Aluminum Bonding Ribbon for Power Electronics

Heraeus Aluminum Bonding Ribbon – maintaining the strength of Heraeus Bonding Wire materials and outperforming the technical feasibilities in power electronics assembly.

The increasing demands for transmitting high currents in electronic power devices have driven the industry to investigate alternative interconnect solutions.

Ultimate reliability and extreme robustness, together with improvements in productivity are always considered to be the main objectives of technical enhancements.

Heraeus' Aluminum Ribbons for power applications provide an evolutionary extension to its well proven thick aluminum wire program – utilizing the strength of thick wire technology for ribbon products.

For the demands in fulfilling high electrical load requirements in today's power devices, the aluminum thick wire bonding has its limitations, e.g. once it becomes necessary to bond a significant number of parallel wires.

In such cases, Heraeus Aluminum Bonding Ribbon can be an alternative. Due to ribbon’s larger cross-section compared to wire, Heraeus Aluminum Bonding Ribbon can carry higher currents.

The idea behind using Heraeus Aluminum Bonding Ribbon for interconnect purposes is to give up some of the overall flexibility of Aluminum wire bonding, in order to gain a one dimensional interconnect design with at least comparable or even better reliability and the potential of higher electrical performance.

Benefits of Heraeus Aluminum Ribbon

- High electrical loads
- High reliability
- Corrosion resistant
- A significant number of wires replaced by one ribbon
- Saves space and time in electronic housing concepts
- Softest bonding with ribbon
- Potential for higher manufacturing yields
- Bondable on all common surfaces that are applicable for Al bonding
Quality and consistency of the alloys used in manufacture of Heraeus’ Aluminum Bonding Ribbons is an important factor to achieve best reliability and robustness.

Heraeus decided to transfer the advantages of its enhanced Aluminum materials, already successfully in use in today’s automotive electronic devices, to Aluminum Ribbon manufacture.

The material compositions and mechanical properties are equivalent to those of aluminum wires.

In order to satisfy the requirements on the dimensional tolerances, Heraeus is using a fully computer controlled rolling equipment.

<table>
<thead>
<tr>
<th>Al Ribbon Size</th>
<th>Microns (µm)</th>
<th>Mil</th>
<th>8</th>
<th>10</th>
<th>12</th>
<th>15</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>40 x 4</td>
<td>1000 x 100</td>
<td></td>
<td>3.2</td>
<td>2.0</td>
<td>1.4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>60 x 8</td>
<td>1500 x 200</td>
<td></td>
<td>9.5</td>
<td>6.1</td>
<td>4.2</td>
<td>2.7</td>
<td>1.5</td>
</tr>
<tr>
<td>80 x 8</td>
<td>2000 x 200</td>
<td></td>
<td>12.7</td>
<td>8.1</td>
<td>5.7</td>
<td>3.6</td>
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<td>19.1</td>
<td>12.2</td>
<td>8.5</td>
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<td>3.1</td>
</tr>
</tbody>
</table>

Alternative dimensions on request

The descriptions and engineering data shown here have been compiled by Heraeus using commonly-accepted procedures, in conjunction with modern testing equipment, and have been compiled as according to the latest factual knowledge in our possession. The information was up-to-date as of this document was printed (latest versions can always be supplied upon request). Although the data is considered accurate, we cannot guarantee accuracy, the results obtained from its use, or any implied infringement resulting from its use (this is contractually and explicitly agreed to in writing, in advance). The data is supplied on the condition that the user shall conduct tests to determine materials suitability for particular application.

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