


|  |   |     |                 |
|--|---|-----|-----------------|
|  | ✓ | ICC | ESR-3288        |
|  | ✓ | IBC | 2012 Compliance |

# SikaWrap® Hex 103C

## Carbon fiber fabric for structural strengthening

**Description** SikaWrap® Hex 103C is a high strength, unidirectional carbon fiber fabric. Material is field laminated using Sikadur® 300 or Sikadur® Hex 300 epoxy to form a carbon fiber reinforced polymer (CFRP) used to strengthen structural concrete elements.

**Where to Use**

**Load Increases**

- Increased live loads
- Increased traffic volumes on bridges
- Installation of heavy machinery in industrial buildings
- Vibrating structures
- Changes of building utilization

**Seismic Strengthening**

- Column wrapping
- Masonry walls

**Damage to Structural Parts**

- Aging of construction materials
- Vehicle impact
- Fire
- Blast resistance

**Change in Structural System**

- Removal of walls or columns
- Removal of slab sections for openings

**Design or Construction Defects**

- Insufficient reinforcements
- Insufficient structural depth

**Advantages**

- Approved by ICC ESR-3288
- Compliance with 2012 IBC
- Compliance with 2010 California Building Code
- Component of UL listed, fire-rated assembly
- Used for shear, confinement or flexural strengthening
- Flexible, can be wrapped around complex geometries
- High Strength
- Light Weight
- Non-corrosive
- Alkali Resistant
- Low aesthetic impact

**Packaging** **Rolls:** 25 in. x 50 ft.; 25 in. x 300 ft.

### Typical Data

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 oz./sq.yd. (618 g/m <sup>2</sup> ) |

Construction



PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

## TYPICAL FIBER PROPERTIES

| Property                | Typical Test Value                    |
|-------------------------|---------------------------------------|
| Tensile Strength        | 5.5 x 10 <sup>5</sup> psi (3,793 MPa) |
| Tensile Modulus         | 34 x 10 <sup>6</sup> (234,500 MPa)    |
| Elongation              | 1.5%                                  |
| Density                 | 0.065 lbs./in <sup>3</sup> (1.8 g/cc) |
| Nominal Fiber Thickness | 0.0135 in. (0.34 mm)                  |

| Cured Laminate Properties with Sikadur 300/Sikadur Hex 300 Epoxy |                     |          |                             |          |                  |
|--|---------------------|----------|-----------------------------|----------|------------------|
| Property   | Avg. Ultimate Value |          | Design Value                |          | ASTM Test Method |
|  | US Units            | SI Units | US Units                    | SI Units |                  |
|  | psi                 | MPa      | psi                         | MPa      |                  |
| Tensile Strength   | 180,000             | 1,241    | (f <sub>tu</sub> ) 153,000* | 1,055*   | D3039/D7565      |
| Tensile Modulus  | -                   | -        | (E <sub>t</sub> ) 9,400,000 | 64,828   | D3039/D7565      |
| Tensile % Elongation   | 1.6                 | 1.6      | (ε <sub>tu</sub> ) 1.0*     | 1.0*     | D3039/D7565      |
| 140°F - Tensile Strength   | 123,000             | 848      | 90,600*                     | 625*     | D3039            |
| 140°F - Tensile Modulus  | -                   | -        | 9,156,500*                  | 63,148*  | D3039            |
| 140°F - % Elongation   | 1.13                | 1.13     | 0.89*                       | 0.89*    | D3039            |
| Compressive Strength   | 113,000             | 779      | 99,200*                     | 684*     | D695             |
| Compressive Modulus  | 9,726,000           | 67,076   | 8,532,800*                  | 58,847*  | D695             |
| 90 deg Tensile Strength  | 3,500               | 24       | 1,700*                      | 12*      | D3039            |
| 90 deg Tensile Modulus   | 705,500             | 4,866    | 512,300*                    | 3,533*   | D3039            |
| 90 deg % Tensile Elongation                                      | 0.45                | 0.45     | 0.27*                       | 0.27*    | D3039            |
| Shear Strength +/- 45 in plane                                   | 7,500               | 52       | 6,300*                      | 43*      | D3518            |
| Shear Modulus +/- 45 in plane                                    | 362,500             | 2,500    | 340,000*                    | 2,345*   | D3518            |
| Nominal Ply Thickness (in./mm)                                   | 0.04                | 1.016    | 0.04                        | 1.016    | -                |
| Tensile Strength per in. width                                   | 7.2 kips/in. width  | -        | 6.1 kips/in. width*         | -        | -                |
| Stiffness (E <sub>t</sub> *A) per in. width                      | -                   | -        | 376 kips/in. width          | -        | -                |

\* 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. Consult the current product data sheets for Sikadur® 300, Sikadur® 301, Sikadur® 330 US and/or Sikadur® Hex 300/Sikadur® Hex 306 for additional information on surface preparation.

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 D-4541) at the discretion of the engineer. Minimum tensile strength, 200 psi (1.4 MPa) with concrete substrate failure.

**Preparation Work: Concrete** - Blast clean, shotblast or use other approved mechanical means to provide a roughened, open-textured surface.

Round all corners to 1/2" radius in certain "contact critical" applications and at the engineers discretion, a thorough cleaning of the substrate using low pressure sand or water blasting may be sufficient.

#### Mixing

Consult the current product data sheets for Sikadur® 300, Sikadur® 301, Sikadur® 330 US and/or Sikadur® Hex 300/Sikadur® Hex 306 for information on epoxy resins.



PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.

|                                |  |
|--------------------------------|--|
| <b>Application</b>             | Prior to placing the fabric, the concrete surface is primed and sealed using Sikadur® 300, Sikadur® 301, Sikadur® 330 US and/or Sikadur® Hex 300/Sikadur® Hex 306 epoxy. For overhead or vertical applications, prime concrete with Sikadur® 330 US or Sikadur® Hex 306 to improve tack. SikaWrap® Hex 103C can be impregnated using either the Sikadur® 300, Sikadur® Hex 300 or Sikadur® 301. On larger projects, the impregnation process for Sikadur® 300 and Sikadur® Hex 300 may be accomplished using a mechanically driven fabric saturator similar device. The fabric may also be manually saturated by hand for Sikadur® 300, Sikadur® Hex 300 and Sikadur® 301 using a roller prior to placement. In either case, installation of this system should be performed only by a specially trained contractor. |
| <b>Tooling &amp; Finishing</b> | Fabric can be cut to appropriate lengths by using a commercial quality heavy duty scissor. Since the dull or worn cutting implements can damage, weaken or fray the fabric, their use should be avoided.   |
| <b>Limitations</b>             | <ul style="list-style-type: none"> <li>■ Design calculations must be made and certified by an independent licensed professional engineer.</li> <li>■ System is a vapor barrier. Concrete should not be fully encapsulated in areas of freeze/thaw.</li> <li>■ On projects governed by ICC regulations, use products listed on ESR-3288</li> <li>■ Do not place carbon fiber in direct contact with steel. Must be isolated (e.g. glass fabric) to protect against corrosion.</li> </ul>  |

**PRIOR TO EACH USE OF ANY SIKA PRODUCT, THE USER MUST ALWAYS READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS ON THE PRODUCT'S MOST CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET WHICH ARE AVAILABLE ONLINE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING SIKA'S TECHNICAL SERVICE DEPARTMENT AT 800.933.7452 NOTHING CONTAINED IN ANY SIKA MATERIALS RELIEVES THE USER OF THE OBLIGATION TO READ AND FOLLOW THE WARNINGS AND INSTRUCTIONS FOR EACH SIKA PRODUCT AS SET FORTH IN THE CURRENT PRODUCT DATA SHEET, PRODUCT LABEL AND SAFETY DATA SHEET PRIOR TO PRODUCT USE.**

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

For further information and advice regarding transportation, handling, storage and disposal of chemical products, users should refer to the actual Safety Data Sheets containing physical, ecological, toxicological and other safety related data. Read the current actual Safety Data Sheet before using the product. In case of emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

Prior to each use of any Sika product, the user must always read and follow the warnings and instructions on the product's most current Product Data Sheet, product label and Safety Data Sheet which are available online at <http://usa.sika.com/> or by calling Sika's Technical Service Department at 800-933-7452. Nothing contained in any Sika materials relieves the user of the obligation to read and follow the warnings and instruction for each Sika product as set forth in the current Product Data Sheet, product label and Safety Data Sheet prior to product use.

SIKA warrants this product for one year from date of installation to be free from manufacturing defects and to meet the technical properties on the current Product Data Sheet if used as directed within shelf life. User determines suitability of product for intended use and assumes all risks. Buyer's sole remedy shall be limited to the purchase price or replacement of product exclusive of labor or cost of labor. NO OTHER WARRANTIES EXPRESS OR IMPLIED SHALL APPLY INCLUDING ANY WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. SIKA SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR SPECIAL OR CONSEQUENTIAL DAMAGES. SIKA SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHTS HELD BY OTHERS. SALE OF SIKA PRODUCTS ARE SUBJECT SIKA'S TERMS AND CONDITIONS OF SALE AVAILABLE AT [HTTP://USA.SIKA.COM/](http://usa.sika.com/) OR BY CALLING 201-933-8800.

Visit our website at [usa.sika.com](http://usa.sika.com)

1-800-933-SIKA NATIONWIDE

**Regional Information and Sales Centers.** For the location of your nearest Sika sales office, contact your regional center.

**Sika Corporation**  
201 Polito Avenue  
Lyndhurst, NJ 07071  
Phone: 800-933-7452  
Fax: 201-933-6225

**Sika Canada Inc.**  
601 Delmar Avenue  
Pointe Claire  
Quebec H9R 4A9  
Phone: 514-697-2610  
Fax: 514-694-2792

**Sika Mexicana S.A. de C.V.**  
Carretera Libre Celaya Km. 8.5  
Fracc. Industrial Balvanera  
Corregidora, Queretaro  
C.P. 76920  
Phone: 52 442 2385800  
Fax: 52 442 2250537

