

Milliken Infrastructure

RenewWrap®

GF360 BD Prepreg

Bi-directional Glass Fiber Pre-impregnated Reinforcing Fabric



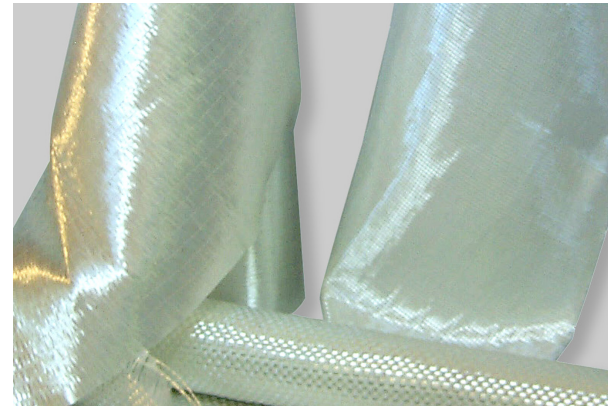
BRIDGES + ROADWAYS



BUILDINGS + PARKING FACILITIES



OIL, GAS + INDUSTRIAL



RenewWrap® GF360 BD is a bi-directional glass fiber reinforcing fabric impregnated with a water-activated polyurethane resin. The RenewWrap GF360 BD FRP strengthening system is used to strengthen and protect existing steel, concrete, masonry, and timber structures. It may be used in splash zones or even under water where confinement is required.

Benefits

- Ready to use
- Can be applied on dry or wet surfaces, even underwater.
- Can be applied at temperatures up to 120 °F but has an operating temperature up to 365 °F
- Up to 30 minutes of working time once package is opened
- Sets within an hour and cures fully after 24 hours
- around and externally bonded to structural elements for additional confinement
- Water-activated curing resin eliminates the need for mixing resins in the field.
- Bi-directional fabric facilitates spiral wrapping

Limitations

- Must be confined with constrictor wrap during cure to prevent formation of delaminations
- Not recommended for bond-critical applications as defined by ACI 440.2R.
- Not recommended for long flat surfaces like the faces of large square or rectangular columns where material cannot be properly constricted during cure.
- Design calculations shall be made and sealed by a licensed, independent engineer knowledgeable with the design of FRP strengthening systems.

Product Designation and Packaging

RenewWrap GF360 BD products are available in various roll sizes. They are supplied in a hermetically sealed bag and available in various widths and roll lengths. Standard products are listed below. Custom roll sizes may be available upon request.

Consult with Milliken Infrastructure to help determine the quantities for your project.

Product Designation	Width (inch)	Length (feet)	Yield (SF/roll)
GF360 BD (4 x 50)	4	50	16.7
GF360 BD (6 x 90)	6	90	45
GF360 BD (12 x 90)	12	90	90

Working Properties	
Working Time	20-30 minutes
Set Time	60 minutes
Cure Time	24 hours

Typical Uses

Recommended for:

- Protection and confinement of marine piling
- Seismic retrofit
- Additional confinement of columns and piers
- Protection of columns
- After removal of constrictor wrap, material may be coated or painted.

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 1 year in unopened packaging.

Caution

Wear appropriate PPE and use caution when handling. SDS are available and should be consulted for additional information.

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Typical Fabric and Fiber Properties¹

PROPERTY	VALUE
Fiber Type	E-Glass
Color	White fibers / light gray resin
Fabric Construction	Bi-directional
Fiber Tensile Strength	500 ksi (3,450 MPa)
Fiber Tensile Modulus	11,700 ksi (80 GPa)
Fiber Rupture Strain	4.0%
Fabric Areal Weight ²	10.5 oz./yd ² (360 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	0.022 in. (0.56 mm)	
Heat Distortion Temperature	400 °F (205 °C)	ASTM D648

Mechanical Properties

PROPERTY	VALUE	METHOD
Tensile Strength	51.8 ksi (357 MPa)	ASTM D3039
Tensile Modulus of Elasticity ²	3.01 Msi (20.7 GPa)	ASTM D3039
Elongation at Break	1.7%	ASTM D3039
Tensile Strength/Unit Width	1.14 kip in./ply (0.19 kN/mm/ply)	ASTM D7565
Tensile Modulus/ Unit Width	66.2 kip/in./ply (11.6 kN/mm/ply)	ASTM D7565

NOTES:

1. The reported thickness is based on measurements made on panels prepared in the laboratory. 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). T_g values based on long term curing at room temperature conditions. Higher T_g values may be obtained by post-curing. Contact Milliken Infrastructure Solutions for more information.

Before using any Milliken Infrastructure Solutions, LLC product, the user must review the most recent version of the product's technical data sheet, material safety data sheet and other applicable documents, available at www.strengtheningsolutions.milliken.com or by calling 1-855-655-6750. LIMITED WARRANTY: Milliken Infrastructure Solutions, LLC is very proud of our innovative RenewWrap™ products (the "Products") and our superior customer service. We hereby warrant to the original purchaser that the Products meet Milliken's standard specifications at the time of delivery from us. If the Products are found to be defective because they do not meet this Warranty, then we will as the sole remedy either (at our option) refund the purchase price for those Products or provide replacement Products (in either case, not including shipping, installation or any other cost). Naturally, we are not responsible or liable for degradation, damage, liability or defect in, or related to, the Products caused by improper storage, use, installation or maintenance, any other party's representations, warranties, actions, or omissions, or acts of God. WE MAKE NO REPRESENTATION OR WARRANTY BEYOND THE EXPLICIT STATEMENTS CONTAINED IN THIS WARRANTY, AND ALL OTHER EXPRESS AND IMPLIED WARRANTIES, INCLUDING WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, INFRINGEMENT, OR ANY WARRANTIES BASED UPON SAMPLES, MODELS, OR SPECIFICATIONS, ARE HEREBY EXPRESSLY DISCLAIMED. NOTWITHSTANDING ANYTHING TO THE CONTRARY, IN NO EVENT SHALL WE BE LIABLE TO THE ORIGINAL PURCHASER OR ANYONE ELSE FOR ANY CONSEQUENTIAL, INDIRECT, SPECIAL, OR EXEMPLARY (OR ANY SIMILAR TYPE OF) DAMAGES RELATED TO THE PRODUCTS. As each customer's use of our Products and situation may be different, information we provide, including without limitation, use or installation suggestions, test results, samples, etc. is provided in good faith but without warranty and without accepting any responsibility or liability. Each customer must test and be responsible for its own specific use, installation, application, etc. All sales are exclusively subject to our standard terms of sale posted at www.milliken.com/terms (all additional/different terms are rejected) unless explicitly agreed otherwise in a signed writing. This Warranty is governed by the laws of the United States and the State of South Carolina, U.S.A. (without giving effect to its conflict of law principles), and any party desiring to take action under this Warranty hereby submits to the exclusive jurisdiction of the courts in such jurisdiction and waive any inconvenient forum claims related thereto. In the unlikely event that you have a warranty issue, please contact your distributor or sales representative to discuss and resolve the matter in accordance with this Warranty.