



POLY-TUFF SYSTEMS
INTERNATIONAL
HIGHWAY DIVISION

TuffMax™

Structural Epoxy Grout

1.01 DESCRIPTION

TuffMax™ Structural Epoxy Grout is a high-performance, expansive, non-shrink, moisture-insensitive epoxy system for supporting equipment requiring precision alignment. TuffMax™ is a three component, 100% solids, solvent-free system formulated to exhibit high early strength combined with the highest creep resistance at elevated temperatures. TuffMax™ is suitable for grouting bases of numerous configurations and formulated to be used in both deep pours and thin or thick sections. Please use the correct product grade that complies with VOC regulations as per federal, state, statutory bodies, county and city regulations/codes at the place of installation of product.

1.02 USES

- Bridges, Parking Decks & Ramps
- Pile Jacket wrapping
- Precision seating of base plates
- Vibratory machinery, reciprocating engines,
- Anchorages on post tensioning projects
- Wind turbine tower bases
- Tanks, turbines and housings
- Crane Rails

1.03 FEATURES

- Made in America
- High impact resistance
- Low exothermic cure for deep pours
- High oil and chemical resistance
- Excellent flow ability
- Fast setting/quick return to service
- Moisture-tolerant
- Pre-measured units
- Easy soap and water clean up

1.04 TECHNICAL DATA:

USDA certifiable for incidental food contact. **TuffMax™** is a 100% solids, high flow, high strength epoxy grout capable of applications up to 18" (45.72 CM) in a single pour.

1.05 COLOR

Gray

1.06 PACKAGING

1/2 cuft (0.014 cum) kit:

0.75 gallon (2.83 liters) packed in a 1 gallon can of Side A, 0.25 gallon (0.945 liter) can of Side B and one 56 lb (25.4 kg) bag of aggregate

2.0 cuft (0.056 cum) kit:

3 gallons (11.34 liters) contained in a 5 gallon pail of Side A, 1 gallon (3.78 liter) can of Side B and four 56 lb (25.4 kg) bags of aggregate

1.07 PREPARATION:

Concrete shall have reached its design strength and be dimensionally

stable prior to placement of **TuffMax™** Structural Epoxy Grout. All surface contamination must be removed by mechanical means, creating a surface profile of exposed sound aggregate that will provide a strong bond surface for the **TuffMax™**. All metal surfaces to come in contact with grout should be sandblasted to white metal finish and wiped clean with solvent.

Apply PSI's **RustCheck™** permanent rust converter to any exposed steel. Items not intended to bond to grout, such as leveling screws, wedges and bolts must be protected with wax, caulk, duct tape or similar.

Form preparation: Epoxy grouts require heavy duty forms. Formwork shall be constructed of rigid non-absorbent materials, securely anchored, strong enough to resist forces developed during grout placement. Caulk, putty, or similar sealant should be used to render the forms "watertight". The clearance between formwork and base plate shall be sufficient to allow for a head box. Forms should be designed to allow for a hydraulic head to facilitate the placement of **TuffMax™**. A sheet of 3/4" (10.16 cm) plywood and proper bracing should be used to hold the force of the weight of the grout (140 lbs/ cuft [64kg/cum]). Areas where bond is not desired must be coated with a minimum of two coats of an industrial grade paste wax or polyethylene to facilitate removal of forms after cure. Forms should have 45° angle chamfer strips at all vertical corners and horizontal grout grade elevation in order to eliminate sharp corners. Isolation joints may be necessary depending on pour dimensions to minimize the potential for cracking in epoxy grout. Contact Poly-Tuff Systems International (PSI) for further information.

1.08 MIXING

TuffMax™ Structural Epoxy Grout is shipped in pre-measured 1/2 cuft or 2.0 cuft units. Mix these products **ONLY** in complete units. **DO NOT THIN** or add any solvents prior to mixing.

TuffMax™ 1/2 cuft (0.014 cum) kit: Side A Resin, and Side B Hardener are packaged in separate 1 gallon (3.78 liter) containers. Pour both liquid components into pail and mix thoroughly for 3 minutes with using either the PSI's **Rapid Pail Mixer** "or" a 1/2 + hp heavy-duty drill with the PSI's **Mortar Paddle** utilizing the PSI's **1 Man Stand**.

NOTE: Keep mixer at bottom of pail to avoid introducing air. After liquid components are mixed well, slowly add component Side C Aggregate. Mix only until all aggregate is wetted out.

TuffMax™ 2.0 cuft (0.056 cum) kit: Side A Resin is packaged in a 5 gallon (18.9 liter) pail, Side B Hardener is packaged in a 1 gallon (3.78 liter) pail, and Side C Aggregate is packaged in (4) 56 lb (25.4 kg) poly-lined bags. Pour Side B into 5 gallon (18.9 liter) pail containing Side A Resin. Mix material thoroughly for 3 minutes with a Jiffy mixer on a low-speed (300 rpm) drill motor until a uniform consistency is achieved. NOTE: Keep mixer at bottom of pail to avoid introducing air. Pour liquids into mortar mixer, making sure to remove all resins from sides and bottom of pail with spatula or similar tool. Introduce first bag of Side C-aggregate prior to starting mixer. Start mixer and slowly add the remaining three bags of aggregate. Mix only until all aggregate is wetted out! DO NOT OVER mix.

1.09 APPLICATION

The mixed **TuffMax™** grout should be poured continuously and in such a manner as to provide full and complete contact with base plate; free of air voids. Strapping will facilitate moving the grout into position. Grout should be placed at a minimum of 1" (2.54 cm) thick up to a maximum of 18" (45.72 cm) thick per lift in a large mass. Full aggregate extension must be used for large applications in excess of 6" (15.24 cm) deep. Anchor bolt holes should be dry and free of all dust and debris before grout placement. Strict adherence to temperature considerations will assist the placement properties. Check forms frequently for leaks. Plug leaks with a hydraulic cement or putty. **TuffMax™** will not self-seal.

1.10 POST-PLACEMENT PROCEDURES

Final finishing should ensure material is flush with bottom edge of base plate. Finishing of exposed surfaces is aided by using a solvent wiped trowel just before material becomes unworkable. In-service operation may begin immediately after minimum required grout strength and modulus have been achieved.

1.11 CURING/DRYING TIME

Pot Life (75°F)	2.0 hours
50° F (16°C)	4 hours
55° F (18°C)	3 hours
65° F (21°C)	2 hours
75° F (24°C)	1.5 hours
85° F (29°C)	45 min
95° F (35°C)	30 min

1.12 CLEAN UP

All tools and equipment may be cleaned with water and a strong detergent solution before the **TuffMax™** sets up using PSI's **Solvent 100™**, **EnviroClean™** or Acetone. Sand may be used as an abrasive.

1.13 STORAGE AND SHELF LIFE

The material should be stored between 40-95°F (4-35°C) in a cool, dry area away from direct sunlight. Shelf life of properly stored, unopened containers is 24 months. Excessive temperature differential and or high humidity can shorten the shelf life expectancy.

1.14 LIMITATIONS

Surface and ambient temperature must be a minimum of 40°F (4°C).

1.15 CAUTION

Use with adequate ventilation. Wear protective clothing, gloves and eye protection (goggles, safety glasses and/or face shield. Do not take internally. In case of ingestion, seek medical help immediately. May cause skin irritation upon contact, especially prolonged or repeated. If skin contact occurs, wash immediately with soap and water and seek medical help as needed. If eye contact occurs, flush immediately with clean water and seek medical help as needed. Dispose of waste material in accordance with federal, state and local requirements. Cured Resins are Innocuous.

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

1.16 PHYSICALS	
Compressive Strength (ASTM C-579)	4,200 psi (28.95 MPa) 8 hrs.
1 day	9,500 psi (65.50 MPa)
2 days	13,850 psi (95.49 MPa)
7 days	15,950 psi (109.97 MPa)
Compressive Modulus ASTM C 580	2,200,000 psi (15168 MPa)
Linear Shrinkage ASTM C-531	<0.005 Negligible
Bond Strength (ASTM C-882) @ 14 days	3,425 psi (1553 Mpa)
Coefficient of Thermal Expansion (max.) (ASTM C-531)	16 x 10-6 in/in/°F
Tensile Strength	2450 psi (1111 MPa)
Tensile Modulus ASTM C-307	2,100,000 psi (15168 MPa)

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.

LIMITED WARRANTY

PSI warrants its products to be free of manufacturing defects and that they will meet PSI current published physical properties. With preapproval, PSI warrants that its products, when properly installed by a state licensed waterproofing contractor according to PSI guide specifications and product data sheets over a sound, properly prepared substrate, will not allow water migration for a period of 12 months. Seller's sole responsibility shall be to replace that portion of the product which proves to be defective. There are no other warranties by PSI of any nature whatsoever expressed or implied, including any warranty of merchantability or fitness for a particular purpose in connection with this product. PSI shall not be liable for damages of any sort, including remote or consequential damages resulting from any claimed breach of any warranty whether expressed or implied. PSI shall not be responsible for use of this product in a manner to infringe on any patent held by others. In addition, no warranty or guarantee is being issued with respect to appearance, color, fading, chalking, staining, shrinkage, peeling, normal wear and tear or improper application by the applicator. Damage caused by abuse, neglect and lack of proper maintenance, acts of nature and/or physical movement of the substrate or structural defects are also excluded from the limited warranty. PSI reserves the right to conduct performance tests on any material claimed to be defective prior to any repairs by owner, general contractor, or applicator.

DISCLAIMER

All guidelines, recommendations, statements, and technical data contained herein are based on information and tests we believe to be reliable and correct, but accuracy and completeness of said tests are not guaranteed and are not to be construed as a warranty, either expressed or implied. It is the users responsibility to satisfy himself, by his own information and test, to determine suitability of the product for his own intended use, application and job situation and user assumes all risk and liability resulting from his use of the product. We do not suggest or guarantee that any hazard listed herein are the only ones which may exist. Neither seller nor manufacturer shall be liable to the buyer or any third person for any injury, loss or damage directly or indirectly resulting from use of, or inability to use, the product. Recommendations or statements, whether in writing or oral, other than those contained herein shall not be binding upon the manufacturer, unless in writing and signed by a corporate officer of the manufacturer. Technical and application information is provided for the purpose of establishing a general profile of the material and proper application procedures. Test performance results were obtained in a controlled environment and PSI makes no claim that these tests or any other tests, accurately represent all environments.

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