P-THERM® Thermal Interface Materials

Polymer Science offers a complete thermal management product line. Our P-THERM® thermal interface materials are designed to efficiently and effectively aid in the conduction of heat to meet the growing thermal management requirements of today’s advanced electronic designs.

P-THERM® Advantages

- Improved Material Yield
- Consistent High Quality
- Strong Technical Support
- Custom Web Coating
  - Thickness
  - Width
  - Color

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Polymer Science offers a variety of thermally conductive gap filler materials in many formats including silicone, non-silicone, pads, putty and dispensable. P-THERM® Gap Filler materials offer a range of thermal conductivities, hardnesses and thicknesses.

<table>
<thead>
<tr>
<th>Material Number &amp; Description</th>
<th>Color</th>
<th>Thermal Conductivity</th>
<th>Durometer (Shore 00)</th>
<th>Thickness Range (Typical)</th>
<th>Flammability Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-1511 hyper-soft silicone based gap filler</td>
<td>Gray</td>
<td>1.0 W/m K</td>
<td>5</td>
<td>0.5mm - 5.0mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1513 hyper-soft silicone based gap filler</td>
<td>Green</td>
<td>3.0 W/m K</td>
<td>20</td>
<td>0.5mm - 5.0mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1541 ultra-soft silicone based gap filler</td>
<td>Gray</td>
<td>1.0 W/m K</td>
<td>5</td>
<td>0.5mm - 5.0mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1543 ultra-soft silicone based gap filler</td>
<td>Green</td>
<td>3.0 W/m K</td>
<td>35</td>
<td>0.25mm - 5.0mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1593 ultra-soft silicone gap filler</td>
<td>Green</td>
<td>3.0 W/m K</td>
<td>35</td>
<td>0.25mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-2512 soft silicone gap filler</td>
<td>Purple</td>
<td>1.8 W/m K</td>
<td>25</td>
<td>0.5mm - 5.0mm</td>
<td>N/A</td>
</tr>
<tr>
<td>PS-2543 soft silicone gap filler with polyurethane face</td>
<td>Green</td>
<td>3.0 W/m K</td>
<td>47</td>
<td>0.5mm - 5.0mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-2563 soft silicone gap filler coated with acrylic adhesive</td>
<td>Green</td>
<td>3.0 W/m K</td>
<td>35</td>
<td>0.5mm - 5.0mm</td>
<td>V-0</td>
</tr>
</tbody>
</table>

*V-0 based on internal test methods

sales@polymerscience.com  +1.888.533.7004  www.polymerscience.com
P-THERM® thermally conductive Phase Change Materials perform like thermal grease with the convenience of a thermal pad. At 55°C materials begin to soften and flow, filling in irregular areas of the thermal interface surfaces reducing the natural thermal resistance. They are made of a non-silicone polymer blend. The material is tacky, making it easy to convert and place into the electrical assembly.

<table>
<thead>
<tr>
<th>Material Number &amp; Description</th>
<th>Color</th>
<th>Thermal Conductivity</th>
<th>Phase Change Temperature</th>
<th>Thickness Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-1595 tacky phase change</td>
<td>Yellow</td>
<td>4.0 W/m K</td>
<td>55°C</td>
<td>0.1mm - 0.5mm</td>
</tr>
<tr>
<td>PS-1596 tacky phase change on PI carrier</td>
<td>Yellow</td>
<td>4.0 W/m K</td>
<td>55°C</td>
<td>0.1mm - 0.5mm</td>
</tr>
</tbody>
</table>
Proper heat dissipation is critical in today’s compact electronic devices. P-THERM® Heat Spreaders allow for quick dissipation of heat in the x-y direction. Thermally conductive Acrylic PSA secures the thin conductive heat spreader material to the heat source for efficient heat dissipation.

<table>
<thead>
<tr>
<th>Material Number &amp; Description</th>
<th>Color</th>
<th>Thermal Conductivity (x-y axis)</th>
<th>Support Substrate</th>
<th>Thickness</th>
<th>Adhesive Peel Strength (to SUS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-1520 aluminum foil with naturally tacky non-silicone coating</td>
<td>White</td>
<td>1.0 W/m K</td>
<td>N/A</td>
<td>0.10mm - 0.25mm</td>
<td>N/A</td>
</tr>
<tr>
<td>PS-1673 copper foil with non-conductive acrylic adhesive</td>
<td>Copper</td>
<td>&gt;200 W/m K</td>
<td>Rolled Copper Foil</td>
<td>0.04mm</td>
<td>&gt;600 g/25mm</td>
</tr>
<tr>
<td>PS-1677 aluminum foil with conductive acrylic PSA</td>
<td>Aluminum</td>
<td>&gt;100 W/m K</td>
<td>Aluminum Foil</td>
<td>0.04mm</td>
<td>&gt;600 g/25mm</td>
</tr>
<tr>
<td>PS-1678 copper foil and graphite hybrid</td>
<td>Copper/Black</td>
<td>&gt;550 W/m K</td>
<td>Copper Foil/Synthetic Graphite</td>
<td>0.125mm</td>
<td>N/A</td>
</tr>
<tr>
<td>PS-1679 copper foil and graphite hybrid with conductive acrylic adhesive</td>
<td>Copper/Black</td>
<td>&gt;550 W/m K</td>
<td>Copper Foil/Synthetic Graphite</td>
<td>0.15mm</td>
<td>1800 g/25mm</td>
</tr>
<tr>
<td>PS-1681 copper foil with conductive black nano-thermal diffusion coating</td>
<td>Black</td>
<td>&gt;400 W/m K</td>
<td>Copper Foil/Conductive Fabric</td>
<td>0.08mm</td>
<td>&gt;1000 g/25mm</td>
</tr>
<tr>
<td>PS-1688 aluminum foil with conductive acrylic PSA</td>
<td>Gray</td>
<td>100 W/m K</td>
<td>Aluminum Foil</td>
<td>0.045mm</td>
<td>&gt;1000 g/25mm</td>
</tr>
<tr>
<td>PS-1692 copper heat spreader with conductive acrylic PSA</td>
<td>Copper</td>
<td>100 W/m K</td>
<td>Copper Foil</td>
<td>0.06mm</td>
<td>800 g/25mm</td>
</tr>
</tbody>
</table>
All P-THERM® tapes and adhesives offer reliable adhesion and conductive properties at continuous high temperatures. Transfer adhesives, double and single-faced tapes are available.

<table>
<thead>
<tr>
<th>Material Number &amp; Description</th>
<th>Color</th>
<th>Thermal Conductivity</th>
<th>Adhesive Peel Strength (to SUS)</th>
<th>Total Thickness</th>
<th>Flammability Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-0266 thermally conductive PSA</td>
<td>White</td>
<td>0.55 W/m K</td>
<td>2270 g/25mm</td>
<td>0.05mm</td>
<td>V-0*</td>
</tr>
<tr>
<td>PS-1651 thermally conductive PSA coated to aluminum</td>
<td>White</td>
<td>0.55 W/m K</td>
<td>2270 g/25mm</td>
<td>0.15mm</td>
<td>V-0*</td>
</tr>
<tr>
<td>PS-1652 thermally conductive PSA coated to fiberglass</td>
<td>White</td>
<td>0.55 W/m K</td>
<td>2270 g/25mm</td>
<td>0.25mm</td>
<td>V-0*</td>
</tr>
<tr>
<td>PS-1656 double coated thermally conductive acrylic adhesive</td>
<td>White</td>
<td>0.8 W/m K</td>
<td>1850 g/25mm</td>
<td>0.13mm</td>
<td>V-0*</td>
</tr>
<tr>
<td>PS-1659 double coated thermally conductive acrylic adhesive on fiberglass</td>
<td>White</td>
<td>≥0.8 W/m K</td>
<td>≥1200 g/25mm</td>
<td>0.25mm</td>
<td>V-0*</td>
</tr>
</tbody>
</table>

*V-0 based on internal test methods*
P-THERM® ECIs offer good dielectric and thermally conductive properties without the worry of flow or mess associated with thermal grease. The natural tack of the materials mitigate movement during assembly.

<table>
<thead>
<tr>
<th>Material Number &amp; Description</th>
<th>Color</th>
<th>Thermal Conductivity</th>
<th>Dielectric Breakdown Strength</th>
<th>Total Thickness</th>
<th>Flammability Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>PS-1522 non-silicone dielectric pad coated onto PET</td>
<td>White</td>
<td>0.4 W/m K</td>
<td>&gt;5000 Vac</td>
<td>0.1mm - 0.25mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1523 thermally conductive PSA coated to polyimide film</td>
<td>Gold</td>
<td>0.75 W/m K</td>
<td>&gt;5000 Vac</td>
<td>0.1mm - 0.25mm</td>
<td>V-0</td>
</tr>
<tr>
<td>PS-1524 thermally conductive PSA coated to fiberglass</td>
<td>White</td>
<td>0.7 W/m K</td>
<td>&gt;5000 Vac</td>
<td>0.25mm</td>
<td>V-0</td>
</tr>
</tbody>
</table>
Other Product Material Offerings

Polymer Science offers the following range of products under its brands:

**P-DERM®**
- Silicone Gel Adhesives
- Hydrogels
- Acrylics
- PSAs
- Hydrophilic Coatings
- Urethanes

**P-SHIELD®**
- Fabrics
- Foam Multi-laminates
- Foils
- Films
- Tapes and Adhesives
- Sputtered Films

**General Industrial**
- Release Liners
- Films
- Transfer Adhesives
- Double and Single Coated PSAs
Company Overview

Polymer Science has been coating materials since 1998 serving the medical device and electronic industries worldwide. Our strengths include high quality products, strong technical support and commitment to our customers. Suzhou Polymer Science was formed in 2012 to satisfy the growing need for our support and quality in our Asian markets. Polymer Science expanded once again in 2014 when our Polymer Science Europe office opened in Bremen, Germany to better serve our European markets. Our diverse team of engineers and technical staff, along with our state of the art equipment, provide the capabilities necessary to develop a quality custom adhesive or coated material consistent with application requirements from anywhere in the world.

Locations

Global Headquarters
Polymer Science, Inc. (HQ)
Monticello, IN

Polymer Science Europe
Polymer Science Europe GmbH
Bremen, Germany

Suzhou Polymer Science
Suzhou Polymer Science Advanced Materials Co., Ltd.
Shengpu Town, SIP Suzhou China

Sales Office
Chicago, IL
Toll-Free: +1 888 533 7004
Phone: +1 574 583 3751
Fax: +1 574 583 3984

Sales Office
San Francisco, CA
Toll-Free: +1 888 533 7004
Phone: +1 574 583 3751
Fax: +1 574 583 3984

Liaison Office
Polymer Science Co., Ltd.
Gyeonggi-do, Republic of Korea
Phone: +82 10 5400 7933

Specific tests should be performed by the end user on materials listed in this catalog in order to determine the product suitability for the particular application.

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sales@polymerscience.com
+1.888.533.7004
www.polymerscience.com