

## PRODUCT DATA SHEET

# Sika® CarboShear L

L-Shaped carbon fibre shear links profiles for structural strengthening. Part of the Sika® CarboDur® System

### DESCRIPTION

Sika® CarboShear L carbon fibre shear links are corrosion resistant, designed for strengthening concrete structures in shear and to anchor Sika® CarboDur® plates at their ends. They are part of the Sika® CarboDur® CFRP Strengthening System. Sika® CarboShear L shear links are bonded as external reinforcement using Sikadur®-30 od Sikadur®-30 LP epoxy resin based adhesive.

### USES

Sika® CarboShear L may only be used by experienced professionals.

Sika® CarboShear L profiles are used as a reinforcement profiles for externally bonded shear structural strengthening systems on concrete for:

- Increasing the shear load capacity of beams.
- Reducing the stress on steel reinforcement
- Changes in building use.
- Deterioration of the original construction materials
- Steel reinforcement corrosion
- Improved fatigue resistance
- Replacing missing steel reinforcement
- Passive seismic retrofitting strengthening for to prevent brittle shear failure mechanism
- Insufficient / inadequate reinforcement

Please note:

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

### CHARACTERISTICS / ADVANTAGES

- Tested anchorage system.
- Non-corroding
- Very high strength and durability
- Shear and bursting enhancement.
- Well defined anchoring.
- Lightweight.
- Low overall thickness, can be over coated.
- Easy transportation.
- Easy installation – no heavy handling and installation equipment.
- Outstanding fatigue resistance.
- Minimal preparation of the shear links is required.
- Minimal aesthetic impact.

### APPROVALS / STANDARDS

- Czech Republic: Technical Approval, ITC, Nr. STO-AO-1012/2020/a
- Technical Agreement, CTPC, No. 016-01/488-2022
- Slovakia: Technical Assessment, TSUS, No. SK04-ZSV-2669
- 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
- EMPA Test Report 169'219 E/1: Testing of CFRP shear strips on reinforced concrete T-beams T1 and T2, Swiss Federal Laboratories for Materials Testing and Research EMPA, 1998
- EMPA Test Report 169'219 E/2: Testing of CFRP shear strips. Flexural beam T3, Swiss Federal Laboratories for Materials Testing and Research EMPA, 1998
- EMPA Test Report 116/7: Shear strengthening with prefabricated CFRP L-shaped plates, Test beams S1 to S6, Swiss Federal Laboratories for Materials Testing and Research EMPA, 2002

## PRODUCT INFORMATION

Fibre Volume Content	> 55 %																									
Packaging	Packs of 20 links, or individual pieces																									
Shelf Life	4 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. Transportation: only in the original packaging, or otherwise adequately protected against any mechanical damage																									
Appearance / Colour	Carbon fibre reinforced polymer with an epoxy matrix, black.																									
Dimensions	Sika® CarboShear L is a CFRP L-shaped plate with a 90° bend. <table><thead><tr><th>Type</th><th>Leg length short</th><th>Leg length long</th><th>Width</th><th>Nominal thickness</th></tr></thead><tbody><tr><td>4/20/50</td><td>200 mm</td><td>500 mm</td><td>40 mm</td><td>2 mm</td></tr><tr><td>4/30/70</td><td>300 mm</td><td>700 mm</td><td>40 mm</td><td>2 mm</td></tr><tr><td>4/50/100</td><td>500 mm</td><td>1000 mm</td><td>40 mm</td><td>2 mm</td></tr><tr><td>4/80/150</td><td>800 mm</td><td>1500 mm</td><td>40 mm</td><td>2 mm</td></tr></tbody></table> <p>The leg length can be cut to size (by saw, or preferably by diamond cutting disk). The inner radius of the bend zone is 25 mm for all sizes</p>	Type	Leg length short	Leg length long	Width	Nominal thickness	4/20/50	200 mm	500 mm	40 mm	2 mm	4/30/70	300 mm	700 mm	40 mm	2 mm	4/50/100	500 mm	1000 mm	40 mm	2 mm	4/80/150	800 mm	1500 mm	40 mm	2 mm
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Density	1.55 g/cm <sup>3</sup>																									

## TECHNICAL INFORMATION

Laminate Tensile Strength	Mean* 5 % characteristic*	1850 N/mm <sup>2</sup> 1700 N/mm <sup>2</sup>	(EN 2561)
*Values in the longitudinal direction of the fibres, considering a nominal thickness of 2 mm			
Laminate Modulus of Elasticity in Tension	Mean*	95 000 N/mm <sup>2</sup>	(EN 2561)
*Values in the longitudinal direction of the fibres, considering a nominal thickness of 2 mm			
Laminate Elongation at Break in Tension	Mean*	1.60 %	(EN 2561)
*Values in the longitudinal direction of the fibres, considering a nominal thickness of 2 mm			
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. <table><tr><td>Resin adhesive</td><td>Sikadur®-30 or Sikadur®-30 LP</td></tr><tr><td>Structural strengthening carbon plates</td><td>Sika® CarboShear L</td></tr></table> <p>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 Sika® CarboShear Externally Bonded Shear Reinforcement" Ref: 850 41 06.</p>	Resin adhesive	Sikadur®-30 or Sikadur®-30 LP	Structural strengthening carbon plates	Sika® CarboShear L
Resin adhesive	Sikadur®-30 or Sikadur®-30 LP				
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## APPLICATION INFORMATION

Consumption	Please refer to the "Method Statement Sika® CarboShear Externally Bonded Shear Reinforcement" Ref: 850 41 06.
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## 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.

## LIMITATIONS

**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.** Sika® CarboShear strengthening systems with Sika® CarboShear L profiles must be protected from permanent exposure to direct sunlight, moisture and/or water. Please refer to the relevant Method Statement and Product Data Sheets for the selection of suitable over coating materials in situations where systems will be fully or partially exposed. Contact Sika technical service for detailed advice.

## 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)

### REGULATION (EC) NO 1907/2006 - REACH

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## APPLICATION INSTRUCTIONS

### SUBSTRATE QUALITY

SIKA® CARBOSHEAR PROFILES 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.

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

### SUBSTRATE PREPARATION

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

Please refer to the "Method Statement Sika® CarboShear Externally Bonded Shear Reinforcement" Ref: 850 41 06.

### 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 +50 °C. refer to the "Method Statement Sika® CarboShear Externally Bonded Shear Reinforcement" Ref: 850 41 06.

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

## 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.

## 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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