# 3M™ Thermally Conductive Epoxy Adhesive TC-2707

## Product Description

3M™ Thermally Conductive Epoxy Adhesive TC-2707 is an aluminum metal filled, two-part, thermally conductive epoxy adhesive.

## Key Features

- Improved thermal conductivity.
- Curing performance comparable to 3M™ Scotch-Weld™ Epoxy Adhesive DP-460 and DP-460 EG.
- Low outgassing comparable to Scotch-Weld DP-460 EG.
- Lower chloride ion content than standard epoxies.

## Typical Uncured Properties

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| Product | | 3M™ Thermally Conductive Epoxy Adhesive TC-2707 |
|---|---|---|
| **Viscosity** | **Base**<br>**Accelerator**<br>**Mixed** | 170,000 cps<br>25,000 cps<br>100,000 cps |
| **Base Resin** | **Base**<br>**Accelerator** | Epoxy<br>Amine |
| **Filler** | **Aluminum** | 50% by weight |
| **Mix Ratio (B:A)** | **Volume**<br>**Weight** | 2:1<br>2.00 : 0.96 |
| **Worklife** | | 60 minutes at 72°F (23°C) |

## Typical Cured Properties

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

| Product | 3M™ Thermally Conductive Epoxy Adhesive TC-2707 |
|---|---|
| **Color** | Gray |
| **Shore D Hardness** | 84 |
| **Glass Transition Temperature** | 60°C (tan delta) See Chart on page 3 |
| **Thermal Coefficient of Expansion** | 56 x $10^{-6}$/°C (below $T_g$)<br>132 x $10^{-6}$/°C (above $T_g$) |
| **Thermal Conductivity** | 0.72 W/m-°K |
| **Thermal Impedance** | 3.51 x $10^{-5}$ $m^2$°K/W (1 mil) |
| **Volume Resistivity[1]** | 1.6 x $10^{11}$ ohm-cm |
| **Total Outgassing** | <25 micro-gm/gm (GC/MS, 85°C/3 hours) |
| **Hydrocarbon Outgassing** | <25 micro-gm/gm (GC/MS, 85°C/3 hours) |
| **Siloxane Outgassing** | <2 micro-gm/gm (GC/MS, 85°C/3 hours) |
| **Extractable Siloxane** | <10 micro-gm/gm (hexane extraction) |
| **Extractable Chloride** | <10 micro-gm/gm (hexane extraction) |

[1)] As the 3M™ Thermally Conductive Epoxy Adhesive TC-2707 uses aluminum metal fillers, under certain end use application conditions the effective resistivity and/or effective dielectric strength could be significantly lower than noted. If the metal fillers are “trapped” or “pinched” between two surfaces, an electrical bridge path via the aluminum fillers could occur between these surfaces. Epoxy Adhesive TC-2707 is not suggested for applications where a powered electrical circuit is used or where a reliable volume resistivity and/or dielectric strength is desired. 3M™ Thermally Conductive Epoxy Adhesive TC-2810 uses a ceramic filler and is a suggested product to test for these type of application performance needs.

## Curing

**Cure Schedule:** 23°C/24 hours
50°C/270 minutes
70°C/90 minutes
90°C/30 minutes
120°C/10 minutes

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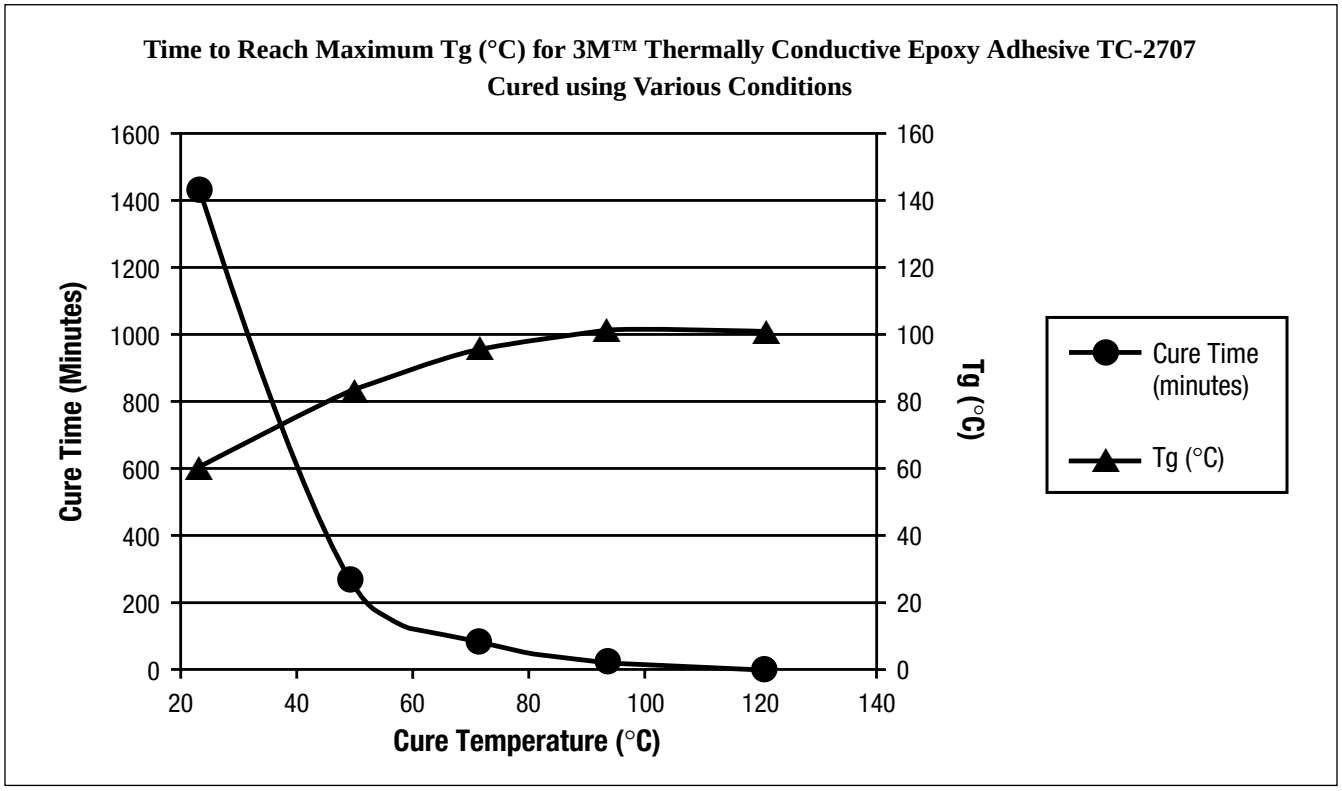
**Shear Strength, Peel Strength, Tg vs. Cure Temperature/Time**

| | 72°F (23°C) 24 hours | 122°F (50°C) 270 minutes | 158°F (70°C) 90 minutes | 194°F (90°C) 30 minutes | 248°F (120°C) 10 minutes |
|---|---|---|---|---|---|
| **Overlap Shear (psi) (ASTM D-1002)** | >3000 | >3000 | >3000 | >4000 | >4000 |
| **T-Peel (piw) (ASTM D-1876)** | >7 | >7 | >7 | >7 | >7 |
| **Tg (°C) Tan Delta** | 60 | 83 | 95 | 100 | 100 |
| **Tg (°C) Storage Modulus** | 48 | 73 | 85 | 86 | 89 |



# 3M™ Thermally Conductive Epoxy Adhesive TC-2707

## General Information

Product selection table for 3M™ Thermally Conductive Materials.

| Product | Thickness (mm) | Bulk Thermal Conductivity (W/m-K) | Typical Applications |
|---|---|---|---|
| **3M™ Thermally Conductive Tapes** | | | |
| **8805** | 0.127 | 0.6 | Applications requiring thin bonding with good thermal transfer; CPU, flex circuit and power transformer bonding to heat sinks and other cooling devices. Superior tack and wetting properties. |
| **8810** | 0.25 | | |
| **8815** | 0.375 | | |
| **8820** | 0.50 | | |
| **9889FR** | 1.0 | 0.5 | Applications requiring gap filling and bonding with good thermal transfer; plasma display, IC packages and PCB bonding to heat sinks, metal cases and other cooling devices. |
| **3M™ Thermally Conductive Pads** | | | |
| **5516/5516S** | 0.5, 1.0, 1.5, 2.0 | 2.3 | Applications requiring gap filling and superior thermal performance without bonding. IC package and PCB thermal interfacing with heat sinks or other cooling devices and metal cases. |
| **5519/5519S** | 0.5, 1.0, 1.5, 2.0 | 4.3 | |
| **5591S** | 0.5, 1.0, 1.5, 2.0 | 1.0 | |
| **5592/5592S** | 0.5, 1.0, 1.5, 2.0 | 1.1 | |
| **5595/5595S** | 0.5, 1.0, 1.5, 2.0 | 1.6 | |
| **3M™ Thermally Conductive Pads (Acrylic)** | | | |
| **5598H** | 1.0, 1.5 | 2.0 | These pads use an acrylic elastomer for applications that require a non-silicone thermal pad. Provides IC package and PCB thermal interfacing with heat sinks or other cooling devices, and metal cases. |
| **5590H** | 0.5, 1.0, 1.5 | 3.0 | |
| **3M™ Thermally Conductive Epoxy Adhesives** | | | |
| **TC-2810** | — | 1.0 | Applications requiring high adhesive strength, good surface wet-out, gap filling and good thermal transfer. Provides IC package and PCB thermal interfacing with heat sinks or other cooling devices. |
| **DP-190 Gray** | — | 0.4 | |

Only the “S” versions are available in 0.5 mm thicknesses.

“S” designation signifies a polyester film on one side to provide a non-tacky surface.

“H” designation signifies a product with one one-tacky surface without the use of PET film.

## Storage and Shelf Life

**Storage:** Store 3M™ Thermally Conductive Epoxy Adhesive TC-2707 at 60-80°F (15-27°C) or refrigerate for maximum shelf life and to reduce filler settling.

**Shelf Life:** Epoxy Adhesive TC-2707 has a shelf life of 12 months after date of shipment in its original container.

## Precautionary Information

Refer to Product Label and Material Safety Data Sheet for health and safety information before using this product. For additional health and safety information, call 1-800-364-3577 or (651) 737-6501.

## For Additional Information

To request additional product information or to arrange for sales assistance, call toll free 1-800-251-8634. Address correspondence to: 3M Electronics Markets Materials Division, Building 21-1W-10, 900 Bush Avenue, St. Paul, MN 55144-1000. Our fax number is 651-778-4244 or 1-877-369-2923. In Canada, phone: 1-800-364-3577. In Puerto Rico, phone: 1-787-750-3000. In Mexico, phone: 52-70-04-00.

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