

PRODUCT DATA SHEET

Sika® CarboDur® S NSM

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

PRODUCT 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.

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 / STANDARDS

- 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 max. +50 °C. Protect from direct sunlight. Transportation: only in the original packaging, or otherwise adequately protected against any mechanical damage			
Density	1.60 g/cm ³			
Dimensions	Type Sika® CarboDur® S NSM	Width	Thickness	Cross section area
	1.030	10 mm	3.0 mm	30 mm ²
	1.525	15 mm	2.5 mm	37.5 mm ²
	2.025	20 mm	2.5 mm	50 mm ²
Fibre Volume Content	> 68 %			

TECHNICAL INFORMATION

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

SYSTEM INFORMATION

System Structure	The system build-up and configuration as described must be fully complied with and may not be changed. Resin Adhesive – Sikadur®-33, Sikadur®-330, Sikadur®-30, Structural strengthening Carbon plates – Sika® CarboDur® S NSM For detailed information on the different resins, together with the application details, refer to the latest Product Data Sheets and the “Technical Information Manual for Sika® CarboDur® Near Surface Mounted Reinforcement” Ref: 850 41 07.
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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

Refer to the "Technical Information Manual for Sika® CarboDur® Near Surface Mounted Reinforcement"
Ref: 850 41 07 for more detailed information.

SUBSTRATE PREPARATION

Slits must be dry and free from dust and loose particles.

Refer to the "Technical Information Manual for Sika® CarboDur® Near Surface Mounted Reinforcement"
Ref: 850 41 07 for more detailed information.

APPLICATION METHOD / TOOLS

Refer to the relevant Product Data Sheet

- Sikadur®-30
- Sikadur®-33
- Sikadur®-330

Refer to the "Technical Information Manual for Sika® CarboDur® Near Surface Mounted Reinforcement" Ref: 850 41 07.

LIMITATIONS

refer to the relevant Sika® epoxy adhesive Product Data Sheet:

- Sikadur®-30
- Sikadur®-33
- Sikadur®-330

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 approx. +50 °C.

Refer to the "Technical Information Manual for Sika® CarboDur® Near Surface Mounted Reinforcement"
Ref: 850 41 07.

Contact Sika technical service for detailed advice.

VALUE BASE

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

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 this 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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