

# Tyfo® SCH-41S Composite using Tyfo® SW-1 Underwater Epoxy

## DESCRIPTION

Tyfo® SCH-41S composite reinforcing fabric combined with Tyfo® SW-1 Epoxy. Tyfo® SCH-41S is a custom weave, uni-directional carbon fabric. The carbon material is orientated in the 0° direction. The Tyfo® SW-1 Epoxy is a two-component epoxy matrix. The Tyfo® SW-1 epoxy is certified safe for potable water (ANSI/NSF 61) and incidental food contact.

## USE

Tyfo® SCH-41S Fabric is combined with Tyfo® epoxy material to add strength and ductility to bridges, buildings, and other structures, mainly for areas of moisture and underwater applications.

## ADVANTAGES

- Excellent for underwater applications
- Good high & low temperature properties
- High elongation
- Ambient cure
- Rolls can be cut to desired widths prior to shipping

## COVERAGE

Approximately 675 sq. ft. surface area with 3 to 4 units of Tyfo® SW-1 Epoxy and 1 roll of Tyfo® SCH-41S Fabric when used with the Tyfo® Saturator.

## PACKAGING

Order Tyfo® SW-1 Epoxy in 4-gallon pre-measured units in 5-gallon (19L) containers. Order Tyfo® SCH-41S Fabric in 24" x 300 lineal foot (0.6 m x 91.4 m) rolls. Typically ships in 12" x 13" x 64" (305mm x 330mm x 1626mm) boxes.

## EPOXY MIX RATIO

100.0 component A to 56.0 component B by weight. 100.0 component A to 74.0 component B by volume.

## SHELF LIFE

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

## STORAGE CONDITIONS

Store 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.

2/09 Tyfo® SCH-41S w/ SW-1

### 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%
Density	0.063 lbs./in. <sup>3</sup> (1.74 g/cm <sup>3</sup> )
Weight per sq. yd.	19 oz. (644 g/m <sup>2</sup> )

### COMPOSITE GROSS LAMINATE PROPERTIES\*\*

PROPERTY	ASTM METHOD	TYPICAL TEST VALUE	DESIGN VALUE*
Ultimate tensile strength in primary fiber direction, psi	D-3039	114,000 psi (786 MPa)	97,000 psi (668 MPa)
Elongation at break	D-3039	1.2%	1.0%
Tensile Modulus, psi	D-3039	9.45 x 10 <sup>6</sup> psi (65.1 GPa)	8.032 x 10 <sup>6</sup> psi (55.3 GPa)
Ultimate tensile strength 90 degrees to primary fiber, psi	D-3039	0	0
Laminate Thickness		0.04 in. (1.0 mm)	0.04 in. (1.0 mm)

\* Gross laminate design properties based on ACI 440 suggested guidelines will vary slightly. Contact Fyfe Co. LLC engineers to determine appropriate specification values.

\*\* Tested after 21 days

### Epoxy Material properties at 75° F

Mixing ratio, by wt.	100:56
Specific Gravity	1.6
Viscosity A & B mixed, cps	14,000-18,000
Gel Time, 65° F, hours	2.5 - 3.5
<b>ASTM D695, 7 day</b> compressive strength, psi	7,000 - 8,000
<b>ASTM D695, 7 day</b> compressive strength, mortar, psi (Tyfo® SW-1:sand – 1:1 by volume)	8,000 - 9,000
<b>ASTM D2240</b> Shore D hardness	80 - 85
Values presented are typical laboratory data.	

## HOW TO USE THE TYFO® SW-1 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 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. Tyfo®Fibrwrap® Anchors are incorporated in some designs. 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 (19L) 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 56.0 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

Feed fabric through the Tyfo® Saturator and apply using the Tyfo® wrapping equipment or approved hand methods. See data sheet on this equipment. Hand saturation is allowable, provided the epoxy is applied uniformly and meets the specifications.

### LIMITATIONS

Minimum application temperature of the epoxy is 40° F (4° C). DO NOT THIN, solvents will prevent proper cure.

## CAUTION!

### COMPONENT A - Irritant:

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

### COMPONENT B - Irritant:

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

Use of an approved particle mask is recommended for possible airborne particles. Gloves are recommended when handling fabrics to avoid skin irritation. Safety carbones are recommended to prevent eye irritation.

### FIRST AID

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush 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.

### TYFO® SW-1 COMPOSITE SAMPLES

Please note that field samples are to be cured for 48-hours at 140° F (60° C) before testing. Testing shall be in accordance with ASTM D-3039 and Fyfe Co. LLC sample preparation and testing procedures.

### 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 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

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