Starting Formulation

SF 7012

General Purpose Electrical Potting Compound

EPON™ Resin 828

Introduction

This general purpose electrical potting compound provides good mechanical, thermal and electrical properties while curing at moderate temperatures, 90-150 °C. Polyethylene glycol is used to impart a degree of thermal shock resistance to the cured system.

Formula

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Resin Portion</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPON Resin 828</td>
<td>Hexion</td>
<td>75.0</td>
<td>7.74</td>
</tr>
<tr>
<td>Carbowax 600</td>
<td>Union Carbide Corp.</td>
<td>25.0</td>
<td>2.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>100.0</td>
<td>10.41</td>
</tr>
</tbody>
</table>

Converter Portion

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hexahydrophthalic Anhydride</td>
<td>Anhydrides &amp; Chemicals, Inc.</td>
<td>51.5</td>
<td>4.50</td>
</tr>
<tr>
<td>Chlorendic Anhydride</td>
<td>Jonas Chemical Corp.</td>
<td>51.5</td>
<td>3.46</td>
</tr>
<tr>
<td>DMP-10</td>
<td>Rohm &amp; Haas Co.</td>
<td>2.0</td>
<td>0.24</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td>105.0</td>
<td>8.20</td>
</tr>
</tbody>
</table>

Table 1 / Handling Properties

<table>
<thead>
<tr>
<th>Properties</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resin/Converter Combining Ratio</td>
<td>by weight</td>
<td>0.95 : 1</td>
</tr>
<tr>
<td></td>
<td>by volume</td>
<td>1.27 : 1</td>
</tr>
<tr>
<td>Viscosity at 23 °C</td>
<td>cP</td>
<td>24,000</td>
</tr>
<tr>
<td>Density</td>
<td>lbs/gal</td>
<td>11.0</td>
</tr>
<tr>
<td>Pot Life at 23 °C</td>
<td>hrs</td>
<td>8-10</td>
</tr>
</tbody>
</table>

Compounding Procedure

Combine the hexahydrophthalic anhydride (HHPA) and chlorendic anhydride using agitation. Sparge with dry inert gas, if possible, so that hydrolysis of anhydride is minimized. During agitation, heat the mixture to 90 °C. Add DMP-10 and hold the converter blend until a clear solution is attained. Cool the converter to 40 °C or less and then add it to a thoroughly mixed blend of EPON Resin 828 and Carbowax 600. Continue agitation until the resin and the converter are thoroughly mixed.

This potting compound is useable for 8 to 10 hours if it is stored at room temperature. Filler loadings of 100 to 200 parts per hundred resin can be incorporated if the formula is to be used at elevated temperatures. Suitable fillers include silicas, aluminas, talcs and calcium carbonate.
The unit to be potted is placed in the mold and heated to 90-120 °C. The compound is poured into the mold. If necessary, entrapped air is removed by vacuum.

This formulation may be cured overnight at 90 °C, in 3-4 hours at 120 °C, or 1 hour at 150 °C. Large castings should be cured at the lowest temperature. Silicone mold releases, such as Dow-Corning Compound Number 7 are the most effective.

Typical Cured State Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength, Ultimate</td>
<td>psi</td>
<td>10,600</td>
</tr>
<tr>
<td>Tensile Elongation at Break</td>
<td>%</td>
<td>5.25</td>
</tr>
<tr>
<td>Flexural Strength, Ultimate</td>
<td>psi</td>
<td>19,100</td>
</tr>
<tr>
<td>Compressive Strength, Ultimate</td>
<td>psi</td>
<td>16,500</td>
</tr>
<tr>
<td>Izod Impact, notched</td>
<td>ft•lbf/inch</td>
<td>0.473</td>
</tr>
<tr>
<td>Hardness</td>
<td>Rockwell M</td>
<td>104</td>
</tr>
<tr>
<td>Water Absorption, 24 hours</td>
<td>%</td>
<td>0.18</td>
</tr>
<tr>
<td>Weight Loss, 24 hours at 150 °C</td>
<td>%</td>
<td>0.5</td>
</tr>
</tbody>
</table>

Electrical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dielectric Constant, at 10^6 Hertz</td>
<td></td>
<td>3.56</td>
</tr>
<tr>
<td>Dielectric Strength</td>
<td>volts/mil</td>
<td>479</td>
</tr>
</tbody>
</table>

Storage

Recommendations regarding storage conditions can be obtained by visiting our web site at [www.hexion.com](http://www.hexion.com)

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Safety, Storage & Handling

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