | <0.5%                                          | --                      |
|                                                              | Thermal Impedance @ 70°C, °C-in <sup>2</sup> /W (°C-cm <sup>2</sup> /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                    | --                      |
|                                                              | @ 10 psi (69 kPa)<br>@ 25 psi (172 kPa)<br>@ 50 psi (345 kPa)           | 0.35 (2.2)<br>0.30 (1.93)<br>0.28 (1.81) | 0.23 (1.48)<br>0.16 (1.03)<br>0.12 (0.77) | 0.11 (0.71)<br>0.06 (0.39)<br>0.04 (0.26) | 0.15 (0.97)<br>0.09 (0.58)<br>0.06 (0.39) | 0.02 (0.13)<br>0.015 (0.097)<br>0.008 (0.052) | 0.03 (0.19)<br>0.013 (0.084)<br>0.0097 (0.06) | 0.02 (0.13)<br>0.015 (0.097)<br>0.0055 (0.035) | ASTM D5470              |
| Electrical                                                   | 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)                        | --                      |
|                                                              | Volume Resistivity, ohm-cm                                              | 10 <sup>14</sup>                         | 10 <sup>14</sup>                          | 10 <sup>14</sup>                          | 10 <sup>14</sup> Metal Foil*              | Nonconductive **                              | Nonconductive** / Metal Foil*                 | Nonconductive**                                | ASTM D257               |
| Regulatory                                                   | Voltage Breakdown (kVac)                                                | 5                                        | N/A                                       | N/A                                       | N/A                                       | N/A                                           | N/A                                           | N/A                                            | ASTM D149               |
|                                                              | 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<sup>14</sup> 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.

## TRADITIONAL PHASE CHANGE MATERIALS (PCM)

### PC07DM-7

- Utilizes proven T725 phase-change material
- Polyester dielectric layer offers excellent mechanical and electrical insulation properties
- Inherently tacky – no adhesive required
- Good thermal properties
- Tabs available for easy removal

### T710

- General use material
- Good thermal performance
- Low deflection force required
- Fiberglass provides dielectric standoff
- Only available with adhesive
- Tabs available for easy removal

### T725

- Excellent thermal performance
- Inherently tacky – no adhesive required
- Ideal for vertical applications
- Sticky nature limits flowing in vertical applications
- Tabs available for easy removal

### T766

- Excellent thermal performance
- Protective foil eliminates top liner
- Inherently tacky – no adhesive required
- Sticky nature limits flowing in vertical applications
- Also available at 0.006" thick

## POLYMER SOLDER HYBRID MATERIALS (PSH)

### T557

- Superior thermal performance
- For attachment remove white release liner first
- Dispersed solder filler offers added thermal performance
- Resin system designed for higher temperature reliability
- Inherently tacky – no adhesive required
- Tabs available for easy removal

### T558

- Superior thermal performance
- Conformal foil allows clean break/rework and eliminates top liner
- Dispersed solder filler offers added thermal performance

- Resin system designed for higher temperature reliability
- Inherently tacky – no adhesive required

### T777

- Superior thermal performance
- Ideal solution for mobile microprocessors
- Dispersed solder filler offers added thermal performance
- Resin system designed for higher temperature reliability
- Inherently tacky – no adhesive required
- Tabs available for easy removal

## Ordering Information

THERMFLOW materials are supplied in several standard formats (see part number guide below).

Custom die-cut shapes can also be provided on kiss-cut rolls by Chomerics' extensive network of distributor/ fabricators. To ease release liner removal, an optional tab can be added.

Standard tolerances for slitting widths and individually cut pieces are  $\pm 0.020$  inch ( $\pm 0.51$  mm).

### Part Number:

**6W**

**XX**

**YYYY**

**ZZZZ**

| 6W                                     | XX                                                        | YYYY                                                                           | ZZZZ                                                                    |
|----------------------------------------|-----------------------------------------------------------|--------------------------------------------------------------------------------|-------------------------------------------------------------------------|
| 4 = Roll stock                         | 10 = 100 ft.<br>40 = 400 ft.<br>XX = Custom length        | YYYY = Roll stock width:<br>Examples<br>0100 = 1"<br>0750 = 7.5"<br>2400 = 24" | ZZZZ = Material class<br>(T710, T725, T766, T557, T558, T777, PC07DM-7) |
| 6 = Roll stock with PSA<br>(T710 only) |                                                           |                                                                                |                                                                         |
| 9 = Custom die-cut part                | 11 = without PSA<br>12 = with PSA one side<br>(T710 Only) | Custom Part Number.<br>Contact Chomerics                                       |                                                                         |