RenewWrap™ ESR CF600

Unidirectional Carbon Fiber Reinforcing Fabric

BRIDGES + ROADWAYS | BUILDINGS + PARKING FACILITIES | OIL, GAS + INDUSTRIAL

RenewWrap™ ESR CF600 is a dry, unidirectional reinforcing fabric made with high-strength, standard modulus carbon fibers. RenewWrap ESR CF600 fabrics, along with RenewWrap™ ESR Saturant are used to strengthen or retrofit existing concrete and masonry structures.

Benefits

- Lightweight, flexible, high-strength fabric can be wrapped around and externally bonded to structural elements
- Easy to impregnate using wet or dry lay-up methods
- EZ-Slit™ system enabling accurate, rapid, and clean slitting

Limitations

- Design calculations shall be made and sealed by a licensed, independent engineer knowledgeable with the design of FRP strengthening systems.
- Avoid completely encapsulating/covering concrete or masonry members subject to freeze/thaw or moisture vapor transmission.
- Ambient temperature cure wet lay-up FRP strengthening systems are not suitable for applications requiring substantial strengthening and a structural fire rating. For these applications, consider using the **FireStrong™ FRP Strengthening System.**

Product Designation

RenewWrap™ ESR CF600 products are available with and without EZ-Slit slitting zones. All products have a total reinforcement width of 24", with the roll width increasing slightly to accommodate the slitting zones. Other roll widths and EZ-Slit configurations are available.

PRODUCT DESIGNATION	NO. OF FABRIC ZONES	ZONE WIDTH
CF600 – 1 x 24	1	24 in. (610 mm)
CF600 – 2 x 12	2	12 in. (305 mm)
CF600 – 4 x 6	4	6 in. (152 mm)
CF600 – 1 x 50	1	50 in. (1270 mm)
CF600 – 2 x 24	2	24 in. (610 mm)

Typical Uses

Recommended for:

- Strengthen for load increases
- Address changes in structural system, like slab openings
- Retrofit for seismic, wind, or blast
- Restore strength to damaged members like fire or vehicle impact
- Restore strength to deteriorated members subject to corrosion
- Strengthen for design/construction errors

Packaging

The material is available in 150 ft. (45.7 m) long rolls suspended in boxes. Yield equals 300 ft^2/roll (27.8 m^2).

Storage & Shelf Life

Store in a cool, dry place at 50-90 °F (10-32 °C) on a roll suspended in a box away from flame or other hazards. Shelf life is 10 years in unopened packaging.

Caution

RenewWrap carbon fabrics are non-reactive. Wear appropriate PPE and use caution when handling since fine carbon dust may be present on surface of fabric. Use caution when cutting or working with carbon fiber around electrical equipment since carbon fibers are electrically conductive. SDS are available and should be consulted for additional information.

www.cs-nri.com
281-590-8491

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Typical Fabric and Fiber Properties[1]

PROPERTY	VALUE
Fiber Type	Carbon
Color	Black
Fabric Construction	Unidirectional
Fiber Tensile Strength	700 ksi (4830 MPa)
Fiber Tensile Modulus	33,400 ksi (230 GPa)
Fiber Rupture Strain	2.0%
Fabric Areal Weight[2]	18 oz./yd^2 (600 gsm)

NOTES:

1. Fiber properties are typical values of the fibers used in the manufacture of the reinforcing fabrics. They are based on proprietary test methods employed by the supplier of the carbon fibers. Fiber properties shall not be used for design. They are reported here to provide the designer with a general understanding of the grade of fibers used in the reinforcing fabrics.
2. Reported value represents the minimum fabric areal weight.

Physical Properties

PROPERTY	VALUE	METHOD
Nominal Thickness[1]	0.050 in. (1.3 mm)	
Glass Transition Temperature	140 °F (60 °C)	ASTM E1640

Mechanical Properties

PROPERTY	VALUE	METHOD
Tensile Strength	123 ksi (850 MPa)	ASTM D3039
Tensile Modulus of Elasticity[2]	9.6 Msi (66 GPa)	ASTM D3039
Elongation at Break	1.16%	ASTM D3039
Tensile Strength/Unit Width	6.1 kip/in./ply (1.07 kN/mm/ply)	ASTM D7565
Tensile Modulus/Unit Width[2]	480 kip/in./ply (84 kN/mm/ply)	ASTM D7565

NOTES:

1. The reported thickness is based on measurements made on panels prepared in the laboratory. Based on experience the typical thickness of a single ply (fibers + saturant), impregnated with **RenewWrap™ ESR Saturant** is approximately 0.06-0.08 inch depending on how the fabric is impregnated in the field. Actual thicknesses measured in the field may vary slightly. As with any FRP strengthening system, the strength/unit width and modulus/unit width should be used for design and for field QC purposes.
2. Modulus of elasticity and unit stiffness are reported as average values in accordance with ACI 440.2R and shall be used for design. They shall not be used for accepting/rejecting results of field QC test results.
3. Test samples are conditioned for 48 hours at 140 °F (60 °C). Tg values based on long term curing at room temperature conditions. Higher Tg values may be obtained by post-curing. Contact ClockSpring|NRI for more information.

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