

Thermal Management Solutions  
for LED Applications

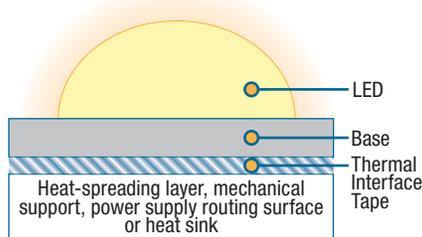


# Beat the Heat

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

**3M**

### Cooling off an LED

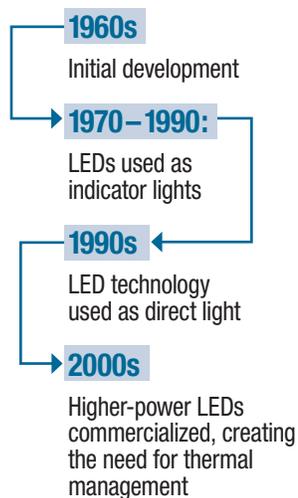


**Durability of interface:** Especially in external applications of LEDs, durability of the thermal interface is important to support efficiency in different environmental conditions. 3M products have shown excellent durability through accelerated aging tests.

### 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 Pads*	5590H (higher thermal conductivity) 5589H (softer)	Acrylic pads, 0.5mm and thicker	High Thermal Conductivity Excellent Gap Filling Die cut to size and shape
3M™ Thermally Conductive Tapes	8805 8815 8810 8820	Acrylic double-sided tapes, 0.5mm and thinner	High adhesion Die cut to size and shape Excellent wet-out
3M™ Thermally Conductive 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

\* 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/mK to 4.1 W/mK. Please contact 3M for additional product information and inquire about 3M™ Thermally Conductive Pads 5591s, 5592, 5595, 5516 and 5519.

**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.

**Warranty; Limited Remedy; Limited Liability:** 3M's product warranty is stated in its Product Literature available upon request. 3M MAKES NO OTHER WARRANTIES INCLUDING, BUT NOT LIMITED TO, ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. If this product is defective within the warranty period stated above, your exclusive remedy shall be, at 3M's option, to replace or repair the 3M product or refund the purchase price of the 3M product. Except where prohibited by law, 3M will not be liable for any indirect, special, incidental or consequential loss or damage arising from this 3M product, regardless of the legal theory asserted.



**Electronics Markets Materials Division**  
3M Center, Building 225-3S-06  
St. Paul, MN 55144-1000  
www.3M.com/electronics  
1-800-251-8634

Please recycle. Printed in USA.  
© 3M 2009. All rights reserved.  
Issued: 10/09 7024(HB)  
60-5002-0431-2

3M is trademark of 3M Company.  
Used under license by 3M subsidiaries and affiliates.