

ICC <b>ES</b>	✓	ICC	ESR-3288
	✓	IBC	2015 Compliance

# SikaWrap® Hex 103C HM

High modulus carbon fiber fabric for structural strengthening

Construction

<b>Description</b>	SikaWrap® Hex 103C HM is a high modulus, unidirectional carbon fiber fabric. Material is field laminated using Sikadur® Hex 300 epoxy to form a carbon fiber reinforced polymer (CFRP) used to strengthen structural elements.
<b>Where to Use</b>	<p><b>Load Increases</b></p> <ul style="list-style-type: none"> <li>■ Increasing the live loads</li> <li>■ Increasing traffic volumes on bridges</li> <li>■ Installation of heavy machinery in industrial buildings</li> <li>■ Vibrating structures</li> <li>■ Changes of building utilization</li> </ul> <p><b>Seismic Strengthening</b></p> <ul style="list-style-type: none"> <li>■ Column wrapping</li> <li>■ Masonry walls</li> </ul> <p><b>Damage to Structural Parts</b></p> <ul style="list-style-type: none"> <li>■ Aging of construction materials</li> <li>■ Vehicle impact</li> <li>■ Fire</li> <li>■ Blast Resistance</li> </ul> <p><b>Change in Structural System</b></p> <ul style="list-style-type: none"> <li>■ Removal of walls or columns</li> <li>■ Removal of slab sections for openings</li> </ul> <p><b>Design or Construction Defects</b></p> <ul style="list-style-type: none"> <li>■ Insufficient reinforcement</li> <li>■ Insufficient structural depths</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>■ Approved by ICC ESR-3288</li> <li>■ Used for shear, confinement or flexural strengthening</li> <li>■ Flexible, can be wrapped around complex shapes</li> <li>■ High Strength</li> <li>■ Light Weight</li> <li>■ Non-corrosive</li> <li>■ Alkali Resistant</li> <li>■ Low Aesthetic Impact</li> </ul>
<b>Packaging</b>	<b>Rolls:</b> 20" x 150'

### Typical Data (Material and curing conditions @ 73°F and 50% R.H.)

RESULTS MAY DIFFER BASED UPON STATISTICAL VARIATIONS DEPENDING UPON MIXING METHODS AND EQUIPMENT, TEMPERATURE, APPLICATION METHODS, TEST METHODS, ACTUAL SITE CONDITIONS AND CURING CONDITIONS.

<b>Storage Conditions</b>	Store dry at 40°-95°F (4°-35°C)
<b>Shelf Life</b>	10 years
<b>Color</b>	Black
<b>Primary Fiber Direction</b>	0° (unidirectional)
<b>Areal Weight</b>	18 osy (611 gsm)



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## Typical Dry Fiber Properties

Property	Typical Test Value
Tensile Strength	830 ksi (5,720 MPa)
Tensile Modulus	43 msi (296 GPa)
Elongation at Break	1.90%
Areal Weight	18 osy (611 gsm)
Density	0.064 lb./in. <sup>3</sup> (1.8 g/cm <sup>3</sup> )
Nominal Fiber Thickness	0.0135 in. (0.34 mm)
Fiber Direction	Unidirectional

## Cured Laminate Properties

Property	Average Ultimate Value	Design Value	ASTM Method
Tensile Strength	173.6 ksi (1,197 MPa)	152 ksi (1,048 MPa)*	D3039
Tensile Modulus ( $E_t$ )		13.5 msi (93.1 GPa)	D3039
Tensile % Elongation	1.29%	1.05%*	D3039
Nominal laminate thickness		0.04 in. (1.0 mm)	
Tensile strength per unit width		6.1 kips/in./ply	D7565
Stiffness ( $E_t \cdot A$ ) per unit width		540 kips/in./ply	D7565

\*Average ultimate value minus 3 standard deviations

### How to Use

#### Surface Preparation

Surface must be clean and sound. It may be dry or damp, but free of standing water and frost. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, disintegrated materials, and other bond inhibiting materials from the surface. Existing uneven surfaces must be filled with an appropriate repair mortar. The adhesive strength of the concrete must be verified after surface preparation by random pull-off testing (ASTM D4541) at the discretion of the engineer. Minimum tensile strength, 200 psi with concrete substrate failure.

**Concrete** - Blast clean, shotblast or use other approved mechanical means to provide an open, roughened texture. In certain applications and at the engineer's discretion, the intimate contact between the substrate and the fabric may be determined to be non-critical. In these cases, a thorough cleaning of the substrate using low pressure sand or water blasting is sufficient. Round all corners to min. 1/2" radius.

#### Mixing

Consult Sikadur® Hex 300/330 data sheet for information on epoxy resin.

#### Application

Prior to placing the fabric, the concrete surface is primed and sealed using Sikadur® Hex 300 epoxy. Material may be applied by spray, brush or roller. SikaWrap® Hex 103C HM can be impregnated using Sikadur® Hex 300 epoxy. For best results on larger projects, the impregnation process should be accomplished using a mechanically driven saturator or similar device. In special cases where the size of the project does not justify the use of a saturator, the fabric may saturate by hand using a ruller prior to placement. In either case, installation of this system should be performed only by a specially trained and approved contractor.

For overhead and vertical applications, prime concrete with Sikadur® 30 or Sikadur® 330 to improve tack. Saturate fabric with Sikadur® Hex 300. Coat the exposed surface of final fabric layer using Sikagard® 670W or Sikagard® 62.



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# Construction

<b>Tooling &amp; Finishing</b>	Fabric can be cut to appropriate length by using a commercial quality, heavy duty scissor. Since dull or worn cutting implements can damage, weaken or fray the fiber their use should be avoided.
<b>Limitations</b>	<ul style="list-style-type: none"><li>■ <b>DESIGN CALCULATIONS MUST BE MADE AND CERTIFIED BY AN INDEPENDENT LICENSED PROFESSIONAL ENGINEER.</b></li><li>■ <b>SYSTEM IS A VAPOR BARRIER. CONCRETE SHOULD NOT BE FULLY ENCAPSULATED IN AREAS OF FREEZE/THAW.</b></li><li>■ <b>DO NOT PLACE CARBON FIBER IN DIRECT CONTACT WITH STEEL. MUST BE ISOLATED (E.G. GLASS FABRIC) TO PROTECT AGAINST CORROSION.</b></li></ul>

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KEEP CONTAINER TIGHTLY CLOSED. KEEP OUT OF REACH OF CHILDREN. NOT FOR INTERNAL CONSUMPTION. FOR INDUSTRIAL USE ONLY. FOR PROFESSIONAL USE ONLY.

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