Starting Formulation

SF 7015

Epoxy Mass Casting Binder
EPON™ Resin 828 / EPIKURE™ Curing Agent 3061

Introduction
This epoxy system is formulated for use as a binder in casting compounds capable of application and cure in unusually large mass sizes with minimal exotherm and shrinkage. Typical of such applications is the casting of large tooling parts, flotation devices and the filling/sealing of large downhole excavations.

Suggested Uses
- Molded parts such as sand-core boxes for foundry work, pipe fitting, cases, and housings
- Electrical insulation such as transformer bushings for interior service

Features
- When filled with selected low specific heat inerts, such as metallic powder or tabular alumina, resulting compounds are characterized by the following performance highlights:
  - Cured at 23 °C
  - Peak exotherm of <65 °C
  - Minimal shrinkage
  - Demold capability after 24 hours cure

Formula

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>Resin Portion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPON Resin 828</td>
<td>Hexion</td>
<td>100.0</td>
<td>10.36</td>
</tr>
<tr>
<td>Converter Portion</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>EPIKURE Curing Agent 3061</td>
<td>Hexion</td>
<td>55.0</td>
<td>7.00</td>
</tr>
<tr>
<td>Nonylphenol</td>
<td>Borg-Warner Chemicals</td>
<td>27.0</td>
<td>3.36</td>
</tr>
</tbody>
</table>

Typical 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>100 : 82</td>
</tr>
<tr>
<td></td>
<td>by volume</td>
<td>1 : 1</td>
</tr>
<tr>
<td>Gel Time at 23 °C, one pint mass</td>
<td>hrs</td>
<td>2</td>
</tr>
<tr>
<td>Peak Exotherm, one pint mass</td>
<td>°C</td>
<td>115</td>
</tr>
</tbody>
</table>

Typical Cured State Properties

| Properties                | Units | Value |

© and ™ Licensed trademarks of Hexion Inc.

DISCLAIMER

The information provided herein was believed by Hexion Inc. (“Hexion”) to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. All products supplied by Hexion are subject to Hexion’s terms and conditions of sale. HEXION MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY HEXION, except that the product shall conform to Hexion’s specifications. Nothing contained herein constitutes an offer for the sale of any product.
Heat Deflection Temperature  °C  54
Tensile Strength  psi  5900
Tensile Elongation  %  2.7
Flexural Strength  psi  9850

Compressive Strength, Ultimate  psi  17200
Compressive Strength, Yield  psi  8300
Izod Impact, notch  ft•lb/in  0.24
Water Absorption, 96 hours at 23 °C  %  0.42

Compounding  Mix the resin and converter portions and blend to a homogeneous state with proper agitation equipment prior to mixing with selected filler (sand, iron powder, or -8 mesh tabular alumina). Filler contents should be maximized when casting extraordinarily large masses. The peak exotherm is inversely proportional to the amount of filler used, but a peak exotherm temperature of 40-65 °C is necessary to ensure proper cure development and minimal shrinkage.

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

General Information  These are starting formulations and are not proven in the user’s particular application but are simply meant to demonstrate the efficacy of the products and to assist in the development of the user’s own formulation. It is the user’s responsibility to fully-test and qualify the formulation, along with the ingredients, methods, applications or equipment identified herein (“Information”), by the user’s knowledgeable formulator or scientist, and to determine the appropriate use conditions and legal restrictions, prior to use of any Information.

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

Exposure to these materials should be minimized and avoided, if feasible, through the observance of proper precautions, use of appropriate engineering controls and proper personal protective clothing and equipment, and adherence to proper handling procedures. None of these materials should be used, stored, or transported until the handling precautions and recommendations as stated in the Material Safety Data Sheet (MSDS) for these and all other products being used are understood by all persons who will work with them. Questions and requests for information on Hexion Inc. ("Hexion") products should be directed to your Hexion sales representative, or the nearest Hexion sales office. Information and MSDSs on non-Hexion products should be obtained from the respective manufacturer.

Contact Information  For product prices, availability, or order placement, please contact customer service:
www.hexion.com/Contacts/

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

® and ™ Licensed trademarks of Hexion Inc.

DISCLAIMER  The information provided herein was believed by Hexion Inc. ("Hexion") to be accurate at the time of preparation or prepared from sources believed to be reliable, but it is the responsibility of the user to investigate and understand other pertinent sources of information, to comply with all laws and procedures applicable to the safe handling and use of the product and to determine the suitability of the product for its intended use. All products supplied by Hexion are subject to Hexion’s terms and conditions of sale. Hexion MAKES NO WARRANTY, EXPRESS OR IMPLIED, CONCERNING THE PRODUCT OR THE MERCHANTABILITY OR FITNESS THEREOF FOR ANY PURPOSE OR CONCERNING THE ACCURACY OF ANY INFORMATION PROVIDED BY HEXION, except that the product shall conform to Hexion’s specifications. Nothing contained herein constitutes an offer for the sale of any product.