

Thermal Management Solutions
for LED Assembly

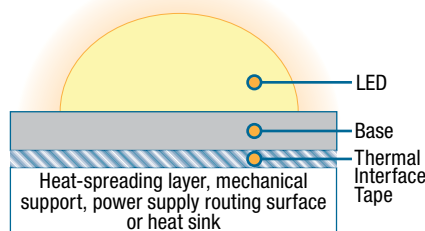
A woman with long brown hair, wearing a teal tank top and light grey pants, is sitting cross-legged and smiling while holding a black laptop. The background is a collage of electronic components, including a green power button icon, a red LED component, and various circuit boards with glowing green and red LEDs.

More
Light
Less
Heat

High performance
cooling – for a
new generation of
high-intensity LEDs

3M

Cooling off an LED

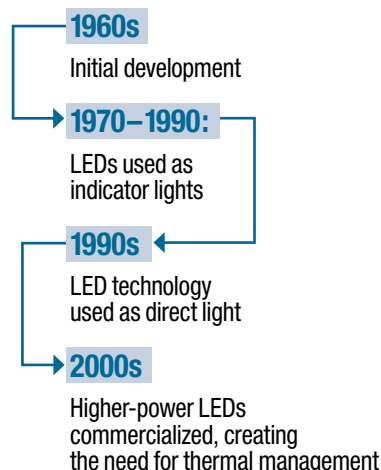


Durability of interface: Especially in external applications of LEDs, durability of the thermal interface is important to support efficiency in different environmental conditions. 3M products have shown excellent durability through accelerated aging tests.

Advanced designs drive need for more efficient cooling

- High speed/multi-function components > More heat generated
- Smaller enclosures > No room for heat to dissipate

The evolution of LED technology



Turn up the lights...turn down the heat

In recent years, advances in technology have led to a new generation of LEDs offering longer life, increased brightness and lower power consumption. Because of their relatively low cost and improved efficiency, LEDs are replacing traditional incandescent, fluorescent, and halogen lighting in many electronics applications.

An emerging need for thermal management

Today's high intensity LEDs are opening up new opportunities for cost savings and reduced power consumption; however, they also generate more heat than conventional LEDs. It's important to remember that the higher the temperature at which LEDs operate, the less efficient they become—making improved thermal management essential for optimal performance. That's where we can help.

3M™ Thermal Interface Materials provide efficient thermal transfer for long-term reliability and performance optimization in applications using high brightness LEDs. 3M Thermal Interface Materials have a proven track record of durability and high thermal performance in a variety of environmental conditions to meet the demanding needs of applications today and in the future. 3M provides a full selection of products to meet customer's process and performance requirements, including thermally conductive pads, adhesives, and greases.

3M™ Thermal Interface Materials

| Product | 3M ID # | Description | Features |
|--|---|--|---|
| 3M™ Thermally Conductive Interface Pads | 5570 (1.3 W/m-K) 5589H (Softer) 5590H (Higher thermal conductivity) | Acrylic pads, 0.5 mm and thicker | High Thermal Conductivity Excellent Gap Filling Die cut to size and shape No Silicone oil breeding/contamination |
| | 5515-20 5515-25 *S version is also available | Silicone pad, thin and higher K | Higher thermal conductivity (3 W/m-K) Thin thickness (0.2 mm - 0.25 mm) S version : One side is laminated with thin film for better handling and converting |
| 3M™ Thermally Conductive Interface Tapes | 8805 8810 8815 8820 | Acrylic double-sided tapes, 0.5 mm and thinner | High adhesion Die cut to size and shape Excellent wet-out |
| | TM-670SA TM-671SA TM-672SA | | High adhesion Differentiated adhesion for rework |
| | 8940 8943 | | Higher thermal conductive (0.9 W/m-K) Thin thickness (0.19 mm) 8943 is single side tape (0.17 mm) |
| | 8910-03 | | Very high adhesion for narrow bonding area |
| 3M™ Thermally Conductive Epoxy Adhesives | TC-2810 TC-2707 | Epoxy adhesives | Ultra-thin bond line Higher thermal conductivity than tape Higher shear, peel strength than tape |
| 3M™ Thermally Conductive Grease | TCG-2033 TCG-2037 | Non-silicone greases | Thin bond line offers low impedance Screen-printable version available Ultra-high performance |

Some products may not be available in your country or region. Please contact your local 3M representative for product support.

* For applications using a thermal pad, the 3M Acrylic Thermal pads are slightly tacky on one side for generally acceptable assembly adhesion in many applications. If higher adhesion is desired, 3M suggests the testing of the 3M™ Acrylic Adhesive Transfer Tape 9461.

The tack adhesion strength of the 3M Thermal Pads is sufficient for holding the product in place for assembly and use, etc. in many applications. The end use design of the LED Structure/Thermal Pad/Heat Sink does require an added mechanical means of assembly to ensure long term mechanical integrity and thermal performance.

3M also offers a line of silicone based thermal pads ranging in thermal conductivity from 1.0 W/m-K to 4.9 W/m-K. Please contact 3M for additional product information and inquire about 3M™ Thermally Conductive Interface Pads 5591(S), 5592(S), 5595(S), 5516(S) and 5519(S).

Important Notice: Before using this product, you must evaluate it and determine if it is suitable for your intended application. You assume all risks and liability associated with such use.

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