

CSS-CUGF27

Code-Listed Unidirectional E-Glass Fabric

SIMPSON

Strong-Tie®

®

DESCRIPTION

CSS-CUGF27 is a unidirectional, high-strength, non-corrosive E-glass fabric designed to be field laminated with CSS-ES saturant resin to create a glass-fiber-reinforced polymer (GFRP) composite for structural reinforcement applications. This product has been evaluated per ICC-ES AC125 for concrete and unreinforced masonry strengthening using externally bonded fiber-reinforced polymer (FRP) composite systems. This product is NSF-listed safe for potable water. Please refer to the NSF listing for the NSF 61-listed application. This product is part of the tested assembly in UL Design No. N861, which achieved a four-hour fire rating when subjected to ASTM E119 / UL 263 full-scale fire testing. Please refer to UL Online Certifications Directory for the UL listing. Meets Class A flame spread/smoke developed requirements when coated with FX-207.

CODES

ICC-ES ESR-3403



MATERIAL PROPERTIES

Dry Fiber Properties

Tensile Strength	330,000 psi (2,300 MPa)
Tensile Modulus	10,500 ksi (72 GPa)
Elongation at Break	4.0 %
Weight	27.0 oz./yd. ² (915 g/m ²)
Color	White
Density	0.092 lb./in. ³ (0.0025 g/mm ³)
Dry Fabric Thickness	0.0142 in. (0.36 mm)

Cured Composite Properties¹

Property	Design Value ²
Tensile Strength	56,000 psi (390 MPa)
Tensile Modulus	3,300 ksi (23 GPa)
Elongation at Break	1.7%
Thickness per Layer	0.05 in. (1.3 mm)
Stiffness/width	165 k/in. (29,900 N/mm)

1. When laminated with CSS-ES saturating resin, post cured for 48 hours at 140°F (60°C) and tested per ASTM D3039.

2. Tensile properties based on five percent fractile approach per ACI.



STRUCTURAL CONCRETE FIBER-REINFORCED COMPOSITE SYSTEM FOR USE IN BEAM/SLAB EXTERNAL REINFORCING SYSTEM
FIRE RESISTANCE CLASSIFICATION
SEE UL FIRE RESISTANCE DIRECTORY <R37897>

PERFORMANCE FEATURES

- High strength
- Lightweight
- Ambient cure
- Non-corrosive
- Molds to fit various shapes
- Low aesthetic impact
- Compatible with many coatings
- NSF listed (info.nsf.org/certified/pwscomponents)
- UL listed (www.ul.com/database)
- Component of Class A flame spread/smoke developed indices test

APPLICATIONS

Seismic Retrofit

- Shear strengthening
- Displacement/ductility
- Life safety

Load Rating Upgrade

- Increased live loads
- New equipment
- Change of use

Damage Repair

- Deterioration/corrosion
- Blast/vehicle impact

Defect Remediation

- Size/layout errors
- Low concrete strengths

Blast Mitigation

- Hardening
- Progressive collapse

STRUCTURES

- Buildings
- Bridges
- Parking garages
- Chimneys
- Piers/wharfs
- Tunnels
- Pipes

ELEMENTS

- Columns
- Beams
- Slabs
- Walls
- Piles
- Pier caps

SUBSTRATES

- Concrete
- Masonry
- Timber
- Steel

PACKAGING

Roll Size (Width x Length)

50 in. x 140 ft. (1270 mm x 43 m)

25 in. x 140 ft. (635 mm x 43 m)

Model No.

CSS-CUGF2750

CSS-CUGF2725

SHELF LIFE

10 years in unopened, undamaged carton

STORAGE

Store material in a dry area with no exposure to moisture.

Design

The number of layers, dimensions, and detailing of CSS-CUGF27 shall be designed in accordance with ACI 440.2R or another recognized design guideline/code in order to meet the design performance specified for the application. Contact Simpson Strong-Tie engineers for design and technical support.

Surface Preparation

Repair existing substrate per ICRI Guideline No. 310.1R. Concrete shall be abrasively prepared to achieve an open pore structure and CSP-3 in accordance with ICRI Guideline No. 310.2R by means of grinding, sand blasting, shot blasting, or pressure washing. Application surfaces shall be clean, sound, and free of standing water at time of application. All dust, laitance, grease, curing compounds, and other foreign materials that may hinder the bond must be removed before installation. In some applications, such as column confinement, the engineer may determine that the installation is not bond-critical, in which case abrasive surface preparation is not required. Existing concave and convex surfaces must be filled/transitioned using CSS-EP, thickened CSS-ES epoxy, or a suitable repair mortar. All corners to be wrapped around shall be rounded to a $\frac{3}{4}$ in. (19 mm) minimum radius using a grinder, CSS-EP, or thickened CSS-ES epoxy.

Application

CSS installation shall only be performed by contractors and personnel who have been properly trained by Simpson Strong-Tie. Apply one coat of CSS-ES primer using a nap roller. Where minor surface defects are present, apply CSS-EP or CSS-ES epoxy saturant thickened with fumed silica (maximum ratio of 2 parts fumed silica to 1 part epoxy, by volume) in lifts no thicker than 1 in. (25 mm). Apply the saturated fabric before the primer and paste / thickened epoxy have cured. Sheets can be cut to required length using heavy duty scissors. Saturate fabric mechanically or manually, ensuring that full fiber saturation is achieved. Apply the saturated sheet to the primed surface and remove entrapped air using hand pressure, rollers, or trowels. Apply additional layers as necessary to meet the project requirements, ensuring each layer is in firm contact with the previous layer. Feather all seams and edges with CSS-EP or thickened CSS-ES epoxy. Allow epoxy to fully cure (approximately 72 hours at 70°F) and lightly sand epoxy before applying finish coating.

Pot Life: 1 hour at 70°F (21°C).

Cure Time: 72 hours at 70°F (21°C).

Limitations

CSS installation shall only take place when the ambient and substrate temperatures are between 45°F (7°C) and 95°F (35°C).

CAUTION

Protective Measures: The use of safety glasses and chemically resistant gloves is recommended. Use appropriate clothing to minimize skin contact. The use of NIOSH-approved respirator is required to protect respiratory tract when ventilation is not adequate to limit exposure below the PEL. Refer to Safety Data Sheets (SDS) available at strongtie.com/sds for detailed information.

FIRST AID

Eye Contact: Immediately flush eyes with plenty of water for at least 15 to 20 minutes. Ensure adequate flushing of eyes by separating the eyelids with fingers. Do not rub or scratch eyes. If eye irritation persists, seek medical advice.

Skin Contact: Wash off immediately with soap and cold water. DO NOT use warm water because this will open up the pores of the skin, which will cause further penetration of the fibers. Use a wash cloth to help remove fibers. DO NOT run or scratch the affected areas. Remove contaminated clothing. If irritation persists, seek medical advice.

Inhalation: Move to fresh air. If symptoms persist, seek medical advice.

Ingestion: Accidental ingestion of this material is unlikely. If this does occur, watch affected person for several days to make sure intestinal blockage does not occur. Rinse mouth with water and drink water to remove fibers from the throat. If symptoms persist, seek medical advice.

CLEAN-UP

Methods for containment: This material will settle out of the air. Prevent from spreading by covering, diking or other means.

Methods for cleanup: Use an industrial vacuum cleaner with a high efficiency filter to clean up dust and fiber contamination. Avoid dry sweeping. Pick up and transfer to properly labeled containers.

Disposal Considerations

Waste Disposal: Dispose of in accordance with Local, State, Federal and Provincial regulations.

Contaminated Packaging: Empty containers should be taken for local recycling, recovery or waste disposal.

LIMITED WARRANTY

This product is covered by the Simpson Strong-Tie RPS Product Five-Year Limited Warranty, which is available at strongtie.com/limited-warranties or by calling Simpson Strong-Tie at (800) 999-5099.

IMPORTANT INFORMATION

It is the responsibility of each purchaser and user of each Product to determine the suitability of the Product for its intended use. Prior to using any Product, consult a qualified design professional for advice regarding the suitability and use of the Product, including whether the capacity of any structural building element may be impacted by a repair. As jobsite conditions vary greatly, a small-scale test patch is required to verify product suitability prior to full-scale application. The installer must read, understand and follow all written instructions, and warnings contained on the product label(s), Product Data Sheet(s), Safety Data Sheet(s) and the strongtie.com website prior to use. For industrial use only by qualified applicators. KEEP OUT OF REACH OF CHILDREN!

 **WARNING!** Cancer and reproductive harm — www.P65Warnings.ca.gov.