3M™ Thermally Conductive Acrylic Interface Pad 5500H

Product Description
3M™ Thermally Conductive Acrylic Interface Pad 5500H is designed to provide a preferential heat transfer path between heat generating components, for example, integrated circuit (IC) chips or electric vehicles batteries and heat spreaders such as aluminum heat sinks. 3M pad 5500H consists of a highly conformable slightly tacky acrylic elastomeric sheet filled with conductive ceramic particles.

Key Features
- Easy handling
- High conformability even for non-flat IC surfaces and automotive batteries
- Good flame retardancy, UL 94 V-0 rating
- No siloxane gas / oil bleeding, which often causes electric connection failure
- Soft compliant material allows for pressure relaxation, preventing high pressure zones on components
- Good electrical insulation properties
- Slight tack allows pre-assembly. Good wettability for better thermal conductivity

Product Construction/Material Description
Note: The following technical information and data should be considered representative or typical only and should not be used for specification purposes.

<table>
<thead>
<tr>
<th>3M™ Thermally Conductive Acrylic Interface Pad 5500H</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>White with light gray dots</td>
</tr>
<tr>
<td>Base resin</td>
<td>Acrylic</td>
</tr>
<tr>
<td>Pad thickness</td>
<td>0.5, 1.0, 1.5, 2.0 (thicker pads available upon request)</td>
</tr>
<tr>
<td>Primary filler type</td>
<td>Ceramic</td>
</tr>
<tr>
<td>Product liner</td>
<td>PET film</td>
</tr>
</tbody>
</table>

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Applications
- Heat transfer in consumer electronics and automotive electronic products
- Decrease of compression stress to electronic parts by thermal pad softness
Examples:
  - Heat transfer between PCB and heat sink
  - Thermal management in automotive batteries
  - Power electronics component thermal management
  - Chip on film (COF) heat conduction
  - LED thermal management
**3M™ Thermally Conductive Acrylic Interface Pad 5500H**

- HDTV IC chip
- General gap filling in electronic devices

**Application Techniques**

**Note:** Be sure to follow manufacturer’s safety precautions and directions for use when using solvents.

Substrate surfaces should be clean and dry prior to the thermal pad application to ensure best thermal performance. A clean surface can improve the thermal performance of an application.

- Isopropyl alcohol (2-propanol) applied with a lint-free wipe or swab should be adequate for removing surface contamination such as dust or fingerprints. Do not use “denatured alcohol” or glass cleaners, which often contain oily components. Allow the surface to dry for several minutes before applying the thermal pad. More aggressive solvents (such as acetone, methyl ethyl ketone (MEK) or toluene) may be required to remove heavier contamination (grease, machine oils, solder flux, etc.) but should be followed by a final isopropanol wipe as described above.
- Apply the thermal pad to one substrate at a modest angle with the use of a squeegee, rubber roller or finger pressure to help reduce the potential for air entrapment under the thermal pad during its application.
- Remove the release liner before application.
- Assemble the part by applying compression to the substrates. This will ensure a good wetting of the substrate surfaces with the thermal pads. Rigid substrates are more difficult to assemble without air entrapment as most rigid parts are not flat. Flexible substrates can be assembled to rigid or flexible parts with much less concern about air entrapment because one of the flexible substrates can conform to the other substrates during application.

**Typical Physical Properties and Performance Characteristics**

**Note:** The following technical information and data should be considered representative or typical only and should not be used for specification purposes. Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is provided once the product is approved by 3M for general commercialization and development work is completed.

<table>
<thead>
<tr>
<th><strong>3M™ Thermally Conductive Acrylic Interface Pad 5500H</strong></th>
<th><strong>Property</strong></th>
<th><strong>Method</strong></th>
<th><strong>Typical Value</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Thermal conductivity (W/mK)</strong></td>
<td>3M method*1</td>
<td>3.0</td>
<td></td>
</tr>
<tr>
<td><strong>Thermal conductivity (W/mK)</strong></td>
<td>ASTM 5470</td>
<td>2.0</td>
<td></td>
</tr>
<tr>
<td><strong>Hardness (Shore 00)</strong></td>
<td>Asker C</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Shore 00</td>
<td>65</td>
<td></td>
</tr>
<tr>
<td><strong>Flammability</strong></td>
<td>UL94</td>
<td>V-0</td>
<td></td>
</tr>
<tr>
<td><strong>Dielectric Strength (kV/mm)</strong></td>
<td>ASTM D149</td>
<td>18</td>
<td></td>
</tr>
<tr>
<td><strong>Volume Resistivity (Ω-cm)</strong></td>
<td>ASTM D149</td>
<td>$15 \times 10^{12}$</td>
<td></td>
</tr>
<tr>
<td><strong>Operating Temperature Range</strong></td>
<td>3M test method</td>
<td>110-130°C</td>
<td></td>
</tr>
</tbody>
</table>

*Note: Tolerances of 1 mm and 1.5 mm = +/-10%, 0.5 mm +/- 0.1 mm.

*1Method listed as modified ASTM 5470. Sample thickness are 2-8mm. Sample size is 33mm Ø. Pressure condition is 200Kpa

*2File QMFZ2.E176845
Heat Resistance
3M™ Thermal Conductive Acrylic Interface Pad 5500H has high temperature (130°C durability). Samples that are aged for 2,000 hours at 130°C ambient temp show no significant change in thermal conductivity or hardness.

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Storage and Shelf Life
Product shelf life is 12 months from date of manufacture when stored in the original packaging materials and stored between 15°C and 30°C and between 20% and 70% relative humidity. With long storage time, the material may yellow, and yellowing should be allowable. Additionally, liner release force can increase with time and impact the product converting and/or ease of liner removal.
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Certificate of Analysis (COA)
The 3M Certificate of Analysis (COA) for this product is established when the product is commercially available from 3M. The commercially available product will have a COA specification established. The COA contains the 3M specifications and test methods for the products performance limits that the product will be supplied against. The 3M product is supplied to 3M COA test specifications and the COA test methods. Contact your local 3M representative for this product’s COA.

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Final product specifications and testing methods will be outlined in the products Certificate of Analysis (COA) that is shipped with the commercialized product.

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