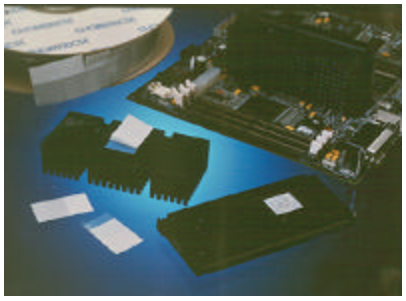
# Thermal Management Materials SELECTOR GUIDE

## Phase Change Thermal Interface Materials (THERMFLOW™)

| Material | Color | Thickness, in. (mm) | Fiberglass Reinforcing Carrier | PSA | Thermal Impedance | Comments |
|---|---|---|---|---|---|---|
| (1) T725 | Pink | 0.005 (0.13) | None | (2) NR | 0.03ºC-in²/W (@50 psi,70ºC) | Best thermal performance For high power microprocessors and power modules |
| T443 | Lt. Gray | 0.005 (0.13) | Yes | No | 0.10ºC-in²/W (@50 psi) | CPUs, Exposed die BGAs |
| T310 | Lt. Gray | 0.007 (0.18) | Yes | No | 0.17ºC-in²/W (@300 psi) | For DC/DC converters and power modules |
| T710 | Lt. Gray | 0.005 (0.13) | Yes | Yes | 0.18ºC-in²/W (@5 psi) | For microprocessors, power semis, ICs |



(1) US Patent No. 6,054,198

(2) NR=Not Required, material is inherently tacky.

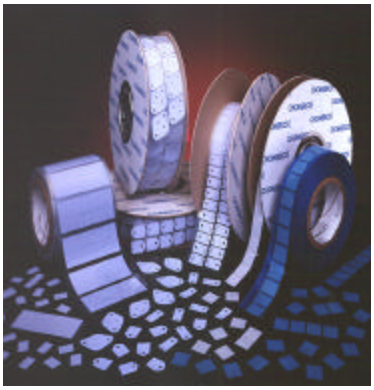
## Thermally Conductive Adhesive Tapes (THERMATTACH®)

| Material | Thickness In. (mm) | Thermal Impedance | Comments |
|---|---|---|---|
| T410 | 0.007 (0.18) | 1.10ºC-in²/W | Attaches heat sinks to plastic packages |
| T411 | 0.011 (0.28) | 1.00ºC-in²/W | Conforms to out-of-flat plastic packages |
| T404 | 0.005 (0.13) | 0.60ºC-in²/W | Kapton† carrier, electrically insulating |
| T405 | 0.006 (0.15) | 0.50ºC-in²/W | Aluminum carrier |
| T412 | 0.009 (0.23) | 0.25ºC-in²/W | Best thermal performance Expanded aluminum carrier |
| T413 | 0.007 (0.18) | 0.65ºC-in²/W | Ionically clean, Fiberglass reinforced |
| T414 | 0.005 (0.13) | 0.60ºC-in²/W | Ionically clean, Kapton† electr. insulating |

† Trademark of DuPont

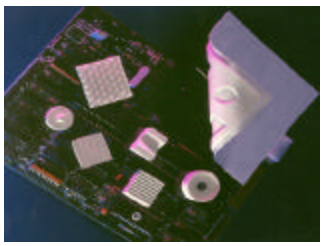
## Thermally Conductive Insulators (CHO-THERM®)

| Material | Dielectric Strength (VAC) | Color | Thickness In. (mm) | Thermal Impedance | Comments |
|---|---|---|---|---|---|
| T500 | 5,000 | Green | 0.010 (0.25) | 0.19ºC-in²/W | Best thermal performance |
| 1678 | 2,500 | Pink | 0.010 (0.25) | 0.20ºC-in²/W | Med. cost, high thermal performance |
| 1671 | 4,000 | White | 0.015 (0.38) | 0.23ºC-in²/W | High thermal performance & proven reliability in aerospace applications |
| T609 | 4,000 | Lt. Green | 0.009 (0.23) | 0.33ºC-in²/W | Intermediate performance |
| T444 | 5,000 | Beige | 0.003 (0.08) | 0.37ºC-in²/W | Non-silicone, Kapton† film |
| 1674 | 2,500 | Blue | 0.010 (0.25) | 0.40ºC-in²/W | General Purpose |
| 1680 | 6,000 | White/Gold | 0.007 (0.18) | 0.40ºC-in²/W | For use between SMT components and PCBs |
| T441 | 11,400 | Pink | (3) 0.013 (0.30) | 0.56ºC-in²/W | High dielectric at high humidity. Most economical. |



(3) Also available in 0.008 (0.20) and 0.018 (0.45) thicknesses.

## Thermally Conductive Gap Fillers (THERM-A-GAP™)



| Material | Carrier | Color | Hardness (Shore A) | Thickness Range | Thermal Cond. @10psi | Comments |
|---|---|---|---|---|---|---|
| G974 | Fiberglass 1-side | Blue | 35 | 0.010 (0.25) | 2.5 W/m-K | Highest thermal conductivity, For heat pipe assemblies and laptop PCs |
| 974 | None | | | 0.020 to 0.200 (5.08) | 6.0 W/m-K | |
| A574 | Aluminum | Lt. Gray | 5 | 0.020 (0.51) to 0.300 (7.62) | 1.6 W/m-K | Good combination of high thermal conductivity & softness |
| F574 | Int Fiberglass | | 5 | | 1.4 W/m-K | |
| A174 | Aluminum | Lt. Purple | 15 | 0.020 (0.51) to 0.300 (7.62) | 1.0 W/m-K | Low cost for auto elec, computers Available in custom molded shapes |
| T174 | Ext Cho-Therm | | | | | |
| F174 | Int Fiberglass | | 15 | | | |
| G174 | Fiberglass 1-side | | | | | |
| A274 | Aluminum | Green | 15 | 0.020 (0.51) to 0.300 (7.62) | 0.9 W/m-K | Ribbed sheets avail for better compliancy Molded shapes also available |
| T274 | Ext Cho-Therm | | | | | |