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## 3M™ Thermally Conductive Acrylic Interface Pad 5590PI

### Product Description

3M™ Thermally Conductive Acrylic Interface Pad 5590PI is designed to provide a preferential heat transfer path between heat generating components like integrated circuit chip, LED lighting and heat spreaders. 3M pad 5590PI consists of a highly conformable slightly tacky acrylic elastomer sheet filled with conductive ceramic particles.

### Key Features

- Flame retardant, UL 94 V-0
- No silicone/siloxane gas, which can cause electric connection failure
- Good softness and conformability even to non-flat IC surfaces
- Incorporates a thin polyimide film for good handling
- Good thermal conductivity, heat resistance and electrical insulation properties
- Slight tack allows pre-assembly
- Good wettability for better thermal conductivity

## 3M™ Thermally Conductive Acrylic Interface Pad 5590PI

|  |
|--|
| <b>Polyimide</b>   |
| <b>Thermally conductive acrylic<br/>conformable elastomer (low tack)</b> |
| <b>Film Liner</b>  |

### 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.

| <b>3M™ Thermally Conductive Acrylic Interface Pad 5590PI</b> |                   |
|--|-------------------|
| <b>Property</b>  | <b>Value</b>      |
| <b>Color</b>   | Brown/White       |
| <b>Base Resin</b>  | Acrylic Elastomer |
| <b>Thickness</b>   | 0.2 mm            |
| <b>Liner Type</b>  | PET               |

### Applications

- IC packaging heat conduction
- Heat sink
- Chip on film (COF) thermal management for uniform temperature
- LED board thermal interface management
- LED TV driver IC Chip
- General gap filling in electronic device
- Electric vehicle/hybrid battery for automotive

# 3M™ Thermally Conductive Acrylic Interface Pad 5590PI

## Application Techniques

- Substrate surfaces should be clean and dry prior to pad application. Isopropyl alcohol (isopropanol) applied with a lint free wipe or swab should be adequate for removing surface contamination such as dust or finger prints. Do not use “denatured alcohol” or glass cleaners which often contain oily components. Allow the surface to dry for several minutes before applying the 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.
- Be sure to read and follow the manufacturers’ precautions and directions when using primers and solvents.
- For best product performance, it is important to use recommended pressure and time conditions to achieve as much wetting as possible.
- Ideal application temperature range is from 0°C to 40°C. Initial application to surfaces at temperatures below 30°C is not recommended because the pad becomes too firm to be wetted readily. However, once properly applied, low temperature performance is generally satisfactory.

## 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 shipped with the commercialized product.

| 3M™ Thermally Conductive Acrylic Interface Pad 5590PI |                     |                        |
|---|---------------------|------------------------|
| Property  | Method <sup>a</sup> | Value <sup>b</sup>     |
| Density (g/cm <sup>3</sup> )                          | 3M test method      | 2.0                    |
| Dielectric strength (kV)                              | JIS K6911           | 8                      |
| Thermal conductivity (W/m · k)                        | 3M test method      | 3.0                    |
| Thermal impedance (°C · cm <sup>2</sup> /W)           | 3M test method      | 5.1                    |
| Thermal impedance (°C · inch <sup>2</sup> /W)         | 3M test method      | 0.79                   |
| Flammability  | UL 94               | V-0                    |
| Hardness  | Asker C             | 30                     |
|   | Shore 00            | 60                     |
| Volume resistivity (Ω-cm)                             | JIS K6249           | 2.7 x 10 <sup>12</sup> |

<sup>a</sup>Contact your local 3M representative for more information on the 3M test methods used

<sup>b</sup>Measurement value of the acrylic elastomer

## Heat Resistance<sup>c,d</sup>

| 3M™ Thermally Conductive Acrylic Interface Pad 5590PI |         |           |           |           |
|---|---------|-----------|-----------|-----------|
| Duration (hrs)  | Initial | 500       | 1000      | 2000      |
| Hardness (Asker C)                                    | 30      | 33        | 33        | 34        |
| Appearance  | -       | No effect | No effect | No effect |

<sup>c</sup>Acrylic elastomer aged by dwelling at 110°C high temperature chamber

<sup>d</sup>The end use customer application, design and verification testing will determine the final in-use effective temperature range based on each application’s environmental conditions

## Storage and Shelf Life

The shelf life of 3M™ Thermally Conductive Acrylic Interface Pad 5590PI is 12 months from the date of manufacture when stored in the original packaging materials and stored at 21°C (70°F) and 50% relative humidity.

# 3M™ Thermally Conductive Acrylic Interface Pad 5590PI

## 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.

This technical data sheet may contain preliminary data and may not match the COA specification limits and/or test methods that may be used for COA purposes.

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

Safety Data Sheet: Consult Safety Data Sheet before use.

Regulatory: For regulatory information about this product, contact your 3M representative.

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