

PRODUCT DATA SHEET

SikaWrap® Hex-103 C

CARBON FIBER FABRIC FOR STRUCTURAL STRENGTHENING

PRODUCT DESCRIPTION

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

USES

SikaWrap® Hex-103 C may only be used by experienced professionals.

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

Changes in the Structural System

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

Corrections to Design or Construction Defects

- Insufficient reinforcements
- Insufficient structural depth

CHARACTERISTICS / ADVANTAGES

- Used for shear, confinement, seismic or flexural strengthening
- Versatile, can be wrapped around complex geometries
- High Strength
- Light Weight
- Non-corrosive
- Alkali Resistant
- Low aesthetic impact

APPROVALS / STANDARDS

- Independently tested in accordance with ICC AC125 "Acceptance Criteria for Concrete and Reinforced and Unreinforced Masonry Strengthening Using Fiber-reinforced Composite Systems" (refer to current evaluation service report ICC ESR-3288).
- Compliant with 2015, 2012 and 2009 International Building Code (IBC) and International Residential Code (IRC); 1997 Uniform Building Code (UBC).
- Used in systems that follow American Concrete Institute (ACI) 440 Guides for the Design and Construction of Externally Bonded FRP Systems for Strengthening Concrete / Unreinforced Masonry Structures.

PRODUCT INFORMATION

Fiber Type	0° (unidirectional) - Carbon
Packaging	Rolls: 25 in. x 50 ft. (63.5 cm x 15.2 m); 25 in. x 300 ft. (63.5 cm x 91.4 m)
Shelf Life	10 years from date of production if stored properly in original, unopened, undamaged packaging.
Storage Conditions	Store dry at 40°- 95° F (4°- 35° C)
Dry Fibre Thickness	0.0135 in. (0.34 mm)
Area Density	18 oz. / sq. yd. (610 g/m ²)
Dry Fibre Tensile Strength	550 ksi (3,793 MPa)
Dry Fibre Modulus of Elasticity in Tension	34 msi (234.5 GPa)
Dry Fibre Elongation at Break	1.5%

TECHNICAL INFORMATION

Nominal Ply Thickness	0.04 in. (1.0 mm)		
Tensile Strength	Average Ultimate Value	Design Value (f_{fu}^*)	(ASTM D 3039)
	181.0 ksi (1,248 MPa)	160.9 ksi (1,110 MPa)*	at 73° F (23° C), 50% R.H.
	* Average ultimate value minus 3 standard deviations		
	Average Ultimate Value	Design Value	(ASTM D 7565)
	-	6.4 kips/in./ply (1,143 kg/cm/ply)	at 73° F (23° C), 50% R.H.
Tensile Modulus	Average Ultimate Value	Design Value (E_f)	(ASTM D 3039)
	-	10.39 msi (71.7 GPa)	at 73° F (23° C), 50% R.H.
	* Average ultimate value minus 3 standard deviations		
Tensile % Elongation	Average Ultimate Value	Design Value (ϵ_{fu}^*)	(ASTM D 3039)
	1.75%	1.45%*	at 73° F (23° C), 50% R.H.
	* Average ultimate value minus 3 standard deviations		
Tensile Stiffness	Average Ultimate Value	Design Value ($A_f E_f$)	(ASTM D 7565)
	-	416 kips/in. width (74,289 kg/cm width)	at 73° F (23° C), 50% R.H.
	* Average ultimate value minus 3 standard deviations		

APPLICATION INSTRUCTIONS

SUBSTRATE 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 Hex-300 and/or Sikadur-330 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 required is 200 psi (1.4 MPa) with concrete substrate failure (typical).

Preparation Work: Concrete - Blast clean, shotblast or use other approved mechanical means to provide a roughened, open-textured surface (minimum ICRI CSP-3). 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 blasting or water blasting may be sufficient. If a wet method is used, allow for a thorough amount of

drying time.

APPLICATION METHOD / TOOLS

Prior to placing the fabric, the concrete surface is primed and sealed using either Sikadur Hex-300 or Sikadur-330 depending upon orientation. In either case, installation of this system should be performed only by a specially trained contractor.

Tooling & Finishing

Fabric can be cut to appropriate lengths by using a commercial quality, heavy duty scissors. Since dull or worn cutting implements can damage, weaken or fray the fabric, their use should be avoided.

LIMITATIONS

- System is a vapor barrier when cured. Concrete should not be fully encapsulated in areas of freeze/thaw. The ability to permit the release of moisture vapor from the substrate may need to be considered.
- Design calculations must be made and certified by an independent licensed professional engineer.
- Do not place carbon fiber in direct contact with steel. Must be isolated (e.g. with a SikaWrap glass fabric) to protect against corrosion.
- On projects governed by ICC regulations, use products listed on evaluation service report ESR-3288.

BASIS OF PRODUCT 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.

OTHER RESTRICTIONS

See Legal Disclaimer.

ENVIRONMENTAL, HEALTH AND SAFETY

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

LEGAL DISCLAIMER

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

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at usa.sika.com or by calling SIKA's Technical Service Department at 800-933-7452. Nothing contained in any SIKA literature or 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 label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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