BUILDING TRUST

PRODUCT DATA SHEET

Sika® CarboDur® S NSM

PULTRUDED CARBON FIBRE PLATES FOR STRUCTURAL STRENGTHENING AS PART OF THE SIKA® CARBODUR® SYSTEM

DESCRIPTION

Sika® CarboDur® plates are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber and masonry
Sika® CarboDur® plates are bonded into slots as near surface mounted reinforcement using Sika AnchorFix®-3+, Sikadur®-330 or Sikadur®-30 epoxy resin based adhesives for normal application temperatures, or Sikadur®-30 LP epoxy resin based adhesive for elevated temperatures during application. Sikadur®-300 epoxy resin based adhesive is used for horizontal applications.
Please refer to the relevant Product Data Sheet for more detailed information about each of these adhesives.
Suitable for use in hot and tropical climatic conditions.

USES

Sika® CarboDur® S NSM may only be used by experienced professionals.
Sika® CarboDur® systems are used to improve, increase or repair the performance and resistance of structures for:

Increased Load Carrying Capacity:
- Increasing the load capacity of floor slabs, beams and bridge sections
- For the installation of heavier machinery
- To stabilise vibrating structures
- For changes in building use

Damage to structural elements due to:
- Deterioration of the original construction materials
- Steel reinforcement corrosion
- Accidents (Vehicle impact, earthquakes, fire)

Improvement of serviceability and durability:
- Reduced deflection and crack width
- Stress reduction in the steel reinforcement
- Improved fatigue resistance

Change of the structural system:
- Removal of walls and / or columns
- Removal of floor and wall sections to create access / openings

Resistance to possible events:
- Increased resistance to earthquakes, impact or explosion etc.

To repair design or construction defects such as:
- Insufficient / inadequate reinforcement
- Insufficient / inadequate structural depth

CHARACTERISTICS / ADVANTAGES

- Non-corroding
- Very high strength
- Excellent durability and fatigue resistance
- Unlimited lengths, no joints required
- Easy transportation (rolls)
- Lightweight, very easy to install
- Minimum preparation of plate
- Smooth edges without exposed fibres as result of production by pultrusion
- Extensive Testing and Approvals available from many countries worldwide

APPROVALS / CERTIFICATES

- Slovakia: TSUS, Building Testing and research institutes.
- Slovakia: Technical Approval TO - 09 / 0080, 2009: Systémy dodatočného zosilňovania konštrukcií Sika® CarboDur® a SikaWrap®.
- 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.
- UK: Concrete Society Technical Report No. 55, Design guidance for strengthening concrete structures using fibre composite material, 2012.
- Italy: CNR - DT 200 R1 / 2013 - Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Existing Structures.

PRODUCT INFORMATION

Packaging	Supplied in rolls of 250 m in nonreturnable cardboard boxes.
Appearance / Colour	Carbon fibre reinforced polymer with an epoxy matrix, black.
Shelf life	Unlimited, provided the storage conditions are met.
Storage conditions	Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures of maximum +50 °C. Protect from direct sunlight. Transportation: only in the original packaging, or otherwise adequately protected against any mechanical damage
Density	1.60 g/cm³
Dimensions	

Type Sika® CarboDur® S NSM	Width	Thickness	Cross section area
1.030	10 mm	3.0 mm	30 mm²
1.525	15 mm	2.5 mm	37.5 mm²
2.025	20 mm	2.5 mm	50 mm²

Select dimensions according to local Sika product range.

Fibre Volume Content	> 68 %

TECHNICAL INFORMATION

Laminate Tensile Strength	Mean value	3 100 N/mm²	(EN 2561)
	5 % Fractile-value	2 900 N/mm²	
	Values in the longitudinal direction of the fibres		
Laminate Modulus of Elasticity in Tension	Mean value	170 000 N/mm²	(EN 2561)
	5 % Fractile-value	165 000 N/mm²	
	Values in the longitudinal direction of the fibres		
Laminate Elongation at Break in Tension	Mean value	1.80 %	(EN 2561)
	Values in the longitudinal direction of the fibres		
Glass Transition Temperature	> 100 °C		(EN 61006)

SYSTEMS

System Structure

The system build-up and configuration as described must be fully complied with and may not be changed.
Resin Adhesive – Sika AnchorFix®-3+, Sikadur®-330, Sikadur®-30, Sikadur®-30 LP
Structural strengthening Carbon plates – Sika® CarboDur® S NSM
For detailed information on the different resins, together with the application details, please refer to the latest Product Data Sheets and the "Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement".

APPLICATION INFORMATION

Consumption

All CarboDur® plates	≤ 0.12 kg/m*

*Note: Consumption is for standard application only. Loss and wastage can lead to a higher adhesive consumption.

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Recommended minimum concrete pull-off strength after surface preparation: 1.0 N/mm²
Please refer to the "Method Statement for Sika® CarboDur® Near Surface Mounted Reinforcement" for more detailed information.

SUBSTRATE PREPARATION

Slits must be dry and free from dust and loose particles.
Please also refer to the "Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement" for more detailed information.

APPLICATION METHOD / TOOLS

Please refer to the relevant Product Data Sheet
- Sikadur®-30
- Sikadur®-30 LP
- Sikadur®-330
- Sikadur®-300
- Sika® AnchorFix®-3+

Please refer the "Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement".

IMPORTANT CONSIDERATIONS

Please refer to the relevant Sika® epoxy adhesive Product Data Sheet:
- Sikadur®-30
- Sikadur®-30 LP
- Sikadur®-330
- Sikadur®-300
- Sika® AnchorFix®-3+

A suitably qualified Structural Engineer must be responsible for the design of the strengthening works. Additionally as this application is structural, great care must also be taken in selecting suitably experienced and trained specialist contractors.
Maximum permissible continuous service temperature is approximately +50 °C.
Please also refer to the "Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement".
Contact Sika Technical Department for detailed advice.

BASIS OF PRODUCT DATA

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

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 the exact product data and uses.

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.

REGULATION (EC) NO 1907/2006 - REACH

This product is an article as defined in article 3 of regulation (EC) No 1907/2006 (REACH). It contains no substances which are intended to be released from the article under normal or reasonably foreseeable conditions of use. A safety data sheet following article 31 of the same regulation is not needed to bring the product to the market, to transport or to use it. For safe use follow the instructions given in the product data sheet. Based on our current knowledge, this product does not contain SVHC (substances of very high concern) as listed in Annex XIV of the REACH regulation or on the candidate list published by the European Chemicals Agency in concentrations above 0,1 % (w/w)

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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