**TuffPaste™**
**Bug Hole & Bonding Epoxy**

### 1.01 DESCRIPTION
*TuffPaste™* is a two-component, 1:1, non-sag, high modulus, high strength, 100% solids, moisture tolerant, solvent free, structural epoxy adhesive developed specifically for use as a matrix with the *TuffArmor™* Structural Strengthening System. Please use the correct product grade that complies with VOC regulations as per federal, state, county and city regulations/codes at the place of installation of product.

### 1.02 USES
- Bonding of Concrete, Metals, and Wood
- Grout Bolts, Dowels, and Pins
- Level Small Surface Defects and Bug Holes
- Provide a Smooth Surface to Apply FRP
- Sealing of Cracks and Injection Port Setting

### 1.03 FEATURES
- Excellent Adhesion to Most Substrates
- Fast Set or Extended Pot Life Available
- High Abrasion and Shock Resistance
- Ideal for Vertical and Overhead Repairs
- Pick Proof Sealant

### 1.04 TECHNICAL DATA
*TuffPaste™* conforms to ASTM C-881, Type I, II, IV, and V, Grade 3, Classes B & C, & AASHTO M-235

### 1.06 COLOR
Concrete Gray
Special colors available on request.

### 1.07 PACKAGING
- 2-gallon kits: 1 gallon (3.78 liters) Side-A and 1 gallon (3.78 liters) Side B
- 10-gallon kits: 5 gallon (18.93 liters) Side-A and 5 gallon (18.93 liters) Side B
- 22 oz. dual cartridge

### 1.08 COVERAGE GUIDE
- CFRP Laminates: 100 sqft/gallon or 1 gallon/100 sqft (0.4 liters/sqm)
- Flat Bonding: 125 sqft/gallon or 1 1/4 gallon/100 sqft (0.51 liters/sqm)
- Crack Pasting: 50 sqft/gallon or 2 gallons/100 sqft (0.80 liters/sqm)
1 gallon yields: 231 cuin (0.00379 cum) of paste adhesive

### 1.09 PREPARATION
Maximum adhesion is obtained when surfaces to be bonded are free of oil, grease, rust, loose particles, and other contaminants. Abrasive blast cleaning and mechanical removal methods are recommended.

### 1.10 MIXING
Before blending *TuffPaste™* Resin and Hardener, stirring may be necessary, especially in case of filled materials. Place Side A Resin and Side B Hardener into a clean cylindrical container according to the specified mixing ration. Mix for 2-1/2 to 3 minutes or until thoroughly blended using either the PSI’s Rapid Pail Mixer “or” a 1/2+ HP heavy-duty, variable speed drill with the PSI’s Rapid Mortar Paddle utilizing the PSI’s Rapid 1 Man Stand. Mix at slow speed (less than 850 rpm) to avoid air entrainment. If hand mixing, periodically scrape the walls and the bottom of the container to avoid unmixed material which will result in soft spots after curing. For room temperature cure systems, once the Resin and Hardener are mixed together, an exothermic reaction takes place developing some heat which accelerates the process of cure. The viscosity of such a self-heating system first decreases then, at the end of the GEL TIME, increases until the material gels. At this moment the temperature of the product keeps rising, and in the case of large batches can result in overheating with unpleasant fumes and smoke. Do not mix more material than you are able to apply in one step. Remember, you will have less working time at higher temperatures.

### 1.11 APPLICATION
*TuffPaste™* can be applied by putty knife, trowel, or bulk caulking gun.
For filling bug holes, use very thin layers and work into the hole thoroughly in order to prevent bridging the holes rather than filling. As a structural adhesive, apply the neat mixed *TuffPaste™* to the prepared substrates. Work into the substrate for positive adhesion. Secure the bonded unit firmly into place until the adhesive has cured. The glue line should not exceed 1⁄8" (0.3175 cm). To seal cracks for injection grouting, place the neat mixed material over the cracks to be pressure injected and around each injection port. Allow sufficient time to: set before pressure injecting. For routed vertical and overhead patching place the prepared mortar in void, working the material into the prepared substrate, filling the cavity. Strike off level. Lift line should not exceed 1⁄8" (0.3175 cm).

### 1.12 CURING/DRY TIME
- Tack Free Time: 2-3 hours
- Initial Cure 24 hours
- Final Cure 7 days

### 1.13 CLEAN UP
Uncured *TuffPaste™* can be removed from tools and equipment with EnviroClean™, Isopropyl alcohol, xylene, or mineral spirits. Dispose of in accordance with local, state, and federal disposal regulations. Mechanical removal is necessary for cured material.
1.14 SHELF LIFE AND STORAGE
The shelf life of properly stored TuffPaste™ is two years from date of manufacture in original unopened container. Store TuffPaste™ in its original containers and keep tightly closed. Do not allow the accumulation of water, dirt or other contaminants. Store at 40–90°F (4-35°C).

1.15 LIMITATIONS
Do not thin with solvents, as this will prevent cure. Not recommended for any application where there may be a sustained tensile load, including overhead applications. Not designed to stop seeping or flowing water. Remove standing water before applying in moist or damp conditions. Always test a small amount to ensure that the product is mixed thoroughly and that the material will harden properly before proceeding. Minimum age of concrete must be 3-7 days, depending on curing and drying conditions.

1.16 CAUTION
Avoid breathing of vapors. Forced local exhaust is recommended to effectively minimize the exposure. NIOSH approved, organic vapor respirators and forced exhaust are recommended in confined areas, or when conditions (such as heated polymer, sanding, etc.) may cause high vapor concentrations. Do not weld on, burn or torch the TuffPaste™ or any epoxy material. Hazardous vapor is released when an epoxy is burned.

Avoid skin or eye contact. Wash skin with soap and water if contact occurs. If eye contact occurs flush with water for 15 minutes and obtain medical attention.

READ SDS PRIOR TO USING PRODUCT. KEEP OUT OF THE REACH OF CHILDREN.

1.18 TYPICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mix Ratio</td>
<td>1:1</td>
</tr>
<tr>
<td>Mixed Color</td>
<td>Gray</td>
</tr>
<tr>
<td>Viscosity</td>
<td>Gel/Paste</td>
</tr>
<tr>
<td>Gel Time (ASTM 881)</td>
<td>12 Minutes</td>
</tr>
</tbody>
</table>

TYPICAL CURED PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial Cure Time (73°F or 23°C)</td>
<td>2 to 3 hours</td>
</tr>
<tr>
<td>Final Cure</td>
<td>3 Days</td>
</tr>
<tr>
<td>Compressive Strength (ASTM D-695)</td>
<td>12250 psi (84.46 MPa)</td>
</tr>
<tr>
<td>Compressive Modulus (ASTM D-695)</td>
<td>300,000 psi (2068 MPa)</td>
</tr>
<tr>
<td>Bond Strength at 1 Day (ASTM 882)</td>
<td>1,925 psi (13.27 MPa)</td>
</tr>
<tr>
<td>Bond Strength at 7 Days (ASTM 882)</td>
<td>2,850 psi (19.65 MPa)</td>
</tr>
<tr>
<td>Elongation (ASTM D-638)</td>
<td>1.58%</td>
</tr>
<tr>
<td>Water Absorption (ASTM D-570)</td>
<td>0.1%</td>
</tr>
<tr>
<td>Heat Deflection (ASTM D-648)</td>
<td>140°F (60°F)</td>
</tr>
<tr>
<td>Viscosity</td>
<td>1/4 inch no-sag gel</td>
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<tr>
<td>Tensile Strength</td>
<td>7,559 psi (51.7 MPa)</td>
</tr>
<tr>
<td>Tensile Elongation:</td>
<td>1.59%</td>
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<tr>
<td>Shear Strength (ASTM D732)</td>
<td>2,800 psi (19.3 MPa)</td>
</tr>
<tr>
<td>Shrinkage on Cure (ASTM D2566)</td>
<td>0.001</td>
</tr>
<tr>
<td>Thermal Compatibility (ASTM C884)</td>
<td>Pass</td>
</tr>
</tbody>
</table>

Please read all information in the General & Safety Guidelines, Technical Data Sheets, Guide Specifications and Safety Data Sheets (SDS) before applying material. PSI Products are for “Professional Use Only” and preferably applied by professionals who have prior experience with the PSI Products or have undergone training in application of PSI Products. Published technical data and instructions are subject to change without notice. Contact your local PSI representative or visit our website for current technical data, instructions, and project specific recommendations.

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