

# PRODUCT DATA SHEET

## SikaWrap®-230 C

WOVEN UNIDIRECTIONAL CARBON FIBER FABRIC, DESIGNED FOR STRUCTURAL STRENGTHENING APPLICATIONS AS PART OF THE SIKA® STRENGTHENING SYSTEM.

### DESCRIPTION

SikaWrap®-230 C is a unidirectional woven carbon fiber fabric with mid-range strength, designed for installation using the dry or wet application process.

### USES

SikaWrap®-230 C may only be used by experienced professionals.

Structural strengthening of reinforced concrete, masonry, brickwork and timber elements or structures, to increase flexural and shear loading capacity for:

- Improved seismic performance of masonry walls
- Replacing missing steel reinforcement
- Increasing the strength and ductility of columns
- Increasing the loading capacity of structural elements
- Enabling changes in use / alterations and refurbishment
- Correcting structural design and / or construction defects
- Increasing resistance to seismic movement
- Improving service life and durability
- Structural upgrading to comply with current standards

### CHARACTERISTICS / ADVANTAGES

- Manufactured with heat-set weft fibers to keep the fabric stable
- Multifunctional fabric for use in many different strengthening applications
- Flexible and accommodating to different surface planes and geometry (beams, columns, chimneys, piles, walls, soffits, silos etc.)
- Available in different widths for optimum utilisation
- Low density for minimum additional weight
- Extremely cost effective in comparison to traditional strengthening techniques

### APPROVALS / STANDARDS

- Complies to DPWH Standard Specification for Item 416 - Carbon Fiber Sheet
- Poland: Technical Approval ITB AT-15-5604/2011: Zestaw wyrobów Sika CarboDur do wzmacniania i napraw konstrukcji betonowych
- Poland: Technical Approval IBDiM Nr AT/2008-03-0336/1 „Płaskowniki, pręty, kształtki i maty kompozytowe do wzmacniania betonu o nazwie handlowej: Zestaw materiałów Sika CarboDur® do wzmacniania konstrukcji obiektów mostowych
- France: Avis Technique N° 3/16-875 (annule et remplace N° 3/10-669) Sika® CarboDur®, SikaWrap®

### PRODUCT INFORMATION

<b>Construction</b>	Fibre orientation	0° (longitudinal, unidirectional)	
	Warp	Black carbon fibers 99 %	
	Weft	White thermoplastic heat-set fibres 1 %	
<b>Fibre Type</b>	Selected mid-range strength carbon fibers		
<b>Packaging</b>		<b>Fabric length per roll</b>	<b>Fabric width</b>
	1 rolls in a cardboard box	100 m	500 mm

<b>Shelf Life</b>	Unlimited Shelf life if stored properly	
<b>Storage Conditions</b>	Store in undamaged, original sealed packaging, in dry conditions at temperatures between +5 °C and +35 °C. Protect from direct sunlight.	
<b>Dry Fibre Density</b>	1.82 g/cm <sup>3</sup>	
<b>Dry Fibre Thickness</b>	0.129 mm (based on fiber content)	
<b>Area Density</b>	235 g/m <sup>2</sup> ±10 g/m <sup>2</sup> (carbon fibers only)	
<b>Dry Fibre Tensile Strength</b>	4 000 N/mm <sup>2</sup>	(ISO 10618)
<b>Dry Fibre Modulus of Elasticity in Tension</b>	230 000 N/mm <sup>2</sup>	(ISO 10618)
<b>Dry Fibre Elongation at Break</b>	1.7 %	(ISO 10618)

## TECHNICAL INFORMATION

<b>Laminate Nominal Thickness</b>	0.129 mm	
<b>Laminate Nominal Cross Section</b>	129 mm <sup>2</sup> per m width	
<b>Laminate Tensile Strength</b>	<b>Average</b> 3 500 N/mm <sup>2</sup>	<b>Characteristic</b> 3 200 N/mm <sup>2</sup> (ASTM D 3039*)
<b>Laminate Modulus of Elasticity in Tension</b>	<b>Average</b> 220 kN/mm <sup>2</sup>	<b>Characteristic</b> 210 kN/mm <sup>2</sup> (ASTM D 3039*)
	* modification: sample with 50 mm Values in the longitudinal direction of the fibres Single layer, minimum 27 samples per test series	
<b>Laminate Elongation at Break in Tension</b>	1.59 %	(based on ASTM D 3039)
<b>Tensile Resistance</b>	<b>Average</b> 452 kN/m	<b>Characteristic</b> 413 kN/m (based on ASTM D 3039)
<b>Tensile Stiffness</b>	<b>Average</b> 28.4 MN/m 28.4 kN/m per ‰ elongation	<b>Characteristic</b> 27.1 MN/m 27.1 kN/m per ‰ elongation (based on ASTM D 3039)

## SYSTEM INFORMATION

<b>System Structure</b>	The system build-up and configuration as described must be fully complied with and may not be changed.	
	Concrete substrate adhesive primer	Sikadur®-330
	Impregnating / laminating resin	Sikadur®-330 or Sikadur®-300
	Structural strengthening fabric	SikaWrap®-230 C
	For detailed information on Sikadur®-330, together with the resin and fabric application details, please refer to the Sikadur®-330 Product Data Sheet and the relevant Method Statement.	

## APPLICATION INFORMATION

### Consumption

#### Dry application with Sikadur®-330

First layer including priming layer	0.7–1.2 kg/m <sup>2</sup>
Following layers	0.5 kg/m <sup>2</sup>

#### Wet application with Sikadur®-300, primer Sikadur®-330

Primer layer	1.0–1.3 kg/m <sup>2</sup>
Fabric layers	0.6 kg/m <sup>2</sup>

Please also refer to the relevant Method Statement for further information.

## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY

Minimum substrate pull-off strength: 1.0 N/mm<sup>2</sup> or as specified in the strengthening design. Please also refer to the relevant Method Statement for further information.

### SUBSTRATE PREPARATION

Concrete must be cleaned and prepared to achieve a laitance and contaminant free, open textured surface. Please also refer to the relevant Method Statement for further information.

### APPLICATION METHOD / TOOLS

The fabric can be cut with special scissors or a Stanley knife (razor knife / box-cutter knife). Never fold the fabric. SikaWrap®-230 C is applied using the dry or wet application process. Please refer to the relevant Method Statement for details on the impregnating / laminating procedure.

## FURTHER DOCUMENTS

### Method Statements

Ref. 850 41 02: SikaWrap® manual dry application  
Ref. 850 41 03: SikaWrap® manual wet application  
Ref. 850 41 04: SikaWrap® machine wet application

## LIMITATIONS

- SikaWrap®-230 C shall only be applied by trained and experienced professionals.
- A specialist structural engineer must be consulted for any structural strengthening design calculation.
- SikaWrap®-230 C fabric is coated to ensure maximum bond and durability with the Sikadur® adhesives / impregnating / laminating resins. To maintain and ensure full system compatibility, do not exchange system components.
- SikaWrap®-230 C can be over coated with a cementitious overlay or other coatings for aesthetic and / or protective purposes. The over coating system selection is dependent on the exposure and the project specific requirements. For additional UV light protection in exposed areas use Sikagard®-550 W Elastic, Sikagard® ElastoColor-675 W or Sikagard®-680 S.
- Please refer to the relevant Method Statement of

SikaWrap® for further information, guidelines and limitations.

## BASIS OF PRODUCT DATA

All technical data stated in this Product Data Sheet are based on laboratory tests. Actual measured data may vary due to circumstances beyond our control.

## LOCAL RESTRICTIONS

Please note that as a result of specific local regulations the performance of this product may vary from country to country. Please consult the local Product Data Sheet for the exact description of the application fields.

## ECOLOGY, HEALTH AND SAFETY

For information and advice on the safe handling, storage, and disposal of chemical products, users shall refer to the most recent Safety Data Sheet (SDS) containing physical, ecological, toxicological and other safety-related data

## LEGAL NOTES

The information, and, in particular, the recommendations relating to the application and end-use of Sika products, are given in good faith based on Sika's current knowledge and experience of the products when properly stored, handled and applied under normal conditions in accordance with Sika's recommendations. In practice, the differences in materials, substrates and actual site conditions are such that no warranty in respect of merchantability or of fitness for a particular purpose, nor any liability arising out of any legal relationship whatsoever, can be inferred either from this information, or from any written recommendations, or from any other advice offered. The user of the product must test the product's suitability for the intended application and purpose. Sika reserves the right to change the properties of its products. The proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users must always refer to the most recent issue of the local Product Data Sheet for the product concerned, copies of which will be supplied on request.

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