MasterBrace® FIB 600/50 CFS
Unidirectional high strength carbon fiber fabric for the MasterBrace Composite Strengthening System

FORMERLY MBRACE CF 160

DESCRIPTION
MasterBrace FIB 600/50 CFS 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 MasterBrace 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 MasterBrace System delivers externally bonded reinforcement with outstanding long-term physical and mechanical properties. MasterBrace FIB 600/50 CFS is twice the thickness of MasterBrace FIB 300/50 CFS. Two layers of MasterBrace FIB 300/50 CFS can be replaced with one layer MasterBrace FIB 600/50 CFS.

PRODUCT HIGHLIGHTS
- High strength to weight ratio: Can add significant strength to a structure without adding significant dead load
- Excellent resistance to creep and fatigue: Withstands sustained and cyclic load conditions
- Extremely durable: Extremely resistant to a wide range of environmental conditions
- Easy installation: Can be installed quickly, even in areas of limited access;
- Low aesthetic impact: Easy to conceal, will not significantly change existing member dimensions, will form around complex surfaces
- Also available in a bidirectional (0–90°) configuration (Contact BASF Engineering Services for specifications and design assistance.)

SUBSTRATES
- Concrete
- Masonry
- Timber
- Steel

APPLICATIONS
- 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

STORAGE
Store in unopened containers in a clean, dry area between 50 and 90 °F (10 to 32 °C) away from direct sunlight, flame, or other hazards.

YIELD
269 ft² per roll

PACKAGING
Available in rolls 20 in (500 mm) wide, 162 ft (50 m) long

COLOR
Black

SHELF LIFE
3 years when properly stored
**TECHNICAL DATA**

**COMPOSITION**

MasterBrace FIB 600/50 CFS 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.

**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.

### PHYSICAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fiber Material</td>
<td>High Strength Carbon</td>
</tr>
<tr>
<td>Fiber Tensile Strength</td>
<td>720 ksi [4950 MPa]</td>
</tr>
<tr>
<td>Areal Weight</td>
<td>0.124 lb/ft² [600 g/m²]</td>
</tr>
<tr>
<td>Fabric Width</td>
<td>20 in 500 mm</td>
</tr>
<tr>
<td>Nominal Thickness, tF (1)</td>
<td>0.013 in/ply [0.33 mm/ply]</td>
</tr>
</tbody>
</table>

### FUNCTIONAL PROPERTIES

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>CTE</td>
<td>-0.21·10⁻⁶/°F [-0.38·10⁻⁶/°C]</td>
</tr>
</tbody>
</table>

### 90° TENSILE PROPERTIES (2)(4)

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate Tensile Strength</td>
<td>0</td>
</tr>
<tr>
<td>Tensile Modulus</td>
<td>0</td>
</tr>
<tr>
<td>Ultimate Rupture Strain</td>
<td>n/a</td>
</tr>
</tbody>
</table>

### 0° TENSILE PROPERTIES (2)(3)

<table>
<thead>
<tr>
<th>PROPERTY</th>
<th>VALUE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultimate Tensile Strength, f*f</td>
<td>550 ksi [3800 MPa]</td>
</tr>
<tr>
<td>Tensile Modulus, E_f</td>
<td>330000 ksi [227 GPa]</td>
</tr>
<tr>
<td>Ultimate Tensile Strength per Unit Width, f*f</td>
<td>7.14 kips/in/ply [1.25 kN/mm/ply]</td>
</tr>
<tr>
<td>Tensile Modulus per Unit Width, E_f</td>
<td>430 kips/in/ply [76 kN/mm/ply]</td>
</tr>
<tr>
<td>Ultimate Rupture Strain, e_f</td>
<td>1.67%</td>
</tr>
</tbody>
</table>
HOW TO APPLY

SURFACE PREPARATION
MasterBrace FIB 600/50 CFS is applied to surfaces treated with MasterBrace P 3500, MasterBrace F2000 and MasterBrace SAT 4500. Consult the data sheets for these materials for additional details.

APPLICATION
MasterBrace FIB 600/50 CFS is only applied as a component of the MasterBrace.

1. MasterBrace FIB 600/50 CFS 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 MasterBrace FIB 600/50 CFS can be temporarily stored by carefully rolling the 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 contaminates at all times.

3. Apply the MasterBrace FIB 600/50 CFS fabric directly into uncured MasterBrace SAT 4500 applied on the substrate. There is no need to “pre-wet” the MasterBrace FIB 600/50 CFS fabric with uncured MasterBrace SAT 4500 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 uncured MasterBrace SAT 4500 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 uncured MasterBrace SAT 4500 over the top of the MasterBrace FIB 600/50 CFS fabric to completely encapsulate the fabric. Consult with the MasterBrace SAT 4500 datasheet on details for applying MasterBrace SAT 4500.

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 MasterBrace FIB 600/50 CFS 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 SDS 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.

WARNING
MasterBrace Fiber Reinforcements contain carbon, glass, and/or aramid fibers. MasterBrace FIB 600/50 CFS contains carbon and glass fibers. While handling MasterBrace FIB 600/50 CFS, wear appropriate work clothing to minimize contact. Product Safety Data Sheets (SDS) 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.

HEALTH, SAFETY AND ENVIRONMENTAL

Health, Safety and Environmental Read, understand and follow all Safety Data Sheets and product label information for this product prior to use. The SDS can be obtained by visiting www.master-builders-solutions.basf.us, e-mailing your request to basfbscst@basf.com or calling 1(800)433-9517. Use only as directed. For medical emergencies only, call ChemTrec® 1(800)424-9300.
LIMITED WARRANTY NOTICE
Every reasonable effort is made to apply BASF exacting standards both in the manufacture of our products and in the information which we issue concerning these products and their use. We warrant our products to be of good quality and will replace or, at our election, refund the purchase price of any products proved defective. Satisfactory results depend not only upon quality products, but also upon many factors beyond our control. Therefore, except for such replacement or refund, BASF MAKES NO WARRANTY OR GUARANTEE, EXPRESS OR IMPLIED, INCLUDING WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY, RESPECTING ITS PRODUCTS, and BASF shall have no other liability with respect thereto. Any claim regarding product defect must be received in writing within one (1) year from the date of shipment. No claim will be considered without such written notice or after the specified time interval. User shall determine the suitability of the products for the intended use and assume all risks and liability in connection therewith. Any authorized change in the printed recommendations concerning the use of our products must bear the signature of the BASF Technical Manager.

This information and all further technical advice are based on BASF’s present knowledge and experience. However, BASF assumes no liability for providing such information and advice including the extent to which such information and advice may relate to existing third party intellectual property rights, especially patent rights. In particular, BASF disclaims all CONDITIONS AND WARRANTIES, WHETHER EXPRESS OR IMPLIED, INCLUDING THE IMPLIED WARRANTIES OF FITNESS FOR A PARTICULAR PURPOSE OR MERCHANTABILITY. BASF SHALL NOT BE RESPONSIBLE FOR CONSEQUENTIAL, INDIRECT OR INCIDENTAL DAMAGES (INCLUDING LOSS OF PROFITS) OF ANY KIND. BASF reserves the right to make any changes according to technological progress or further developments. It is the customer’s responsibility and obligation to carefully inspect and test any incoming goods. Performance of the product(s) described herein should be verified by testing and carried out only by qualified experts. It is the sole responsibility of the customer to carry out and arrange for any such testing. Reference to trade names used by other companies is neither a recommendation, nor an endorsement of any product and does not imply that similar products could not be used.

FOR PROFESSIONAL USE ONLY. NOT FOR SALE TO OR USE BY THE GENERAL PUBLIC.