

## PRODUCT DATA SHEET

# Sika® CarboDur® M

Pultruded carbon fibre plates with high stiffness for structural strengthening as part of the Sika® CarboDur® system

### DESCRIPTION

Sika® CarboDur® M plates are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber, masonry, steel and fibre reinforced polymer structures. The plates are bonded onto the structure as externally bonded reinforcement using Sikadur®-30 epoxy resin based adhesive for normal temperatures, or Sikadur®-30 LP epoxy resin based adhesive for elevated temperatures during application or service. Please refer to the relevant Product Data Sheet for more detailed information about each of these adhesives.

### USES

Sika® CarboDur® M may only be used by experienced professionals.

Sika® CarboDur® M 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
- Stabilising vibrating structures
- Replacing missing steel reinforcement
- Structural upgrading of weak concrete elements or structures
- Improving impact resistance
- Passive strengthening for seismic event protection
- Changing the structural system (removal of floor or wall sections)
- Improving fatigue resistance
- Reducing the stress on steel reinforcement
- Repairing structural elements after damage (vehicle impact, fire, earthquake)

Please note:

- A specialist structural engineer must be consulted for any structural strengthening design calculation.

### FEATURES

- Very high strength and high stiffness
- Non-corroding
- Excellent durability and fatigue resistance
- Up to 250 m long, no joints required
- Low system thickness, simple execution of plate intersections and crossings
- Easy transport as a roll
- Lightweight, very easy to install, especially overhead (without temporary support)
- Minimum preparation of plate
- Applicable in multiple layers
- Smooth edges without exposed fibres as a result of production by pultrusion
- Extensive testing and approvals available from many countries worldwide

### CERTIFICATES AND TEST REPORTS

- Czech Republic: Technical Approval, ITC, Nr. STO-AO 224-1012/2020/a
- Technical Approval, CSTB, Avis Technique 3.3/20-1021\_V1
- Certificate of Technical Valuation, CSLPP, No. 259/2023
- National Technical Assessment Sika CarboDur® kit, ITB, Approval No. ITB-KOT-2018/0414 v.2
- Technical Approval Sika CarboDur, Nr. IBDiM-KOT-2019-0361 v.2
- Technical Agreement, CTPC, No. 016-01/488-2022
- Test report, University of Belgrade, No. 459/2019
- Slovakia: Technical Assessment, TSUS, No. SK04-ZSV-2669
- Test Report, Ministry of Regional Development (Ukraine), No. 3HT-219-2167.13-001

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August 2024, Version 10.01

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## PRODUCT INFORMATION

Fibre volume content	> 68 %																												
Packaging	Cut to size as follows in non-returnable cardboard packaging. Supplied in rolls of 250 m in non-returnable cardboard boxes. Refer to the current price list for available packaging variations.																												
Shelf life	5 years from date of production																												
Storage conditions	Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures of max. +50 °C. Protect from direct sunlight. Transport only in the original packaging, or otherwise adequately protected against any mechanical damage																												
Appearance and colour	Carbon fibre-reinforced polymer with an epoxy matrix, black																												
Dimensions	<table><thead><tr><th>Sika® CarboDur® M</th><th>Width</th><th>Thickness</th><th>Cross section area</th></tr></thead><tbody><tr><td>514</td><td>50 mm</td><td>1.4 mm</td><td>70 mm<sup>2</sup></td></tr><tr><td>614</td><td>60 mm</td><td>1.4 mm</td><td>84 mm<sup>2</sup></td></tr><tr><td>814</td><td>80 mm</td><td>1.4 mm</td><td>112 mm<sup>2</sup></td></tr><tr><td>914</td><td>90 mm</td><td>1.4 mm</td><td>126 mm<sup>2</sup></td></tr><tr><td>1014</td><td>100 mm</td><td>1.4 mm</td><td>140 mm<sup>2</sup></td></tr><tr><td>1214</td><td>120 mm</td><td>1.4 mm</td><td>168 mm<sup>2</sup></td></tr></tbody></table>	Sika® CarboDur® M	Width	Thickness	Cross section area	514	50 mm	1.4 mm	70 mm <sup>2</sup>	614	60 mm	1.4 mm	84 mm <sup>2</sup>	814	80 mm	1.4 mm	112 mm <sup>2</sup>	914	90 mm	1.4 mm	126 mm <sup>2</sup>	1014	100 mm	1.4 mm	140 mm <sup>2</sup>	1214	120 mm	1.4 mm	168 mm <sup>2</sup>
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Density	1.60 g/cm <sup>3</sup>																												

## TECHNICAL INFORMATION

Laminate tensile strength	Mean	3500 N/mm <sup>2</sup>	(EN 2561)
	5 % characteristic	3200 N/mm <sup>2</sup>	
	Mean	3500 N/mm <sup>2</sup>	(ASTM D3039)
	Characteristic (ACI 440.2R)	3200 N/mm <sup>2</sup>	
Laminate modulus of elasticity in tension	Mean	210 kN/mm <sup>2</sup>	(EN 2561)
	5 % characteristic	205 kN/mm <sup>2</sup>	
	Mean	210 kN/mm <sup>2</sup>	(ASTM D3039)
Laminate elongation at break in tension	Mean	1.70 %	(EN 2561)
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®-30 or Sikadur®-30 LP	
	Structural strengthening carbon plates	Sika® CarboDur® M	
	For detailed information on Sikadur®-30 or Sikadur®-30 LP, together with the resin and plate application details, please refer to the individual Product Data Sheets and Ref: 850 41 05 Method Statement Sika® CarboDur® System.		

## APPLICATION INFORMATION

Consumption	Width of Sika® CarboDur® M plate	Typical consumption of Sikadur®-30
	50 mm	0.20–0.28 kg/m
	60 mm	0.24–0.32 kg/m
	90 mm	0.40–0.56 kg/m
	100 mm	0.44–0.64 kg/m
	120 mm	0.45–0.80 kg/m

### Consumption rate

Note: Consumption is for standard application only. 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 DOCUMENTATION

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

- 850 41 05 Method Statement Sika® CarboDur® System

Reference must be made to the following Product Data Sheets:

- Sikadur®-30
- Sikadur®-30 LP

## 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 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)

## 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/mm<sup>2</sup>
- Minimum: 1.5 N/mm<sup>2</sup>

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® 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: 850 41 05 Method Statement Sika® CarboDur® 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. Refer to Ref: 850 41 05 Method Statement Sika® CarboDur® 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.

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### Maximum service temperature

Note: Maximum permissible continuous service temperature is approximately +50 °C. When using the Sika® CarboHeater 2 for curing Sikadur®-30 LP the maximum continuous service temperature can be increased to +80 °C. Refer to 850 41 05 Method Statement Sika® CarboDur® 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
- The Product Data Sheet for Sikadur®-30 LP
- 850 41 05 Method Statement Sika® CarboDur® System

## LOCAL RESTRICTIONS

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

## LEGAL NOTES

Any information or suggestions for use concerning Sika's products, which we either in writing or orally have given buyers or end-users of the product, have been given in good faith based on our own experiences and based on approved praxis and the technological and scientific knowledge on the time of giving such suggestions and information, which are given without any type of guarantees, and which do not lead to any further responsibility from Sika Danmark A/S, besides what is stated in the sales agreement in question. The buyer or end-user should themselves investigate or otherwise make sure, that our products are suitable for the use in question and further make sure that the products are kept and used correct and in agreement with the published rules and considering the actual conditions in order to avoid damages or less satisfactory results. Any order is accepted and any deliverance is affected according to the general terms of sales and delivery from Sika Danmark A/S, which are considered known and accepted, and which could be handed out when asked for. Our catalogues are not up-dated automatically. The present product data sheet is only for use in Denmark. Values stated in the present product data sheet should be seen as recommended, unless stated otherwise.