



TYFO® UC

Laminate Strip System

DESCRIPTION

The Tyfo® UC Laminate Strips are unidirectional pull-formed, epoxy-carbon composite laminates. The rigid laminates are premanufactured resulting in high strength, high modulus composites.

USE

The Tyfo® UC Laminate Strips are used to strengthen bridges, buildings and other structures. The UC Laminate strips are externally bonding to the host substrate with the thickened Tyfo® S, Tyfo® TC, Tyfo® TC-1 or Tyfo® MB-3 epoxy adhesives.

ADVANTAGES

- ASTM E84 Class 1 Rating.
Flame Spread: 25 Smoked Developed: 140
- High tensile strength, high modulus
- Uniform material properties
- Ease of installation
- Good high and low temperature properties
- No release agents in the precured laminates
- 100% epoxy matrix
- Ambient cure application

PACKAGING

Available Thicknesses: 0.055" (1.4 mm) or 0.075" (1.9 mm). Laminate Width: 4.0" (101.6 mm)
Roll Length: 492 lineal ft. per roll (164 sq. ft.)
Typically ships in 40" x 40" x 6" boxes. Rolls are approximately 36" in inside diameter.

COVERAGE

30 sq. ft per unit at a thickness of 1/16" when using Tyfo® TC. 50 sq. ft per unit at a thickness of 1/16" when using thickened Tyfo® S (field made). Coverage is highly dependent on substrate condition and environment. Refer to the appropriate epoxy data sheet for more information.

SHELF LIFE

Epoxy - two years in original, unopened and properly stored containers
UC Laminates - 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

Typical Dry Fiber Properties

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

Property	Typical Test Value
Tensile Strength	710,000 psi (4.9 GPa)
Tensile Modulus	33.4 x 10 ⁶ psi (230 GPa)
Ultimate Elongation	2.1%
Density	0.065 lbs./in. ³ (1.8 g/cm ³)
Fiber Volume Content	62%

Laminate Material Properties

Property ¹	ASTM Method	Typical Test Value	Design Value
Ultimate Tensile Strength in Primary Fiber Direction	D3039	405,000 psi (2.79 GPa)	364,000 psi (2.51 GPa)
Elongation at Break		1.8%	1.67%
Tensile Modulus	D1777	22.5 x 10 ⁶ psi (155 GPa)	20.25 x 10 ⁶ psi (139 GPa)
Laminate Thickness 4UC55 4UC75		.055 inches .075 inches	

¹ Contact FyfeFRP LLC engineers to confirm project specification values and design methodology.

TYFO® UC LAMINATE STRIP SYSTEM

DESIGN

The Tyfo® UC Laminate Strip system is designed to meet specific project criteria dictated by the engineer of record and any relevant building codes and/or guidelines. The design shall be based on the allowable strain for each type of application and the design modulus of the material. FyfeFRP LLCC engineering staff may provide preliminary design, specification wording and application details based on the project requirements.

INSTALLATION

The Tyfo® system is to be installed by Fyfe Co. trained and certified applicators in accordance with the Fyfe Co. 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® UC Laminate Strip system. Walls, beams, slabs, etc. require a minimum CSP-2 profile to prepare for bonding, achieved by abrasive blasting, grinding or other approved methods per ICRI 310.2R-2013. FyfeFRP LLCC engineering staff will provide the proper specifications and details based on project requirements.

APPLICATION

Apply a prime coat of Tyfo® S epoxy to the prepared substrate and allow to soak into substrate. Apply a 1/32" (1mm) layer of the Tyfo® epoxy (Thickened Tyfo® S, TC, TC-1, or MB-3) to the substrate. Clean abraded side of Tyfo® UC Composite Laminate Strip (side without lettering and without glossy appearance) with acetone to remove any foreign debris and let stand for 5-10 minutes to allow for evaporation of the solvent. Apply a 1/16" (2mm) layer of Tyfo® epoxy adhesive to the cleaned side of strip. Allow sufficient time for the epoxy to reach maximum tackiness. Apply the Strip within the specified cure time of the Tyfo® epoxy. The Tyfo® UC Laminate Strip System to be applied uniformly, meeting all specifications.

DESIGNATIONS

The Tyfo® UC Composite Laminate Strip System is designated by the width then the thickness in mils. Example - 4" wide, 0.055-inch laminate would be designated as "4UC55."

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°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

Use caution when uncoiling roll. Gloves are recommended when handling strips to avoid skin irritation. Consult the Safety Data Sheets (SDS) for associated hazards. SDS will be supplied upon request. Carbon fiber is electro-conductive.

Consult Safety Data Sheet
(SDS) For More Information.
For Industrial Use Only.

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 FyfeFRP LLC, either verbally or in writing, may be followed, modified or rejected by the owner, engineer or contractor since they, and not the FyfeFRP LLC, are responsible for carrying out procedure appropriate to a specific application.