

PRODUCT DATA SHEET

Sika® CarboDur® LAM CFS

(formerly MBrace LAM CFS)

Pultruded carbon fibre plates for structural strengthening as part of the Sika® CarboDur® LAM system

DESCRIPTION

Sika® CarboDur® LAM CFS plates are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber, masonry, steel and fibre reinforced polymer structures.

Sika® CarboDur® LAM CFS plates are bonded onto the structure as externally bonded reinforcement using Sikadur® 30 LP IN epoxy resin based adhesive. Refer to the relevant Product Data Sheet for more detailed information about the adhesive.

USES

Sika® CarboDur® LAM CFS may only be used by experienced professionals.

Sika® CarboDur® LAM CFS is used as a reinforcement plate for externally bonded structural strengthening systems on concrete, masonry, wood, steel and reinforced polymer substrates.

Externally bonded structural strengthening systems are used for:

- Enhancing the load-carrying capacity or ductility of structural members
- Increasing the flexural loading capacity of elements and structures
- Improving fatigue resistance
- Reducing the stress on steel reinforcement
- Structural upgrading of weak concrete elements or structures
- Replacing missing steel reinforcement
- Changing the structural system (removal of floor or wall sections)
- Repairing structural elements after damage (vehicle impact, fire, earthquake)
- Improving impact resistance
- Passive strengthening for seismic event protection

Please note:

- The Product may only be used by experienced professionals.
- A specialist structural engineer must be consulted for any structural strengthening design calculation.

CHARACTERISTICS / ADVANTAGES

- Very cost effective in comparison to traditional strengthening techniques
- Fast application increases productivity, saves time and reduces disruption
- Improves the service life of a structure
- Resistant to corrosion
- Very high strength
- Excellent durability and fatigue resistance
- Easy transport as a roll
- Low system thickness, simple execution of plate intersections and crossings
- Low density for minimal additional weight
- Lightweight, very easy to install, especially overhead (without temporary support)
- Smooth edges without exposed fibres as a result of production by pultrusion
- Extensive testing and approvals available from many countries worldwide

PRODUCT INFORMATION

Packaging	Roll length	25m and 100m		
Shelf life	5 years from date of production			
Storage conditions	The Product must be stored in original, unopened and undamaged sealed packaging in dry conditions at temperatures between +5 °C and +35 °C. Protect the Product from direct sunlight. Always refer to the packaging.			
Density	1.60 g/cm³			
Dimensions	Product-type	Width	Thickness	Cross section area
	50/1.4	50 mm	1.4 mm	70 mm²
	100/1.4	100 mm	1.4 mm	140 mm²
	100/2.4	100 mm	2.4 mm	240 mm²
	100/3.0	100 mm	3.0 mm	300 mm²

TECHNICAL INFORMATION

Laminate tensile strength	Mean	3000 N/mm ²	(ASTM D 3039)
	Minimum	2800 N/mm ²	
Laminate modulus of elasticity in tension	Mean	165 kN/mm ²	(ASTM D 3039)
Laminate elongation at break in tension	Mean	1.5 %	(ASTM D 3039)
Laminate nominal thickness	1.4–3.0 mm		

APPLICATION INFORMATION

Consumption	Plate width	Typical adhesive consumption
	50 mm	0.20–0.28 kg/m
	100 mm	0.44–0.64 kg/m
Rough or uneven substrate surfaces, plate crossings, loss and wastage can lead to a higher adhesive consumption of up to 20%.		

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

Reference must be made to the following Sika® Method Statement:

- Sika Method Statement 850 41 19 Sika® CarboDur® LAM System

Reference must be made to the following Product Data Sheets:

- Sikadur® 30 LP IN epoxy adhesive

ECOLOGY, HEALTH AND SAFETY

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 condi-

tions 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).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

SIKA® CARBODUR® PLATES EXTERNALLY BONDED TO THE CONCRETE SURFACE

Recommended minimum concrete pull-off strength after surface preparation:

- Mean: 2.0 N/mm²
- Minimum: 1.5 N/mm²

The effective concrete pull-off strength after surface

preparation has to be verified. If concrete pull-off strength is below the stated minimum requirements, alternative Sika solutions are available:

- Sika® CarboDur® LAM applied in slots as near surface mounted (NSM) reinforcement
- SikaWrap® fabrics: Please refer to the Product Data Sheet for the SikaWrap® fabrics

Concrete must generally be older than 28 days (dependent on curing conditions and the type of concrete).

SIKA® CARBODUR® EXTERNALLY BONDED TO OTHER SUBSTRATES

For the application of Sika® CarboDur® plates to all other substrates (brick, stone, steel, wood, fibre reinforced polymer) please refer to Ref: Sika Method Statement 850 41 19 Sika® CarboDur® LAM System. Contact Sika Technical Service for detailed advice.

SUBSTRATE PREPARATION

Clean and prepare the concrete to achieve a laitance-free, contaminant-free, open-textured surface.

The application must take place on a dry support, which has a humidity not exceeding 6 % and with a relative environmental humidity not exceeding 85 %. Refer to Sika Method Statement 850 41 19 Sika® CarboDur® LAM System for further information.

APPLICATION

IMPORTANT

Application by trained personnel

The application of this Product must only be carried out by an applicator that is trained or approved by Sika. The applicator must also be experienced in this type of application.

IMPORTANT

Strictly follow installation procedures

Strictly follow installation procedures as defined in Method Statements, application manuals and working instructions which must always be adjusted to the actual site conditions.

IMPORTANT

Exposure to UV or weathering

The Product is not resistant to permanent UV exposure or weathering.

1. Contact Sika Technical Services for detailed advice.

Maximum service temperature

Note: Maximum permissible continuous service temperature is approximately +45 °C. Refer to Sika Method Statement 850 41 19 Sika® CarboDur® LAM System and contact Sika Technical Service for detailed advice. Please refer to the relevant Product Data Sheets and method statement:

- The Product Data Sheet for Sikadur® 30 LP IN

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.

Sika India Pvt. Ltd.

620, Diamond Harbour Road
Commercial Complex II
Kolkata - 700 034
West Bengal, India

Contact:

Phone: +91 33 2447 2448
Fax: +91 33 2397 8688
info.india@in.sika.com
www.sika.in



Product Data Sheet

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