Tgon™ 9000
High Thermal Conductive Graphite Sheet
Preliminary

HIGH THERMAL CONDUCTIVE GRAPHITE SHEET
Tgon™ 9000 is a synthetic graphite thermal interface material consisting of carbon in-plane mono-crystal structure.
Tgon™ 9000 is ultra-thin, light-weight, flexible and offers excellent in-plane thermal conductivity. Ideal for variety of heat spreading applications where in-plane thermal conductivity dominates and limited spaces.

FEATURES AND BENEFITS
- Thermal Conductivity: 500 to 1900W/mK
- 4 times thermal conductivity than copper
- Reduce hot spots and protect sensitive areas
- Enables slim device designs with ultra-thin of 17µm
- Light weight with density of 2.05~2.25 Sg/cm³ for thickness of 17um & 25um
- Flexible (Withstand more than 10,000 times bending with R=5mm)
- Ease of manufacturing for high volume production

MARKETS
- Handheld devices
- Mobile computing
- Display
- Lighting
- Telecom

PRODUCT NAME AND KEY PROPERTIES AS BELOW:

<table>
<thead>
<tr>
<th>Product Name</th>
<th>Test Method</th>
<th>Tgon 9017</th>
<th>Tgon 9025</th>
<th>Tgon 9040</th>
<th>Tgon 9070</th>
<th>Tgon 9090</th>
</tr>
</thead>
<tbody>
<tr>
<td>Thickness (mm)</td>
<td>ASTM D374</td>
<td>0.0174+/-.0005</td>
<td>0.025+/-.0005</td>
<td>0.04+/-.0005</td>
<td>0.07+/-.001</td>
<td>0.1+/-.001</td>
</tr>
<tr>
<td>Thermal conductivity (W/mK)</td>
<td>ASTM E1461</td>
<td>1500~1900</td>
<td>1500~1700</td>
<td>1150~1400</td>
<td>700~1000</td>
<td>500~700</td>
</tr>
<tr>
<td>Thermal diffusivity (cm²/s)</td>
<td>ASTM E1461</td>
<td>15</td>
<td>15</td>
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<td>15</td>
</tr>
<tr>
<td>Density (g/cm³)</td>
<td>ASTM D792</td>
<td>9</td>
<td>9</td>
<td>8</td>
<td>7</td>
<td>7</td>
</tr>
<tr>
<td>Specific heat (J/gK)</td>
<td>ASTM E1269</td>
<td>2.05~2.25</td>
<td>2.05~2.25</td>
<td>1.65~1.85</td>
<td>1.6~1.3</td>
<td>0.7~1.0</td>
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<tr>
<td>Specific heat (J/gK)</td>
<td>ASTM E1269</td>
<td>0.85</td>
<td>0.85</td>
<td>0.85</td>
<td>0.85</td>
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<tr>
<td>Heat resistance (°C)</td>
<td>Over 100 hours of testing</td>
<td>400</td>
<td>400</td>
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<td>400</td>
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<tr>
<td>Extensional strength (MPa)</td>
<td>ASTM F152</td>
<td>9</td>
<td>28</td>
<td>23</td>
<td>20</td>
<td>19.2</td>
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<tr>
<td>Bending test (mm)</td>
<td>ASTM E2176</td>
<td>10,000 or more</td>
<td>10,000 or more</td>
<td>10,000 or more</td>
<td>10,000 or more</td>
<td>10,000 or more</td>
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<tr>
<td>Electric conductivity (S/cm)</td>
<td>ASTM E1269</td>
<td>20,000</td>
<td>20,000</td>
<td>20,000</td>
<td>96,000</td>
<td>96,000</td>
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</tbody>
</table>

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CLV-customerservice@lairdtech.com
www.lairdtech.com/thermal
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Preliminary

PRODUCT STRUCTURE
- There are two types of product structure as follows:
  - Tgon™9000 series: Tgon™9000 sheet only
  - Tgon™9000PA series: Tgon™9000 with one-side PET film & one-side adhesive

Below is the product structures available:

<table>
<thead>
<tr>
<th>Type</th>
<th>Graphite Only</th>
<th>Laminated (Insulation &amp; Adhesive)</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Tgon 9000 series</td>
<td>Tgon 9000PA series</td>
</tr>
</tbody>
</table>

**Structure**

**Features**

Graphite Sheet

With PET film & Adhesive

**Thickness**

Graphite: 17µm, 25µm, 40µm, 70µm, 100µm

PET film: 5µm, 10µm

Adhesive: 5µm, 10µm, 30µm

Graphite: 17µm, 25µm, 40µm, 70µm, 100µm

**Standard Size**

180 x 220mm

180 x 220mm

**Die-cut edge options:**

<table>
<thead>
<tr>
<th>Type</th>
<th>Flash Edge</th>
<th>Envelope Seal</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Tgon 9000PA series</td>
<td>Tgon 9000EPA series</td>
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</table>

**Structure**

**PART NUMBER INFORMATION**

<table>
<thead>
<tr>
<th>Tgon 9000 PA</th>
<th>1010</th>
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</thead>
<tbody>
<tr>
<td>Product Code</td>
<td></td>
</tr>
</tbody>
</table>

**Graphite Thickness**

17-> 17µm
25-> 25µm
40-> 40µm
70-> 70µm
100-> 100µm

**Structure & Edge Options**

PA Laminated with PET & Adhesive with flash edge

EPA Laminated with PET & Adhesive with envelope seal

**PET Thickness**

05-> 5µm
10-> 10µm
30-> 30µm

**Adhesive Thickness**

05-> 5µm
10-> 10µm
30-> 30µm