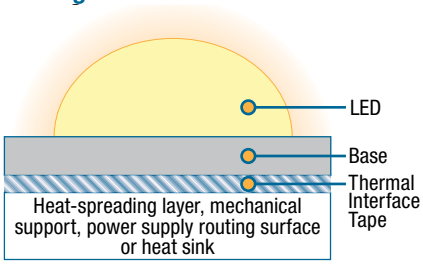
Thermal Management Solutions
for LED Assembly

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

1960s
Initial development

1970–1990:
LEDs used as indicator lights

1990s
LED technology used as direct light

2000s
Higher-power LEDs commercialized, creating the need for thermal management

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 3M 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 customers' 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. **Note:** 5589H is not available for 0.5 mm.	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	8904-02 8904-025 8904-05	Acrylic adhesive tapes with thin PET carrier	Higher thermal conductivity (1.5 W/m-K) Reworkable UL 94 V-0
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
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

Note: 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).

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

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