3M™ Thermal Management Solutions for LED Assembly
Electronics Materials Solutions Division
November 2016
High performance cooling for a new generation of high-intensity LEDs

Cooling off an LED

LED
Base
Thermal Interface Tape
Heat-spreading layer, mechanical support, power supply routing surface or heat sink

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

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3M™ Thermal Management Solutions
High intensity LEDs require improved thermal management for optimal performance

• Efficient thermal transfer for long-term reliability and performance optimization in applications using high brightness LEDs
• Proven track record of durability through accelerated aging tests
  – *Especially in external applications of LEDs, durability of the thermal interface is important to support efficiency in different environmental conditions*
• High thermal performance in a variety of environmental conditions to meet the demanding needs of applications today and in the future

Full selection of products to meet your process and performance requirements:
• 3M™ Thermally Conductive Interface Pads
• 3M™ Thermally Conductive Interface Tapes
• 3M™ Thermally Conductive Adhesives
• 3M™ Thermally Conductive Greases
## 3M™ Thermal Management Materials

Product portfolio for LED assembly applications

<table>
<thead>
<tr>
<th>Product Category</th>
<th>Product Number</th>
<th>Description</th>
<th>Features</th>
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</thead>
<tbody>
<tr>
<td>3M™ Thermally Conductive Interface Pads</td>
<td>5570N (1.3 W/m-K)</td>
<td>Acrylic pads, 0.5 mm and thicker*</td>
<td>High thermal conductivity, Excellent gap filling, Die cut to size and shape, No silicone oil breeding / contamination</td>
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<tr>
<td></td>
<td>5589H (Softer)</td>
<td>*Note: 5589H is not available for 0.5 mm.</td>
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<td>5590H (Higher thermal conductivity)</td>
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<td>5515-20</td>
<td>Silicone pad, thin and higher K</td>
<td>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</td>
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<td>5515-25 (S version is also available)</td>
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<tr>
<td>3M™ Thermally Conductive Interface Pads</td>
<td>8926-02 (0.20 mm)</td>
<td>Acrylic adhesive tapes with thin PET carrier</td>
<td>Higher thermal conductivity (1.5 W/m-K), Reworkable</td>
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<td>8926-025 (0.25 mm)</td>
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<td>8926-05 (0.50 mm)</td>
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<tr>
<td>3M™ Thermally Conductive Interface Tapes</td>
<td>8805</td>
<td>Acrylic double-sided tapes, 0.5 mm and thinner</td>
<td>High adhesion, Die cut to size and shape, Excellent wet-out</td>
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<td>8810</td>
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<tr>
<td>3M™ Thermally Conductive Epoxy Adhesives</td>
<td>TC-2810</td>
<td>Epoxy adhesives</td>
<td>Ultra-thin bond line, Higher thermal conductivity than tape, Higher shear, peel strength than tape</td>
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<td>TC-2707</td>
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