Starting Formulation

SF 7013
Flexible Electrical Potting Compound
EPON™ Resin 828

Introduction This general purpose electrical potting compound illustrates the use of polyethylene glycol to improve flexibility with minimal sacrifice in mechanical, thermal and electrical properties. Phthalic anhydride, used as the converter, provides acceptable cured state properties at a relatively low cost.

<table>
<thead>
<tr>
<th>Formula</th>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Part A</td>
<td>EPON Resin 828</td>
<td>Hexion</td>
<td>65.0</td>
<td>6.72</td>
</tr>
<tr>
<td></td>
<td>Carbowax 600</td>
<td>Union Carbide Corp.</td>
<td>35.0</td>
<td>3.72</td>
</tr>
<tr>
<td></td>
<td>Total Part A</td>
<td></td>
<td>100.0</td>
<td>10.45</td>
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</tbody>
</table>

Part B

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Phthalic Anhydride</td>
<td>USS Chemicals Div., United States Steel</td>
<td>50.00</td>
<td>3.94</td>
</tr>
<tr>
<td>DMP-10</td>
<td>Rohm &amp; Haas Co.</td>
<td>0.26</td>
<td>0.03</td>
</tr>
<tr>
<td>Total Part B</td>
<td></td>
<td>50.25</td>
<td>3.97</td>
</tr>
</tbody>
</table>

Compounding Procedure
Resin Portion – Blend Carbowax 600 and EPON Resin 828. If necessary, fillers such as silica or alumina can be incorporated into the resin portion.

Converter Portion – Phthalic anhydride is added to the mixed resin portion. Sparging with dry inert gas during this step will minimize the hydrolysis of anhydride. Heat the mixture to 99 °C to dissolve all the anhydride. Add the DMP-10 and continue stirring until a clear solution (unfilled systems) is attained. Maintain the temperature of the compound above 93 °C to prevent phthalic anhydride from precipitating prior to use. The finished compound can be stored at room temperature for two weeks. If crystallization of phthalic anhydride occurs, stir the compound and heat to 93 °C.

Typical-Handling Properties Table 1 / Handling and Reactivity

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Resin/Converter Combining Ratio
- by weight: 2 : 1
- by volume: 2.63 : 1

Viscosity at 90 °C: cP
- 18

Density: lbs/gal
- 10.4

Pot Life at 25 °C: weeks
- 1-2

Application: A typical cure schedule is 3 hours at 120 °C. Also, acceptable cures are achieved overnight at 90 °C or in one hour at 150 °C. Large castings should be cured at the lowest temperature. Increasing or decreasing the amount of DMP-10 will shorten or lengthen, respectively, the time necessary for complete cure. Adjustments to the DMP-10 level will also affect the pot life.

The material to be potted is placed in the mold and heated to the desired cure temperature. The potting compound is then poured into the mold and vacuum desired, if necessary, to eliminate voids. Silicone mold releases such as Dow-Corning Compound Number 7 are the most effective.

<table>
<thead>
<tr>
<th>Typical Cured State Properties</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile Strength</td>
<td>psi</td>
<td>7,215</td>
</tr>
<tr>
<td>Tensile Elongation at Break</td>
<td>%</td>
<td>8.5</td>
</tr>
<tr>
<td>Initial Flexural Modulus</td>
<td>ksi</td>
<td>170</td>
</tr>
<tr>
<td>Izod Impact, notched</td>
<td>ft•lb/inch</td>
<td>1.64</td>
</tr>
<tr>
<td>Hardness</td>
<td>Shore D</td>
<td>77</td>
</tr>
<tr>
<td>Water Absorption, 24 hours</td>
<td>%</td>
<td>0.71</td>
</tr>
<tr>
<td>Weight Loss, 24 hours at 150 °C</td>
<td>%</td>
<td>0.56</td>
</tr>
</tbody>
</table>

Electrical Properties

Dielectric Constant $^2$
- 4.01

Dissipation Factor $^2$
- 0.036

Volume Resistivity $^3$
- at 25 °C: ohm•cm, $2.7 \times 10^{14}$
- at 66 °C: ohm•cm, $7.7 \times 10^{11}$
Surface Resistivity at 25 °C

1 Cured for 3 hours at 120 °C.
2 Measured at 25 °C, 50% R. H. and 106 Hertz.
3 Measured at 50% R. H., 500 volts for 1 minute.

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

General Information

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Safety, Storage & Handling

Please refer to the MSDS for the most current Safety and Handling information.

Contact Information

For product prices, availability, or order placement, please contact customer service:

www.hexion.com/ContactUs/

For literature and technical assistance, visit our website at: www.hexion.com