Starting Formulation

SF 6000

Epoxy Thin-Set Terrazzo Flooring
EPON™ Resin 828 / HELOXY™ Modifiers 505 and 8 / EPIKURE™ Curing Agent 3295

Introduction
A premium quality, flexibilized, thin-set terrazzo formulation offering all of the advantages associated with epoxy terrazzo as well as several improved features.

Features
- Permanent, high strength bonds to substrate
- Light weight at 1/4” thickness is important consideration in high rise buildings
- Can be ground after overnight cure, eliminating the 4 to 7 day delay in finishing cementitious terrazzo
- Matrix polishes to high gloss and resists staining more than cementitious terrazzo
- Tough, flexible matrix system – 18% ultimate tensile elongation
- No non-reactive, migrating extenders or diluents used
- High impact strength – >16 ft•lb
- Good air release characteristics
- Good color retention for epoxy compound

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>60</td>
<td>6.22</td>
</tr>
<tr>
<td>HELOXY Modifier 505</td>
<td>Hexion</td>
<td>35</td>
<td>4.12</td>
</tr>
<tr>
<td>HELOXY Modifier 8</td>
<td>Hexion</td>
<td>5</td>
<td>0.67</td>
</tr>
<tr>
<td>Titanium Dioxide R-101</td>
<td>Du Pont Co.</td>
<td>5</td>
<td>0.14</td>
</tr>
<tr>
<td>DC-200 Fluid, 100 centistokes grade</td>
<td>Dow-Corning Corp.</td>
<td>0.007</td>
<td>0.001</td>
</tr>
<tr>
<td>Total Resin Portion</td>
<td></td>
<td>105.007</td>
<td>11.151</td>
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Converter Portion

<table>
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<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
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<tbody>
<tr>
<td>EPIKURE Curing Agent 3295</td>
<td>Hexion</td>
<td>18</td>
<td>2.17</td>
</tr>
<tr>
<td>Total Converter Portion</td>
<td></td>
<td>18</td>
<td>2.17</td>
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</tbody>
</table>

Filler Portion

<table>
<thead>
<tr>
<th>Material</th>
<th>Supplier</th>
<th>Pounds</th>
<th>Gallons</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. 40-200 Marble Dust</td>
<td>Georgia Marble Co.</td>
<td>185</td>
<td>8.19</td>
</tr>
<tr>
<td>Thin-Set Marble Chip Blend</td>
<td>#0 &amp; #1 sizes Georgia Marble Co.</td>
<td>369</td>
<td>16.33</td>
</tr>
<tr>
<td>Total Filler Portion</td>
<td></td>
<td>554</td>
<td>24.52</td>
</tr>
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</table>

Typical Handling Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Density, Filled</td>
<td>lbs/gal</td>
<td>17.91</td>
</tr>
<tr>
<td>Density, Unfilled</td>
<td>lbs/gal</td>
<td>9.26</td>
</tr>
</tbody>
</table>
Viscosity at 25 °C, unfilled cP 880

Expected Working Life:
1 quart filled at 25 °C min 100
100 grams unfilled at 25 °C, minutes min 34

Combining Ratio (Resin Portion/Converter Portion) by weight 5.8 : 1
by volume 5.1 : 1

Compounding

The titanium dioxide or other selected pigment should be milled or sheared into a portion of the EPON Resin 828 using a 3-roll mill, Cowles Dissolver, or other suitable grinding equipment. This color paste is then combined with the remaining components of the resin portion and thoroughly blended. A drill press, Lighting Mixer or other blender can be used to provide a uniform mix.

Terrazzo mix designed for placement on vertical areas such as coves and risers must be made thixotropic to prevent sagging during cure. Cab-O-Sil M-5 silica (Cabot Corp.) in the amount of 3 to 6 phr can be incorporated either at the job site or it can be compounded into the resin portion beforehand. If the latter course is taken, the Cab-O-Sil should be mixed into the resin portion at 2400 RPM or faster for a period of 30-60 minutes to assure long term thixotropic stability.

The marble chips can be purchased in standard color and size blends or can be custom blended. The chips should be water washed to remove dust (especially when dark colors are used) and dried. The dust, if not removed, can color the pigmented matrix.

Application Instructions

The surface on which this compound is to be applied must be sound and free from dirt, grease, oil, wax, paint, laitance of new concrete and other contaminants. Concrete substrates can be prepared by either acid etching, scarifying, or sandblasting. If the terrazzo is to be applied over wooden floors, old paint and dirt are best removed by sanding down to clean wood. Plywood sheets should be firmly anchored over strip wood floors to minimize flexing of individual boards.

Metal divider strips are usually bonded to the floor in a block pattern to aid in screening the terrazzo mix to the proper thickness. In the cove area, one layer of glass cloth wetted with the unfilled binder portion of this formulation is lapped over the junction of floor and wall to prevent cracking due to building movement. A coating of a clear binder portion is then applied to the entire floor and cove area to assure good wetting of the substrate. This prime coat can be applied by brush, roller, or squeegee.

The terrazzo mix is prepared by first blending the resin and converter portions of this formulation in the designated combining ratio. A propeller shaped agitator powered by a drill motor is preferred to assure a uniform blend. The marble dust and chips are then mixed in with the aid of a small concrete mixer or KOL Mixal. Hand mixing in a wheelbarrow is sometimes used. CabO-Sil is often added at the job site to provide the degree of thixotropy required to hold the cove mix in place during cure.

The mix is then screened and troweled onto the floor to the proper thickness (usually 3/8") before the prime coat has cured. Grinding is accomplished with conventional terrazzo equipment, usually 16 to 48 hours after placement of the wet mix. Grinding proceeds more slowly with increasing cure time.

A grout coat is applied after the initial grinding to fill in any pin-holes, bubbles, and other imperfections exposed by the grinding. The pigmented and marble dust filled portion of this coat is normally applied by means of a rubber squeegee. The final grinding and polishing is then accomplished after the grout coat has cured overnight.

A thin seal coat of moisture curing polyurethane or acrylic lacquer followed by a wax completes the operation. The moisture curing polyurethane imparts notably improved mar resistance in comparison to the acrylic lacquer.

Typical Cured State Properties

Table 2 / Properties of Unfilled Epoxy Binder

<table>
<thead>
<tr>
<th>Units</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardness</td>
<td>Shore D 77</td>
</tr>
<tr>
<td>Ultimate Tensile Strength</td>
<td>psi 5,200</td>
</tr>
<tr>
<td>Tensile Elongation</td>
<td>% 18</td>
</tr>
<tr>
<td>Ultimate Flexural Strength</td>
<td>psi 8,500</td>
</tr>
</tbody>
</table>

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Revision:
### Initial Flexural Modulus

\[ \text{psi} \]
\[ 0.22 \times 10^6 \]

### Ultimate Compressive Strength

\[ \text{psi} \]
\[ 23,000 \]

### Linear Shrinkage\(^1\)

\[ \text{in./in.} \]
\[ 0.0052 \]

### Tabor Abrasion, loss per 1000 rev.

\[ \text{mg} \]
\[ 56.0 \]

### Coefficient of Linear Thermal Expansion

\[ \text{Temp. range: -25 to 60 °C} \]
\[ \text{in./in./ °C} \]
\[ 117 \times 10^6 \]

### Chemical Resistance

- **Distilled Water**: % 0.33
- **10% Hydrochloric Acid**: % 0.43
- **5% Acetic Acid**: % 1.16
- **30% Sulfuric Acid**: % 0.64
- **10% Sodium Hydroxide**: % 0.29
- **Isopropanol**: % 1.09
- **Ethanol**: % 4.14
- **Mineral Oil**: % 0.05
- **1% Detergent Solution**: % 0.37

\(^1\) Cure Schedule - 20 hours at 25 °C plus 4 hours at 70 °C

\(^2\) Test Method ERF 12-64, mold size #1 (195 ml.).

\(^3\) Percent Weight Gained after 7 days immersion

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### Properties of Terrazzo Table 3 / Properties of Terrazzo

<table>
<thead>
<tr>
<th>Unit</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Impact Resistance, Falling Ball</td>
<td>No failure at 16 ft•lb</td>
</tr>
<tr>
<td>Flexural Strength</td>
<td>psi 3,500</td>
</tr>
<tr>
<td>Flammability, ASTM D-635</td>
<td>Self-extinguishing</td>
</tr>
<tr>
<td>Tabor Abrasion, loss per 1000 rev(^1)</td>
<td>mg 97.9</td>
</tr>
<tr>
<td>Tensile Bond Strength, concrete substrate (^2)</td>
<td>psi &gt;300</td>
</tr>
</tbody>
</table>

### Coefficient of Linear Thermal Expansion

\[ \text{Temp. range: -25 to 60 °C} \]
\[ \text{in./in./ °C} \]
\[ 49 \times 10^6 \]

### Resistance to Elevated Temperatures

Per MIL D 3134F, Section 3.10

\[ \text{No slip of flow at 70 °C} \]

\(^1\) CS 10 Wheel Loaded with 1,000 gm weight.

\(^2\) 100% concrete failure.

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