

# Tyfo<sup>®</sup> Fiber Anchor Systems

## Tyfo<sup>®</sup> SCH Composite Anchors

### DESCRIPTION

The Tyfo<sup>®</sup> SCH Composite Anchor is manufactured with the use of the Fibrbundle<sup>™</sup>, a multiple fiber tow compiling machine, at the Fyfe Co. LLC facility. The Tyfo<sup>®</sup> SCH Composite Anchor is manufactured from custom, uni-directional Tyfo<sup>®</sup> SCH carbon fiber reinforced roving for improved end details and force transfer in various Fibrwrap<sup>®</sup> designs. The anchors can be embedded and/or developed with thickened Tyfo<sup>®</sup> S epoxy, Tyfo<sup>®</sup> TC epoxy, Tyfo<sup>®</sup> TC-1 epoxy or Tyfo<sup>®</sup> MB-3 adhesive.

### USE

Tyfo<sup>®</sup> SCH Composite Anchor is combined with Tyfo<sup>®</sup> Epoxy to improve end details, anchorage and development of tension forces in various Fibrwrap<sup>®</sup> designs.

### ADVANTAGES

- System-compatible anchoring details
- Good high & low temperature properties
- Long working time
- High tensile modulus and strength
- Ambient cure

### PACKAGING

Packaged in various lot sizes. The number of anchors and weight will vary based on the anchor design requirements.

### EPOXY MIX RATIO

100.0 component A to 42.0 component B by volume. (100 component A to 34.5 component B by weight.)

### SHELF LIFE

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

### STORAGE CONDITIONS

Store epoxy at 40° to 90° F (4° to 32° C). Avoid freezing. Store rolls flat, not on ends, at temperatures below 100° F (38° C). Avoid moisture and water contamination.

### CERTIFICATE OF COMPLIANCE

- Will be supplied upon request, complete with state and federal packaging laws with copy of labels used.
- Material safety data sheets will be supplied upon request.
- Possesses 0% V.O.C. level.

### TYPICAL DRY FIBER PROPERTIES

Tensile Strength	550,000 psi (3.79 GPa)
Tensile Modulus	33.4 x 10 <sup>6</sup> psi (230 GPa)
Ultimate Elongation	1.7%

### COMPOSITE GROSS LAMINATE PROPERTIES

PROPERTY	ASTM METHOD	TYPICAL TEST VALUE	DESIGN VALUE*
Ultimate tensile strength in primary fiber direction	D7205	143,000 psi (986 MPa)	121,000 psi (834 MPa)
Elongation at break	D7205	1.2%	0.85%
Tensile Modulus	D7205	13.9 x 10 <sup>6</sup> psi (95.8 GPa)	11.9 x 10 <sup>6</sup> psi (82.1 GPa)

\* Design and specification values will vary based on individual project requirements and required area of composite anchor. Standard anchor diameters are 1/2" and 3/4", however, individual project designs will govern the required area. Contact Fyfe Co. LLC engineers to determine required design.

### EPOXY MATERIAL PROPERTIES

Curing Schedule 72 hours post cure at 140° F (60° C).		
PROPERTY	ASTM METHOD	TYPICAL TEST VALUE*
Tensile Strength <sup>1</sup>	D638 Type 1	10,500 psi (72.4 MPa)
Tensile Modulus	D638 Type 1	461,000 psi (3.18 GPa)
Elongation Percent	D638 Type 1	5.0%
Flexural Strength	D790	17,900 psi (123.4 MPa)
Flexural Modulus	D790	452,000 psi (3.12 GPa)
T <sub>g</sub>	D4065	180° F (82° C)

<sup>1</sup> Testing temperature: 70° F (21° C) Crosshead speed: 0.5 in. (13mm)/min. Grips Instron 2716-0055 - 30 kips

\* Specification values can be provided upon request.

## HOW TO USE THE TYFO® S COMPOSITE SYSTEM

### DESIGN

The Tyfo® System shall be designed to meet specific design criteria. The criteria for each project is dictated by the engineer of record and any relevant building codes and/or guidelines. The design should be based on the allowable strain for each type of application and the design modulus of the material. The Fyfe Co. LLC engineering staff will provide preliminary design at no obligation.

### INSTALLATION

Tyfo® System to be installed by Fyfe Co. LLC trained and certified applicators. Installation shall be in strict compliance with the Fyfe Co. LLC Quality Control Manual.

### SURFACE PREPARATION

The required surface preparation is largely dependent on the type of element being strengthened. In general, the surface must be clean, dry and free of protrusions or cavities, which may cause voids behind the Tyfo® composite. Discontinuous wrapping surfaces (walls, beams, slabs, etc.) typically require a light sandblast, grinding or other approved methods to prepare for bonding. The Fyfe Co. LLC engineering staff will provide the proper specifications and details based on the project requirements.

### MIXING

For pre-measured units in 5-gallon containers, pour the contents of component B into the pail of component A. For drums, premix each component: 100.0 parts of component A to 42.0 parts of component B by volume (100 parts of component A to 34.5 parts of component B by weight). Mix thoroughly for five minutes with a Tyfo® low speed mixer at 400-600 RPM until uniformly blended.

### APPLICATION

Apply the Tyfo® Epoxy to the Tyfo® SCH Composite Anchor by hand. The fully saturated anchor is then applied as detailed on the project drawings.

### LIMITATIONS

Application temperature of the epoxy is a minimum 40° F (4° C) and maximum of 100° F (38° C). DO NOT THIN, solvents will prevent proper cure.

### FIELD QUALITY CONTROL

Record batch numbers for fabric and epoxy used each day and note locations of installations. Measure square feet of fabric and volume of epoxy used each day.

## CAUTION!

### COMPONENT A - Irritant:

Prolonged contact to the skin may cause irritation. Avoid eye contact.

### COMPONENT B - Irritant:

Corrosive. Contact with skin may cause severe burns. Avoid eye contact. Product is a strong sensitizer. Use of safety goggles and chemical resistant gloves recommended. Remove contaminated clothing. Avoid breathing vapors. Use adequate ventilation. Use of an organic vapor respirator recommended.

### SAFETY PRECAUTIONS

Avoid breathing vapors. Avoid contact with eyes and skin. Use of an approved respirator with an organic absorption cartridge is recommended for possible vapors. Rubber gloves, rubber boots, and protective suits are recommended for handling and application of this material. Safety glasses or a face shield are recommended to prevent eye contact.

### FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water; contact physician immediately. For respiratory problems, remove to fresh air. Wash clothing before reuse.

### CLEANUP

Collect with absorbent material, flush with water. Dispose of in accordance with local disposal regulations. Uncured material can be removed with approved solvent. Cured materials can only be removed mechanically.

### SHIPPING LABELS CONTAIN

- State specification number with modifications, if applicable
- Component designation
- Type, if applicable
- Manufacturer's name
- Date of manufacture
- Batch name
- State lot number, if applicable
- Directions for use
- Warnings or precautions required by law

**KEEP CONTAINER TIGHTLY CLOSED.  
NOT FOR INTERNAL CONSUMPTION.  
CONSULT MATERIAL SAFETY DATA SHEET  
(MSDS) FOR MORE INFORMATION.  
KEEP OUT OF REACH OF CHILDREN.  
FOR INDUSTRIAL USE ONLY.**

## Fyfe Co. LLC

Tyfo® Fibrwrap® Systems

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