V-Wrap C100 High Strength Carbon Fiber

Typical Data for V-Wrap C100

Storage Conditions:	Store dry at 40°F – 95°F
Color:	Black
Primary Fiber Direction:	0° (unidirectional)
Weight per Square Yard:	9 oz (300 g/m^2)
Shelf life:	10 years

Fiber Properties (Dry)

Tensile Strength:	650,000 psi (4,480 MPa)
Tensile Modulus:	33.7 x 10^6 psi (232,000 MPa)
Elongation:	2.0 %

Fiber Properties (Laminated)	**Average Value** (1)	**Design Value** (2)
Tensile Strength:	630,000 psi (4,340 MPa)	600,000 psi (4,140 MPa)
Tensile Modulus:	33 x 10^6 psi (227,500 MPa)	32 x 10^6 psi (213,700 MPa)
Elongation:	1.9 %	1.65 %
Thickness:	0.0065 in. (0.17 mm)	0.0065 in. (0.17 mm)

Cured Laminate Properties	**Average Value** (1)	**Design Value** (2)
Tensile Strength:	165,000 psi (1,140 MPa)	135,000 psi (931 MPa)
Modulus of Elasticity:	8 x 10^6 psi (55,150 MPa)	7 x 10^6 psi (46,260 MPa)
Elongation at Break:	1.9 %	1.65%
Thickness:	0.027 in. (0.69 mm)	0.027 in. (0.69 mm)
Strength per Inch Width:	4,450lbs./layer (19.8 kN)	3,650 lbs./layer (16.2 kN)

(1) Typical average test values per ASTM 3039.
(2) Design values calculated per Section 3.3 of ACI 440.2R as: Average – 3 X Standard Deviation.

DESCRIPTION:
V-Wrap C100 is a unidirectional carbon fiber fabric with fiber oriented in the 0° direction. V-Wrap C100 system is field laminated using V-Wrap environmentally friendly, styrene-free resin systems, a two-component 100% solids, high strength structural adhesives to form a carbon fiber reinforced polymer (CFRP) system used to reinforce structural elements.

WHERE TO USE:
V-Wrap strengthening systems can be used to resolve strength deficiencies and increase the load carrying capacity of building, bridges, silos, chimneys, and other structures.

Loading increases
- Increasing the live loads capacity of floor systems
- Increasing shear and flexural strengths of reinforced and prestressed beams
  Increasing the axial capacity of columns
- Increasing the live load capacity of parking garages

Seismic strengthening
- Column confinement for ductility improvement
- Masonry and concrete shear walls strengthening

Damage to structural parts
- Correct strength deficiency due to deterioration and corrosion
- Restore strength of structural elements damaged by fire

Change in structural system
- Load redistribution due to removal of walls, beams or columns
- Removal of slab sections for new openings

Design or construction defects
- Insufficient amount of shear or flexural reinforcement
  Insufficient size and/or layout of reinforcement
- Insufficient reinforcing bar or lap splice length
  Low compressive strength in beams, slabs, and columns.

ADVANTAGES:
- Styrene-free
- 100% Solvent free
- Non-corrosive reinforcement system
- Lightweight flexible fabric can be wrapped around complex shapes
- Used for shear, confinement or flexural strengthening
- High strength
- Light weight
- Reduces crack width
- Alkali resistant
- Low aesthetic impact

PACKAGING:
Fabric: 24 in. x 150 ft. [300 ft^2] Rolls (Approx.)

V-Wrap C100 High Strength Carbon Fiber

HOW TO USE:

Design:
Design should comply with ACI 440.2R or recognized design/ specification entity, and is typically based on CFRP contribution determined by detailed analysis. Design values will vary based on project requirements and applicable environmental and strength reduction factors. Contact VSL Engineers to determine applicable design factors.

Surface Preparation:
Surfaces to receive V-Wrap C100 must be clean and sound. It must be dry and free of frost. All dust, laitance, grease, curing compounds, waxes, deteriorated materials, and other bond inhibiting materials must be removed from the surface prior to application. Existing uneven surfaces must be filled with appropriate V-Wrap putty filler or repair mortar. Sandblast, pressure wash, shotblast, grind or use other approved mechanical means to achieve an open-pore texture with a concrete surface profile of CSP 3 or better (ICRI). In certain applications and at the engineer's discretion, the bond between the substrate and the fabric may be determined to be non-critical (such as in column confinement applications). All corners must be rounded to ½" radius minimum. A minimum overlap [or lap splice] of 6" is required to achieve continuity. The adhesive strength of the concrete may be verified after surface preparation by random pull-off testing (ACI 440.3R or ASTM 4551) at the discretion of the engineer. Minimum tensile strength of 200 psi must be achieved.

Cutting V-Wrap C100:
Fabric can be cut to appropriate length by using a commercial quality heavy-duty scissors.

Application:
Installation of the V-Wrap C100 strengthening system should be performed only by a specially trained, approved contractor.

Note specified the number of plies, ply widths, and fiber orientation. Mix resin components using recommended procedures on product datasheet. Apply one coat of V-Wrap 700 resin as a primer to the surface using a nap roller. If required, fill minor concrete defects such as bug holes and other imperfections with V-Wrap 700 fumed with silica. As a tack coat, apply one coat of the thickened V-Wrap 700 using a roller or trowel to primed surface. Adjust the gap between saturator rollers to approximately 20 mils. Using a saturator machine, pre-saturate the appropriate length of V-Wrap C100 with V-Wrap 700 resin as a saturant. Install the saturated FRP sheet into the uncured coat of V-Wrap 700. Use a rib roller to remove all air pockets and ensure intimate contact with the surface. If a splice is needed, a minimum 6 inch overlap is required. On multiple plies with splices, stagger the splice locations. If required, apply topcoat material.

Limitations:
- Design calculations must be approved by licensed professional engineer.
- System is a vapor barrier.
- Concrete deterioration and steel corrosion must be resolved prior to application.
- Minimum application temperature is 40°F.

STORAGE:
Store material in a cool, dark space. Low humidity is recommended.

HANDLING:
Use of approved personal protection equipment should be worn at all times. Particle mask is recommended for possible airborne particles. Gloves are recommended when handling fabrics and resins to avoid skin irritation. Safety glasses are recommended to prevent eye irritation. Wear chemical resistant clothing/gloves/ goggles. Ventilate area. In absence of adequate ventilation, use properly fitted NIOSH respirator.

CLEANUP:
Dispose of material in accordance with local disposal regulations. Uncured material can be removed with approved solvents. Cured materials can only be removed mechanically

FIRST AID:
Skin contact: No special measures required.

Eye contact: Flush immediately with plenty of water for at least 15 minutes; contact physician immediately.

Inhalation: Remove person to fresh air: contact a physician.

VStructural LLC. warrants its products to be free from manufacturing defects and to meet VSL's current published properties when applied in accordance with VSL directions and tested in accordance with ASTM and VSL Standards. User determines suitability of product for use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product and excludes labor or the cost of labor. Any claim for breach of this warranty must be brought within one year of the date of purchase.

No other warranties expressed or implied including any warranty of merchantability or fitness for a particular purpose shall apply. VStructural LLC. shall not be liable for any consequential or special damages of any kind, resulting from any claim or breach of warranty, breach of contract, negligence or any legal theory. VStructural LLC. assumes no liability for use of this product in a manner to infringe on another's patent.