POLY-TUFF SYSTEMS
INTERNATIONAL
HIGHWAY DIVISION

TECHNICAL DATA SHEET

TuffSat™

Structural Epoxy Encapsulation Impregnating Resin

DESCRIPTION

TuffSat™ is a two-component, Lo-modulus, low viscosity, high strength, 100% solids structural epoxy adhesive for use with PSI Structural Strengthening Systems. TuffSat™ provides a long working time for application with no offensive odor. TuffSat™ is a high elongation material which gives optimum properties as a matrix for the TuffWrap™ System.

USES:

- Developed specifically for the PSI TuffWrap™ Systems
- Impregnating resin to FRP laminate
- Fire & Blast resistance
- Damage to Structural Components
- Increased live loads
- Seismic Strengthening
- Column wrapping
- Masonry walls
- Aging construction materials
- Vehicle impact Repair
- Change in Structural System
- Removal of walls or columns

FEATURES:

- Non-corrosive
- Alkali Resistant
- High Strength
- Light Weight
- Lo-Modulus, Low Viscosity, High Strength
- Extended pot life and long working time
- Excellent adhesion to concrete, steel, masonry, wood and other structural materials

TECHNICAL DATA:

Material & Curing conditions @ 73°F (23°C) & 50% R.H.:
Viscosity mixed: Approx. 500 cps
Tack Free: 14-16 hours
Mixing Ratio: Mix entire unit, do not batch
Reactivity: 6-7 Hours
Heat Deflection Temp: (ASTM D-648) 7 day
(fiber stress loading solution = 264 solution (1.8MPa) 120°F (50°C):
-40°to 140°F (40° to 60°C)

COVERAGE GUIDE:

First coat: 40-50 sq. ft. per gal. Additional coats: 100 sq ft. per gal.

PREPARATION:

Surface must be clean, dry, and structurally sound and must be free of moisture and frost. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, disintegrated materials and other bond inhibiting materials from the surface. Existing uneven surfaces must be filled with an appropriate repair mortar. Minor imperfections can be filled with **TuffPaste™**. The adhesive strength of the concrete should be verified after surface preparation by random pull-off testing (ACI 503R) at the discretion of the engineer. Minimum tensile strength, 200 psi (1.4 MPa) with concrete substrate failure.

MIXING:

Mix entire units, do not batch mix. Mix for 2-1/2 to 3 or until thoroughly blended using either the **PSI Rapid Pail™** Mixer or a 1/2 + HP heavy-duty, variable speed drill with a "Jiffy" mixer or our "PSI Mortar Paddle" utilizing the **PSI 1 Man Stand™**. *See Equipment Data Sheet.

Mix at slow speed (less than 850 rpm) to avoid air entrainment. In case of hand mixing, periodically scrape the walls and the bottom of the container to avoid unmixed material which will result in soft spots after curing. Mix thoroughly for 3 minutes with until uniformly blended. Mix only quantities that can be applied within the product's pot life.

PLACEMENT:

Dry Layup: Spread **TuffSat™** at 40 sq.ft per gallon with a brush or roller over the clean and dry concrete surface. Immediately afterward, lay in or apply the **TuffWrap™** fabric while ensuring the proper orientation of fibers by accurately flattening it by hand (protected by rubber waterproof gloves) and rollers. Squeegee and draw the air pockets out towards the edges. Roll out or squeegee all entrapped air and ensure that each individual layer is firmly bedded and adhered to the preceding layer or substrate. Apply a second coat of **TuffSat™** at 100 sq.ft per gallon.

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Wet Layup: On larger projects, the impregnation process for **TuffWrap™** may be accomplished using a mechanically driven fabric saturating device. The **TuffWrap™** fabric may also be manually saturated by hand on a polyethylene covered work table using a roller prior to placement. In either case, installation of this system should be performed only by a specially trained contractor.
(See instruction guide for complete applications.)

PROTECTIVE COATINGS:
TuffCoat™ UV resistant top coat can be applied when the surface has become tack free. In the case of a cementitious or plaster final coating, apply sand by hand for better bonding surface while the final coat of epoxy is still tacky. If paint is to be the final coating, paint between 24 and 72 hours after final application of epoxy. If more than 72 hours after application, prepare the surface of the final coat of epoxy by light sandblast or hand sanding to slightly etch the surface.

CLEAN UP:
Ventilate area. Confine spill. Collect with absorbent material. Dispose of in accordance with current, applicable local, state and federal regulations. Uncured material can be removed with approved solvent. Cured material can only be removed mechanically.

PACKAGING:
- 1, 3, and 6 gallon kits.

COLOR:
Clear to Light Amber

STORAGE:
Store dry at 40°F – 90°F (4°C – 35°C)
Condition material to 65°F – 75°F before using (18°C – 24°C)
SHELF LIFE:
2 years in original unopened container

LIMITATIONS:
PSI recommends design calculations be made by a certified independent licensed PE. Encapsulation of Concrete with **TuffWrap™** is not recommended in freeze/thaw zones, as the system is a vapor barrier.

SAFETY:
Eyes: Hold eyelids apart and flush thoroughly with water for 15 minutes.
Skin: Remove contaminated clothing. Wash skin thoroughly for 15 minutes with soap and water.
Inhalation: Remove person to fresh air. Ingestion: Do not induce vomiting. In all cases, contact a physician immediately if symptoms persist. Obtain, read, and understand the Safety Data Sheet (SDS) before use of this or any other Poly-Tuff Systems International product. With **TuffWrap™**, gloves are recommended to be worn to protect against skin irritation. When cutting **TuffWrap™** fabric protect against airborne carbon dust generated by the cutting procedure, by the use of an appropriate, NIOSH approved respirator.

IMPORTANT NOTE:
While all reasonable care is taken in compiling technical data on the Company's products, all recommendations or suggestions regarding the use of such products are made without guarantee, since the conditions of use are beyond the control of the Company. It is the user's responsibility to satisfy himself that each product is fit for the purpose for which he intends to use it, that the actual conditions of use are suitable, and that the information relating to each product has not been altered or superseded.

WARRANTY:
Due to the use of this product beyond our control, we assume no liability for damages of any kind, and the user accepts the product "as is" and without warranties, expressed or implied, from either **Poly-Tuff Systems International** or its agents. The suitability of the product for an intended use shall be solely up to the user. Our only obligation shall be to replace any material proved defective, with our liability limited to the purchase price of materials supplied by us.

Mechanical Properties:	
Minimum 7 day cure @ 73°F (23°C) and 50% R.H.	
Tensile Strength (ASTM D-790)	8,000 psi
Tensile Modulus (ASTM D-638)	4.6 x 10^5 psi
Elongation at Break (ASTM D-638)	4.8 %
Flexural Strength (ASTM D-790)	17,900 psi
Flexural Modulus (ASTM D-790)	5.06x10^5 psi
Glass-Transition Temperature (Tg)	160°F

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