

# Tyfo® FC-F Fire-Resistant System

## DESCRIPTION

Tyfo® FC/F is a two-part heat-resistant system applied in combination with the Tyfo® Fibrwrap® Systems. Tyfo® FC is a two-component fire-resistant epoxy coating specially formulated to provide an increase in the existing fire rating. Tyfo® F is a one-component formulation designed to be applied over Tyfo® FC. The Tyfo FC/F System will provide an increase to the fire rating of an element as per ASTM E-119 and provides a Class 1, ASTM E-84 flame and smoke rating. The System has Underwriters Laboratories, Inc. (UL) approval to display the UL symbol on the Tyfo® FC materials as a UL rated system.

## USE

Suggested for applications requiring a barrier for fire protection. Proper application of this material will provide an increase in the existing fire rating.

## ADVANTAGES

- Increase to fire rating
- UL rated system
- ICC-ES ESR-2103 listed product
- Low profile system
- Ambient cure
- 100% solvent-free
- Can be covered with desired finish

## COVERAGE

One 3-gallon unit of Tyfo® FC will cover approximately 90 sq. ft. (8.36m<sup>2</sup>) of surface area when the material is applied at a rate of 0.22 lb./sq. ft. (0.10kg/0.09m<sup>2</sup>). The amplitude of the application surface will have a bearing on the actual coverage area. One gallon of Tyfo® F will cover approximately 75-100 sq. ft. The temperature at the time of application may vary the amount of coverage obtained.

## PACKAGING

Order pre-measured units in 5-gallon D.O.T. approved shipping containers.

## MIX RATIO

100.0 parts of component A to 24.7 parts of component B by volume. (100 parts of component A to 16.3 parts of component B by weight.)

## SHELF LIFE

Tyfo® FC: Two years in original, unopened and properly stored containers.  
 Tyfo® F: One Year.

## STORAGE CONDITIONS

Store at 40° to 80° F (4° to 27° C). Avoid freezing.

## 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.
- UL report R15357 will be supplied upon request.

## HOW TO USE THE TYFO® FC/F SYSTEM

### INSTALLATION

Tyfo® Systems 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

Large voids existing in the substrate should be filled prior to the application of Tyfo® FC. Tyfo® FP is a fast curing version of the Tyfo® FC material used to fill low and discontinuous areas. Tyfo® FC Epoxy Coating should be applied within 72 hours of the application of the Tyfo® Composite System. If more than 72 hours have passed, the application surface must be roughened by sandblasting and thoroughly cleaned with compressed air or other acceptable methods to provide a bondable surface. If water blasting is used, sufficient time must be allowed for adequate drying prior to application of Tyfo® FC. Tyfo® FC Epoxy Coating adhesion is dependent upon a clean, rough surface. The Fyfe Co. LLC engineering staff will provide the proper specifications and details based on the project requirements.

### MIXING OF TYFO® FC

For pre-measured units in 5-gallon containers, pour the contents of component B into the pail of component A. (100.0 parts of component A to 24.7 parts of component B by volume or 100 parts of component A to 16.3 parts of component B by weight). Mix for a minimum of three minutes with a 600-rpm, hand held mixer equipped with an appropriate mixing blade. To assure a complete and thorough mixing of the two parts, the Tyfo® FC Epoxy mixture shall be transferred into another pail. After the transfer, the walls of the mixing pail shall be scraped clean into the new pail, and then mixed for an additional two minutes. If material is too thick, heat unmixed components by placing containers in 130° F (54° C) tap water or sunlight, if available, until the desired viscosity is achieved. Do not thin; solvents will prevent proper cure.

## MIXING OF TYFO® F

Mix for a minimum of three minutes with a 600 rpm, hand held mixer equipped with an appropriate mixing blade to re-suspend ingredients that may have settled.

## APPLICATION

Using a trowel or paint roller, apply Tyfo® FC base coat to the composite surface, first making sure the surface is clean and free of debris. The required thickness is 0.225 lb./sq. ft. (or approximately 1/32" thick) and should be achievable with one coat. Allow coating to become tack-free to the touch before applying Tyfo® F coating. Finish coat may be applied within 24 hours depending on temperature and humidity. Apply Tyfo® F within 72 hours of the application of Tyfo® FC. If this is not possible, the Tyfo® FC surface should be scuff-sanded or cleaned with a sand blaster. Using a standard paint roller, apply the first coat of Tyfo® F over the Tyfo® FC base coat (desired thickness 2 mils or 0.04 lb./sq. ft. wet weight, each coat). When the first coat of the Tyfo® F has been allowed to become tack-free, another shall be applied at the same thickness. A total of three coats of Tyfo® F is required.

## LIMITATIONS

Minimum application temperature of the epoxy is 40° F (4° C). Applications in temperatures above 90° F (32° C) require close monitoring to prevent premature reaction. Do not mix excessive material, especially in warmer temperatures, than can be used within 1-hour as the greater mass will react faster. If material begins to set up, discard and mix new batch. **DO NOT THIN;** solvents will prevent proper cure.

## EPOXY COMPONENT PROPERTIES

Color	Component A is an off-white paste Component B is clear
Pot Life	In excess of 1-hour at 60° to 80° F (16° to 27° C)

## EPOXY MATERIAL PROPERTIES

PROPERTY	ASTM METHOD	TYPICAL TEST VALUE*
Tg 140° F (60° C) Post Cure (24 hours)		180° F (82° C)
Tensile Strength <sup>1</sup> , psi	ASTM D-638 Type 1	7,350 (50.7 MPa)
Tensile Modulus, psi		322,700 (2.23 GPa)
Elongation Percent	ASTM D-638 Type 1	3.5%
Flexural Strength, psi	ASTM D-790	12,530 (86.4 MPa)
Flexural Modulus, psi	ASTM D-790	316,400 (2.18 GPa)

<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.

### CAUTION!

**TYFO® FC COMPONENT A** - Irritant:  
Prolonged contact to the skin may cause irritation. Avoid eye contact.

**TYFO® FC 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.

### 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**  
**Nancy Ridge Technology Center**  
**6310 Nancy Ridge Drive, Suite 103, San Diego, CA 92121**  
**Tel: 858.642.0694 Fax: 858.642.0947**  
**E-mail: [info@fyfeco.com](mailto:info@fyfeco.com) Web: <http://www.fyfeco.com>**

**Statement of Responsibility:** The technical information and application advice in this publication is based on the present state of our best scientific and practical knowledge. As the nature of the information herein is general, no assumption can be made as to the product's suitability for a particular use or application, and no warranty as to its accuracy, reliability or completeness, either expressed or implied, is given other than those required by State legislation. The owner, his representative or the contractor is responsible for checking the suitability of products for their intended use. Field service, where provided, does not constitute supervisory responsibility. Suggestions made by the Fyfe Co., either verbally or in writing, may be followed, modified or rejected by the owner, engineer or contractor since they, and not the Fyfe Co., are responsible for carrying out procedure appropriate to a specific application.