Starting Formulation

SF 4029 One-Package Temperature Adhesive 828 One-Package High Temperature Adhesive
EPON™ Resin 828

Introduction
This one-package adhesive, properly formulated, can yield a pot life of approximately one year at 25 °C. It exhibits high tensile shear strength at temperatures from -57 °C to 149 °C. Test data projects compliance with the requirements of military specification MIL-A-8623, Type III Adhesive.

Suggested Uses
Primarily applications which require retention of adhesive properties at elevated temperatures up to 149 °C (300 °F), especially with metals, ceramics and high performance composite materials.

Features
- Long shell life, approximately one year at 25 °C
- High tensile shear strengths over a wide temperature range, -7 to 149 °C
- Properly formulated, should meet requirements for military specification MIL-A-8623, Type III Adhesive

Formula

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>EPON Resin 828</td>
<td>Hexion</td>
<td>100.00</td>
<td>10.31</td>
</tr>
<tr>
<td>Dicyandiamide</td>
<td>SKW Corp.</td>
<td>10.00</td>
<td>0.86</td>
</tr>
<tr>
<td>Bentone 27</td>
<td>Rheox, Inc.</td>
<td>5.00</td>
<td>0.35</td>
</tr>
<tr>
<td>Methanol</td>
<td>Hoechst Celanese Corp.</td>
<td>1.67</td>
<td>0.25</td>
</tr>
<tr>
<td>Aluminum Powder #120</td>
<td>Reynolds Metals Co.</td>
<td>50.00</td>
<td>2.22</td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>166.67</td>
<td>13.99</td>
</tr>
</tbody>
</table>

Mixing Instructions
Prewet Bentone 27 with methanol. Combine all materials and pass three times over a three roll mill.

Typical Handling Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Viscosity</td>
<td>Thixotropic Paste</td>
<td>11.91</td>
</tr>
<tr>
<td>Density</td>
<td>lbs/gal</td>
<td>11.91</td>
</tr>
<tr>
<td>Expected Pot Life at 25 °C</td>
<td>yrs</td>
<td>1</td>
</tr>
<tr>
<td>Cure Schedule</td>
<td></td>
<td>1 hr @ 149°C</td>
</tr>
</tbody>
</table>

Application
Surfaces to be bonded should be free of dirt, oil, grease, and other contaminants. The best cleaning procedures for metals are sandblasting and acid etching. For many applications vapor degreasing is the only practical method. Coat surfaces to be bonded.

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and press together lightly; contact pressure is sufficient to develop maximum bond strength. Cure the adhesive for a minimum of one hour at 149 °C. Shorter cure periods at temperatures of up to 204 °C can also be employed.

Table 2 / Adhesive Properties

<table>
<thead>
<tr>
<th>Test Temperature</th>
<th>Type Break</th>
<th>Tensile Shear Strength</th>
</tr>
</thead>
<tbody>
<tr>
<td>-57 °C</td>
<td>Cohesive</td>
<td>2,600</td>
</tr>
<tr>
<td>25 °C</td>
<td>Cohesive</td>
<td>2,900</td>
</tr>
<tr>
<td>82 °C</td>
<td>Cohesive</td>
<td>3,340</td>
</tr>
<tr>
<td>149 °C</td>
<td>Cohesive/Adhesive</td>
<td>1,050</td>
</tr>
</tbody>
</table>

Values were obtained using acid-etched aluminum coupons and a cure schedule of one hour at 149°. Higher strengths would be expected on a cure schedule of one hour at 177 °C. The data meets the requirements for a Type III Adhesive under Military Specification MIL-A-8623. Tensile shear specimens heat aged 200 hours at 149 °C exhibit no significant loss of bond strength.

Storage Recommendations regarding storage conditions can be obtained by visiting our web site at www.hexion.com

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