

PRODUCT DATA

3 03 01 00 Maintenance of Concrete

MBRACE® CF 160

Unidirectional high strength carbon fiber fabric for the MBrace® Composite Strengthening System

Description

MBrace® CF 160 is a dry fabric constructed of very high strength, aerospace grade carbon fibers. These fabrics are applied onto the surface of existing structural members in buildings, bridges, and other structures using the MBrace® family of performance polymers. The result is an externally bonded FRP (fiber reinforced polymer) reinforcement system that is engineered to increase the strength and structural performance of these members. Once installed, the MBrace® System delivers externally bonded reinforcement with outstanding long-term physical and mechanical properties.

MBrace® CF 160 is twice the thickness of MBrace® CF 130. Two layers of MBrace® CF 130 can be replaced with one layer of MBrace® CF 160.

Yield

269 ft² per roll

Packaging

Available in rolls 20 in (500 mm) wide

ROLL	WIDTH	LENGTH
269 ft ² (25 m ²)	20 in (500 mm)	160 ft (50 m)

Color

Black

Features

- High strength to weight ratio
- Excellent resistance to creep and fatigue
- Extremely durable
- Easy installation
- Low aesthetic impact

Benefits

- Can add significant strength to a structure without adding significant dead load
- Withstands sustained and cyclic load conditions
- Extremely resistant to a wide range of environmental conditions
- Can be installed quickly, even in areas of limited access;
- Easy to conceal, will not significantly change existing member dimensions, will form around complex surfaces

Shelf Life

3 years when stored in unopened containers

Storage

Store in a cool, dry area (50 to 90° F [10 to 32° C]) away from direct sunlight, flame, or other hazards

Where to Use

APPLICATION

- Increase load bearing capacity of concrete beams, slabs, walls and columns
- Restore structural capacity to damaged or deteriorated concrete structures
- Increase the strength of concrete pipes, silos, tanks, chimneys and tunnels
- Substitute reinforcing steel mistakenly omitted in the construction of concrete and masonry structures
- Improve the seismic ductility of concrete columns

- Improve the seismic response of concrete beam-column connections, shear walls and in-fill walls
- Improve the blast resistance of concrete and masonry structures
- Strengthening of some steel and timber structures

LOCATION

- Vertical
- Horizontal
- Exterior
- Interior

SUBSTRATE

- Concrete
- Masonry
- Timber
- Steel

Technical Data

Composition

MBrace® CF 160 is composed of a dense network of high strength carbon fibers held in a unidirectional alignment with a light thermoplastic glass fiber cross weave yarn

Physical Properties

PROPERTY	VALUE
Fiber Material	High Strength Carbon
Fiber Tensile Strength MPa]	720 ksi [4950
Areal Weight	0.124 lb/ft ² [600 g/m ²]
Fabric Width	20 in 500 mm
Nominal Thickness, T_fⁿ	0.013 in/ply [0.33 mm/ply]

Functional Properties

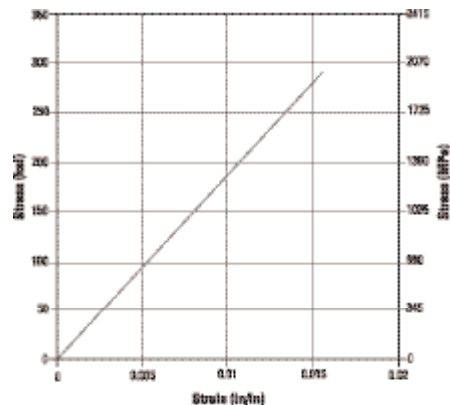
PROPERTY	VALUE
CTE	-0.21·10 ⁻⁶ /° F (-0.38·10 ⁻⁶ /° C)

0° Tensile Properties^(2,3)

PROPERTY	VALUE
Ultimate Tensile Strength, f_{tu}[*]	550 ksi [3800 MPa]
Tensile Modulus, E_f	33000 ksi [227 GPa]
Ultimate Tensile Strength per Unit Width, f_{tu}[*] t_f	7.14 kips/in/ply [1.25 kN/mm/ply]
Tensile Modulus per Unit Width, E_f t_f	430 kips/in/ply [76 kN/mm/ply]
Ultimate Rupture Strain, ε_{tu}[*]	1.67%

90° Tensile Properties^(2,4)

PROPERTY	VALUE
Ultimate Tensile Strength	0
Tensile Modulus	0
Ultimate Rupture Strain	n/a



NOTES:

1. The nominal fabric thickness is based on the total area of fibers (only) in a unit width. From experience, the actual cured thickness of a single ply laminate (fibers plus saturating resins) is 0.040-in to 0.060-in (1.0-mm to 1.5-mm).
2. The tensile properties given are those to be used for design. These values are derived by testing cured laminates (per ASTM D3039) and dividing the resulting strength and modulus per unit width by the nominal fabric thickness.
3. The 0° direction denotes the direction along the length of the fabric.
4. The 90° direction denotes the direction along the width of the fabric.

How to Apply

Surface Preparation

MBrace® CF 160 is applied to surfaces treated with MBrace® Primer, MBrace® Putty and MBrace® Saturant. Consult the data sheets for these materials for additional details.

Application

MBrace® CF 160 is only applied as a component of the MBrace® System.

1. The MBrace® CF 160 material should be cut to the proper dimensions (dimensions will vary based on project requirements) using heavy duty shears or a utility knife.
2. Cut sections of MBrace® CF 160 can be temporarily stored by carefully rolling fabric into a 12 in [600 mm] (approximate) roll. Do not fold or crease the fabric. Fabric should be kept free of dust, oils, moisture, and other contaminants at all times.
3. Apply the MBrace® CF 160 fabric directly into uncured MBrace® Saturant applied on the substrate. There is no need to "pre-wet" the MBrace® CF 160 fabric with MBrace® Saturant prior to applying the fabric against the substrate.
4. Using a rib roller or squeegee, press the fabric against the substrate until visual signs of MBrace® Saturant are observed bleeding through the fabric. The rib roller or squeegee should only be run along the direction of the primary fibers in the fabric.
5. Apply a layer of MBrace® Saturant over the top of the MBrace® CF 160 fabric to completely encapsulate the fabric. Consult with the MBrace® Saturant datasheet on details for applying MBrace® Saturant.

Maintenance

Periodically inspect the applied material and repair localized areas as needed. Consult a BASF representative for additional information. Visit us on the web for the most current product information and news: www.BuildingSystems.BASF.com.

For Best Performance

- Use caution when applying MBrace® CF 160 around sensitive electrical equipment. Carbon fiber filaments can become airborne, infiltrate electrical equipment and cause electrical shorts.
- Make certain the most current versions of product data sheet and MSDS are being used; call Customer Service (1-800-433-9517) to verify the most current version.
- Proper application is the responsibility of the user. Field visits by BASF personnel are for the purpose of making technical recommendations only and are not for supervising or providing quality control on the jobsite.

Health and Safety

MBRACE® CF 160

Warning

MBrace® Fiber Reinforcements contain carbon, glass, and/or aramid fibers, CF 160 contains carbon and glass fibers. While handling MBrace® CF 160, wear appropriate work clothing to minimize contact. Product Material Safety Data Sheets (MSDS) are available and should be consulted and on hand whenever handling these products. These products are for professional and industrial use only and are only installed by trained and qualified applicators. Trained applicators must follow installation instructions.

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