



TYFO® S Saturant Epoxy

DESCRIPTION

The Tyfo® S Epoxy is a two-component epoxy matrix material for bonding applications. The Tyfo® S Epoxy combined with the Tyfo® fabrics make up the Tyfo® Systems which are NSF/ANSI Standard 61-G certified for drinking water systems. It is a high elongation material which gives optimum properties as a matrix for the Tyfo® system. It provides a long working time for application, with no offensive odor.

USE

The Tyfo® S Epoxy matrix material is combined with the Tyfo® fabrics to provide an ambient-cure wet-layup composite system for strengthening structural members. Tyfo® S Epoxy may be thickened with fumed silica or highly fibrillated HDPE (such as Cab-O-Sil TS-720 or Short Stuff® by MiniFibers) to be used as a primer, tack coat or finish depending on project requirements.

ADVANTAGES

- ICC-ES ESR-2103 listed product
- IAPMO UES ER-595 listed product
- Tyfo® Systems are NSF/ANSI Standard 61-G certified
- Good high and low temperature properties
- 100% solids, solvent-free
- Long working time
- High elongation
- Ambient cure

PACKAGING

Pre-measured 5-gallon units with a combined material volume of 4 gallons or in 55-gallon drums.

EPOXY MIX RATIO

100A : 34.5B by weight
100A : 42.0B by volume

CONSUMPTION RATE

Fabric-to-epoxy ratio by weight:
For Tyfo® SCH Fabrics: 1 : 1
For Tyfo® SEH Fabrics: 1 : 0.8

SHELF LIFE

Epoxy - two years in original, unopened and properly stored containers.
Fabric - 10 years in proper storage conditions.

STORAGE CONDITIONS

Store epoxy at 60°F to 100°F (15°C to 38°C). Resin is susceptible to crystallization at temperatures below 50°F. If crystallized, epoxy must be reheated until clear. Store fabric rolls flat, not on ends, and at temperatures below 100°F (38°C). Avoid moisture and water contamination.

Epoxy Material Properties

Material properties are based on standard laboratory conditions (23°C, 50 percent relative humidity.)

Property	Typical Test Value	
Net Weight	Component A	27.4 lbs. (2.8 gal)
	Component B	9.60 lbs. (1.2 gal)
	Mixed	37.0 lbs. (4.0 gal)
Color	Component A	Clear to amber
	Component B	Clear to yellow
	Mixed	Clear to amber
Viscosity	Component A	11,000-13,000 cps
	Component B	11 cps
	Mixed	600-700 cps
Density (D792) Pounds/Gallon	Component A	9.7 (1.16 kg/L)
	Component B	7.9 (0.95 kg/L)
	Mixed	9.2 (1.11 kg/L)
Pot Life (Working Time)	Mixed	3 to 4 hours
Gel Time (Time to Gelation)	Mixed	10 hours

Epoxy Material Properties

Cure schedule: 72 hour post-cure at 140°F (60°C)¹

Property	ASTM Method	Typical Test Values
Glass Transition Temperature, T _g	D4065 E1356	180°F (82 C)
Tensile Strength	D638 Type 1	10,500 psi (72.4 MPa)
Tensile Modulus		461,000 psi (3.18 GPa)
Elongation	D695	5.0%
Compressive Strength		12,500 psi (86.2 MPa)
Compressive Modulus		465,000 psi (3.2 GPa)
Flexural Strength	D790	17,900 psi (123.4 MPa)
Flexural Modulus		452,000 psi (3.12 GPa)
Shore D Hardness	D2240	87±3
Water Absorption (24 hours) Water Absorption (13 weeks)	D570	0.33% 1.98%
Adhesion Strength ² Concrete (ASTM D7522) Steel Epoxy	D4541	>400 psi (concrete failure typ.) >1200 psi >1200 psi

¹ Testing temperature: 73°F (23°C).

² Adhesion strength dependent on surface preparation and substrate thickness. Concrete adhesion strength is dependent on the concrete strength and is based on a minimum CSP-2 profile. Steel adhesion strength is based on SSPC-SP10 and SSPC-SP11 surface preparation methods. Cure schedule: 7 days at 73°F (23°C).

HOW TO USE THE TYFO® S SATURANT EPOXY

INSTALLATION

The Tyfo® system is to be installed by FyfeFRP LLC trained and certified applicators in accordance with the FyfeFRP LLC quality control manual, project specifications, and design requirements.

SURFACE PREPARATION

The required surface preparation is dependent on the type of element being strengthened. In general, the surface must be clean, dry and free of protrusions or cavities to prevent voids behind the Tyfo® system. Column surfaces that will receive continuous wraps typically only require a clean, sound substrate. Discontinuous wrapping surfaces (walls, beams, slabs, etc.) require a minimum CSP-2 profile to prepare for bonding, achieved by light sandblast, grinding or other approved methods per ICRI 310.2R. Tyfo® Composite Anchors may be incorporated in the designs. FyfeFRP LLC engineering staff will provide the proper specifications and details based on project requirements.

MIXING TYFO® S EPOXY

For pre-measured units in 5-gallon containers, pour the contents of component B into the component A container. Mix thoroughly with a low speed mixer at 400 to 600 RPM until uniformly blended. Ensure epoxy is transferred between the A and B buckets. For 55-gallon drums, mix component A and component B per the appropriate weight or volumetric mix ratio. Resin may be heated to achieve desired viscosity (i.e. radiant heating, drum heaters, water bath). Mixed Tyfo® S Epoxy may be thickened by adding up to 7 percent by weight of fumed silica (such as Cab-o-sil TS-720) or approved filler such as the Short Stuff, highly fibrillated HDPE fibers. DO NOT THIN. Solvents will prevent proper cure.

THICKENED TYFO® S EPOXY

Use Cab-o-sil TS-720 by Cabot Corp. or similar. For horizontal and vertical surfaces, use up to 2.0 lbs. fumed silica per kit or 5.4 percent by weight. For overhead surfaces use up to 2.5 lbs. per kit or 6.7 percent by weight. Site conditions may affect the amount of fumed silica required to achieve desired thickness. Do not exceed 7 percent by weight.

Short Stuff by MiniFibers, Inc. can be used as an approved alternate to Cab-o-sil TS-720. Use up to 2.6 lbs. of the highly fibrillated HDPE per kit. Do not exceed 2.6 lbs. per kit.

APPLICATION

Tyfo® S Epoxy is applied to the Tyfo® fabric using a saturator machine or by approved manual saturation methods (trowel, roller, or similar). Hand saturation is allowable, provided the epoxy is applied uniformly and meets the required fiber-to-epoxy ratio. Tyfo® S Epoxy is applied as a prime coat by brush or roller. Please refer to FyfeFRP LLC's NSF Listing for the NSF 61-G listed application method (www.NSF.org).

LIMITATIONS

Recommended substrate temperature range is 50°F to 100°F (10°C to 38°C). All coating applications to be performed at a minimum of 5.4°F above the dew point. Maintain conditions for the first 48 hours of cure. Temperatures below 50°F will significantly increase the viscosity of the mixed product. Higher viscosity will reduce fabric penetration, introduce additional air into the system, and extend the cure times beyond 48 hours. DO NOT THIN. Solvents will prevent proper cure.

CAUTION!

CLEANUP

Collect with absorbent material. Dispose in accordance with local disposal regulations. Uncured material can be removed with approved solvent. Cured materials must be mechanically removed.

HAZARDS

Consult the Safety Data Sheets (SDS) for associated hazards. SDS will be supplied upon request.

Consult safety data sheet
(SDS) for more information.
For industrial use only.

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