

PRODUCT DATA SHEET

SikaWrap®-451 C IN

Woven unidirectional carbon fibre fabric, designed for structural strengthening applications as part of the Sika® strengthening system

DESCRIPTION

SikaWrap®-451 C IN is a unidirectional woven carbon fibre fabric made with high strength carbon fibres, designed for installation using the dry application process.

USES

SikaWrap®-451 C IN may only be used by experienced professionals.

Structural strengthening of reinforced concrete, masonry, brickwork and timber elements or structures, to increase axial, 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 fibres 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.)
- Low density for minimal additional weight
- Extremely cost effective in comparison to traditional strengthening techniques

PRODUCT INFORMATION

Chemical base	Carbon fibre	
Construction	Fibre orientation	0° (unidirectional)
	Warp	Black carbon fibres 95 %
	Weft	Heat-set glass fibres 5 %
Fibre type	Selected high strength carbon fibres	

Packaging		Fabric length per roll	Fabric width
	1 roll in cardboard box	≥ 50 m	500 mm
Shelf life	24 months from date of production		
Storage conditions	Store in undamaged, original sealed packaging, in dry conditions at temperatures between +5 °C and +35 °C. Protect from direct sunlight.		
Appearance / Colour	Black fabric		
Dry fibre density	1.80 g/cm ³		
Dry fibre thickness	0.250 mm (based on fibre content)		
Area density	450 g/m ² ± 23 g/m ² (carbon fibres only)		

TECHNICAL INFORMATION

Dry fibre tensile strength	4 900 N/mm ²	(ISO 10618)
Dry fibre modulus of elasticity in tension	250 000 N/mm ²	(ISO 10618)
Dry fibre elongation at break	2.1 %	(ISO 10618)
Laminate nominal thickness	0.250 mm	
Laminate nominal cross section	250 mm ² per m width	

SYSTEM INFORMATION

System structure	The system build-up and configuration as described must be fully complied with and may not be changed.	
	Concrete substrate adhesive primer	Sikadur®-330 IN
	Impregnating / laminating resin	Sikadur®-330 IN
	Structural strengthening fabric	SikaWrap®-451 C IN
For detailed information on Sikadur®-330 IN, together with the resin and fabric application details, please refer to the Product Data Sheet of Sikadur®-330 IN and to the relevant Method Statement.		

APPLICATION INFORMATION

Consumption	Dry application with Sikadur®-330 IN as primer and adhesive layer:	
	First layer fabric including primer and lamination	0.8–1.2 kg/m ²
	Following fabric layers	0.5–0.8 kg/m ²
Note: Consumption is for standard application only. Rough or uneven substrate surfaces, fabrics crossings, loss and wastage can lead to a higher resin consumption.		
Please also refer to the relevant Method Statement for further information.		

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.

FURTHER DOCUMENTS

Method Statements

Ref. 850 41 02: SikaWrap® manual dry application

IMPORTANT CONSIDERATIONS

- SikaWrap®-451 C IN shall only be applied by trained and experienced professionals.
- A specialist structural engineer must be consulted for any structural strengthening design calculation.
- SikaWrap®-451 C IN 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 interchange different system components.
- SikaWrap®-451 C IN 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 protection against UV light in exposed areas use Sikagard®-550 W IN, Sikagard®-680 MY or Sikagard® PU UR.
- Please refer to the Method Statement of SikaWrap® manual dry application (Ref. 850 41 02) for further information, guidelines and limitations.

ECOLOGY, HEALTH AND SAFETY

User must read the most recent corresponding Safety Data Sheets (SDS) before using any products. The SDS provides information and advice on the safe handling, storage and disposal of chemical products and contains physical, ecological, toxicological and other safety-related data.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Minimum substrate tensile strength: 1.0 N/mm² 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®-451 C IN is applied using the dry application process.

Please refer to the relevant Method Statement for details on the impregnating / laminating procedure.

LOCAL RESTRICTIONS

Note that as a result of specific local regulations the declared data and recommended uses for this product may vary from country to country. Consult the local Product Data Sheet for exact product data and uses.

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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