Strengthening Solutions

V-Wrap™ C100H

High Strength Carbon Fiber Fabric

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Typical Data for V-Wrap C100H

Storage Conditions:	Store dry at 40°F – 90°F (4°C – 32°C)
Color:	Black
Primary Fiber Direction:	0° (unidirectional)
Weight per Square Yard:	9.7 oz/yd² (330 g/m²)
Shelf life:	10 years

Fiber Properties (Dry)

Tensile Strength:	700,000 psi (4,830 MPa)
Tensile Modulus:	33 x 10^6 psi (227,500 MPa)
Elongation:	2.1 %

Cured Laminate Properties	Average Values	Design Values (1)
Tensile Strength:	198,000 psi (1,365 MPa)	165,000 psi (1,138 MPa)
Modulus of Elasticity:	11.0 x 10^6 psi (75,842 MPa)	11.0 x 10^6 psi (75,842 MPa)
Elongation at Break:	1.8%	1.5%
Thickness:	0.02 in. (0.508 mm)	0.02 in. (0.508 mm)
Strength per Inch Width:	3,960 lbs. (17.6 kN)	3,300 lbs. (14.7 kN)

1. Design properties are based on ACI 440.2R using average minus three standard deviations.

Description:

V-Wrap C100H is a unidirectional carbon fiber fabric with fiber oriented in the 0° direction. V-Wrap C100H system is field laminated using environmentally friendly, two-part 100% solids and high strength structural adhesives to form a carbon fiber reinforced polymer (CFRP) system used to reinforce structural elements.

Product Uses:

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:

- ICC-ES ESR-3606 listed product
- 0% VOC
- 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. width x 300 ft rolls
0.61 m width x 91 m rolls

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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 STRUCTURAL TECHNOLOGIES to determine applicable design factors.

Surface Preparation:

Surfaces to receive V-Wrap C100H 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 epoxy putty or repair mortar. Use abrasive blasting, pressure wash, shotblast, grind or 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 1/2" 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 (ASTM D7522) at the discretion of the engineer. Minimum tensile strength of 200 psi must be achieved.

Cutting V-Wrap C100H:

Fabric can be cut to appropriate length by using a commercial quality heavy-duty scissors.

Application:

Installation of the V-Wrap C100H strengthening system should be performed only by a specially trained, approved contractor. The V-Wrap C100H strengthening system shall consist of V-Wrap C100H carbon fabric and V-Wrap epoxy resins such as: V-Wrap 600, V-Wrap 700S, and V-Wrap 770.

Note the specified number of plies, ply widths, and fiber orientation. Mix resin components using recommended procedures on product datasheet. Apply one coat of V-Wrap epoxy as a primer to the surface using a nap roller. Fill minor concrete defects such as bug holes and other imperfections using V-Wrap 770 epoxy mixed with fumed silica (thickened epoxy) or V-Wrap PF putty. Apply thickened epoxy or putty using a roller or trowel to prime surface. Adjust the gap between saturator rollers to approximately 20 mils. Using a saturator machine, pre-saturate the appropriate length of V-Wrap C100H with V-Wrap 770 adhesive as a saturant. Install the saturated FRP sheet. 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 a 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:

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:

In case of skin contact, wash thoroughly with soap and water. For eye contact, flush immediately with plenty of water; contact physician immediately. For respiratory problems, remove to fresh air. Wash clothing before reuse.