

VELACARB 600U

EDGE
STRUCTURAL
COMPOSITES

UNIDIRECTIONAL CARBON FIBER FABRIC FOR STRUCTURAL STRENGTHENING

DESCRIPTION

VelaCarb 600U is a Pan based dry, unidirectional carbon fiber fabric that is field-impregnated with **Veloxx LR** laminating resin to create a carbon fiber reinforced polymer (CFRP) laminate. **VelaCarb** fabrics are produced under ISO 9002 standards.

VelaCarb 600U is a patented part of the FiberBond™ Strengthening System, a highly engineered product for strengthening concrete and masonry structures.

For most applications **VelaCarb 600U** is a proven cost effective alternative to traditional strengthening techniques.



GENERAL INFORMATION

Color	Black
Primary Fiber Direction	0° (unidirectional)
Flame Spread Index ⁽¹⁾ (ASTM E84)	25 (Class 1)

TYPICAL FIBER PROPERTIES

Fabric areal weight density	18 oz/yd ²	600 g/m ²
Fabric thickness per ply ⁽²⁾	0.00689 in ² per in	1.75 cm ² per m
Tensile Strength	650,000 psi	4,480 MPa
Modulus of Elasticity	34x10 ⁶ psi	234,400 MPa
Elongation at Break	1.9%	1.9%

CURED LAMINATE PROPERTIES FOR DESIGN

Average thickness per ply	0.050 in	1.27 mm
Tensile Strength ⁽³⁾ (ASTM D3039)	140,000 psi	966 MPa
Modulus of Elasticity (ASTM D3039)	10.1 x 10 ⁶ psi	70,000 N/mm ²
Elongation at Break ⁽³⁾ (ASTM D3039)	1.2%	1.2%
Strength per unit width (per ply)	7000 lbs/in	1217 kN/m
Shear Bond Strength (Concrete failure)	680 psi	4-68 N/mm ²

- Notes: (1) Tests conducted on fully cured samples of **VelaCarb 600U** without a protective coating.
 (2) Fabric thickness is based on the area of fibers.
 (3) Properties are statistically based and can be used for design without further reductions.

USE VELACARB 600U FOR:**Flexural Strengthening**

- Beams, joists, girders.
- One-way and two-way slabs.
- Columns.
- Walls.

Shear Strengthening

- Beams, columns, walls.
- Diaphragms.

Tensile Strengthening

- Silos, tanks, bins.
- Pipes.
- Chimneys.

Ductility Enhancement (Seismic)

- Columns, beams.
- Beam-column joints.

Serviceability

- Crack control.
- Fatigue.
- Reduced deflections.

USE VELACARB 600U TO ADDRESS:**Increased Loads**

- Increased floor live loads in buildings and warehouses (e.g. filing systems).
- Increased vehicular live loads on bridges.

Damage and Deterioration

- Corrosion-related section loss of reinforcing steel or post-tensioning tendons.
- Vehicle impact.

Seismic Retrofit

- Insufficient shear strength.
- Improper reinforcing steel details.
- Enhanced ductility.

Design/Construction Defects

- Insufficient reinforcing steel or post-tensioning tendons.

Other

- Cut reinforcing steel around slab openings.
- Restoration of historic structures.
- Blast upgrades.

ADVANTAGES

- High strength.
- Lightweight, can be installed without heavy equipment.
- Can be used on both, reinforced and prestressed concrete structures.
- Class I flame spread classification (ASTM E84), can be used in all building types.
- Durable, highly resistant to aggressive environments.

- Flexible, fabric can be wrapped around structural elements.
- Woven fabric is ideally suited for construction sites, fibers will not fray or separate under normal handling.
- Thin, minimal aesthetic impact.
- Can be applied dry or pre-impregnated with resin.
- Economical, installed costs competitive with traditional alternates.

LIMITATIONS

- All applications of **VelaCarb 600U** should be evaluated and designed by a licensed engineer.
- All installations of **VelaCarb 600U** should be inspected by a qualified independent testing agency.
- **VelaCarb 600U** should not be used when the operating temperature exceeds 160 °F (70 °C) unless special precautions are taken to insulate the system.
- Substrate strength for bond-critical applications should exceed 200 psi.
- System is a vapor barrier. Avoid completely encapsulating concrete in areas where freeze/thaw is likely to occur.

PACKAGING

Available in 6", 12", 24" & 48" width x 100yds rolls.

STORAGE AND HANDLING

Store in a dry area at 40-90°F (4-32°C) away from direct sunlight, flame, or other hazards. When properly stored the product has an indefinite shelf life.

INSTALLATION

Detailed installation procedures for **VelaCarb 600U** are outlined in the FiberBond™ Installation Manual. Installation of VelaCarb 335U should only be performed by contractors trained and certified by EDGE STRUCTURAL COMPOSITES.

SAFETY

Product material safety data sheets (MSDS) should be consulted during application of or when handling this product.

VelaCarb 600U contains carbon fibers. Carbon fibers are conductive and special precautions should be taken when using this product around electric tools and machinery.

RELATED PRODUCTS

The following products are typically used with **VelaCarb 600U**:

- **Veloxx LR** Laminating Resin
- **Veloxx LVP** Low Viscosity Primer
- **Veloxx AP** Adhesive Paste/Filler
- **Velacoat** Top Coats
- **Velanchor** Anchors

DISCLAIMER/WARRANTY STATEMENT

Data reported are based on testing conducted at independent testing agencies. EDGE STRUCTURAL COMPOSITES reserves the right to change or modify, at its discretion, and without prior notice, any of the information contained in this document.

EDGE STRUCTURAL COMPOSITES warrants this product to be free of manufacturing defects and that it will meet the current published properties when applied per EDGE's installation procedure and tested in accordance with ASTM standards. The user determines the suitability for use of this product assumes all risk associated with its use.

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