

SikaWrap® Hex 115C

Bi-directional carbon fiber fabric for structural strengthening

Description SikaWrap Hex 115C is a bi-directional, high strength, carbon fiber fabric. Material is field laminated using Sikadur Hex 300/Hex 300 or Sikadur 301 epoxy to form a carbon fiber reinforced polymer (CFRP) used to strengthen structural elements.

Where to Use

Load increases

- Increased live loads in warehouses
- 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

- Used for shear, confinement or flexural strengthening.
- Flexible, can be wrapped around complex shapes.
- High strength.
- Light weight.
- Non-corrosive.
- Alkali resistant.
- Low aesthetic impact.

Packaging

Rolls: 50 in. x 300 ft.

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 Sikadur 300, Sikadur 301, Sikadur Hex 300 and Sikadur 330 technical data sheets for additional information on surface preparation.

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.

Storage Conditions	Store dry at 40°-95°F (4°-35°C)
Color	Black
Primary Fiber Direction	0°/90° (bi-directional)
Weight Per Square Yard	19.8 oz. (675 g/m ²)

Fiber Properties

Tensile Strength	5.5 x 10 ⁵ psi (3,793 MPa)
Tensile Modulus	33 x 10 ⁶ psi (234,500 MPa)
Elongation	4%
Density	0.065 lbs./in. ³ (1.8 g/cc)



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Construction

Cured Laminate Properties with Sikadur Hex 300 Epoxy
 Properties after standard cure followed by standard post cure.
 [70°-75°F (21°-24°C) - 5 days and 48 hour post cure at 140°F (60°C)]

Property	Average Value ¹		Design Value ²		ASTM Test Method
	US Units	SI Units	US Units	SI Units	
	Psi	MPa	psi	MPa	
Tensile Strength*	83,980	579	70,870	489	D638
Tensile Modulus*	7,017,555	48,351	6,149,730	42,468	D638
Tensile % Elongation *	1.14	1.14	0.98	0.98	D638
140F - Tensile Strength	74,195	511	64,790	447	D638
140F - Tensile Modulus	6,340,680	43,688	6,203,025	43,739	D638
140F - % Elongation	1.12	1.12	0.96	0.96	D638
Compressive Strength	54,245	373	38,570	267	D695
Compressive Modulus	6,707,855	46,218	6,496,100	44,759	D695
90 deg Tensile Strength	83,980	579	70,870	489	D638
90 deg Tensile Modulus	7,017,555	48,351	6,930,773	47,753	D638
90 deg %Tensile Elongation	1.14	1.14	0.98	0.98	D638
Shear Strength +/-45 In Plane	14,630	101	12,920	89	D3518
Shear Modulus +/-45 In Plane	0	0	0	0	D3518
Ply Thickness (inch/mm)	0.04	1			
Tensile Strength per inch width in each direction	2583	17.8	1854	12.7	D3039

* 24 sample coupons per test series; all other values based on 6 coupon test series

¹ Average value of test series - based on year 2000 testing program

² Average value minus 3 standard deviations calculated from the year 2000 testing program

Cured Laminate Properties with Sikadur Hex 306 Epoxy
 Properties after standard cure followed by standard post cure.
 [70°-75°F(21°-24°C) - 5 days and 48 hour post cure at 140°F(60°C)]

Property	Average Value ¹		Design Value ²		ASTM Test Method
	US Units	SI Units	US Units	SI Units	
	Psi	MPa	Psi	MPa	
Tensile Strength*	82,080	565	69,825	481	D638
Tensile Modulus*	6,320,350	43,547	5,198,875	35,821	D638
Tensile % Elongation *	1.19	1.19	0.94	0.94	D638
140F - Tensile Strength	54,435	375	45,315	312	D638
140F - Tensile Modulus	4,704,875	32,417	3,779,765	26,044	D638
140F - % Elongation	1.13	1.13	0.76	0.76	D638
Compressive Strength	46,835	323	36,005	248	D695
Compressive Modulus	5,505,155	37,931	4,693,190	32,336	D695
90 deg Tensile Strength	82,080	565	69,825	481	D638
90 deg Tensile Modulus	6,320,350	43,547	5,198,875	35,821	D638
90 deg %Tensile Elongation	1.19	1.19	0.94	0.94	D638
Shear Strength +/-45 In Plane	12,160	84	11,020	77	D3518
Shear Modulus +/-45 In Plane	416,480	2,870	380,570	2,623	D3518
Ply Thickness (inch/mm)	0.04	1			
Tensile Strength per inch width	3283	14.6	2793	12.4	D3039

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 (ACI 503R) 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 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.

Mixing	Consult Sikadur 300/Hex 300 or Sikadur 301 data sheets for information on epoxy resins.
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 115C can be impregnated using Sikadur 300/Hex 300 or Sikadur 301 epoxy. For best results on larger projects, the impregnation process should be accomplished using a mechanically driven fabric 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 roller prior to placement. In either case, installation of this system should be performed only by a specially trained, approved contractor. For overhead or vertical applications, prime concrete with Sikadur 30 or Sikadur 330 to improve tack. Saturate fabric with Sikadur 300/Hex 300 or Sikadur 301.
Cutting SikaWrap	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. Consult MSDS for proper handling procedures.
Limitations	<ul style="list-style-type: none"> ■ Design calculations must be made and certified by an independent licensed professional engineer. ■ System is a vapor barrier. Concrete should not be encapsulated in areas of freeze/thaw.

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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



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