BUILDING TRUST

PRODUCT DATA SHEET

Sika® CarboDur® E

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

PRODUCT DESCRIPTION

Sika® CarboDur® E plates are pultruded carbon fibre reinforced polymer (CFRP) laminates, designed for strengthening concrete, timber, masonry, steel and fibre reinforced polymer structures.
Sika® CarboDur® E plates are bonded onto the structure as externally bonded reinforcement using Sikadur®-30 epoxy resin based adhesive.Refer to the relevant Product Data Sheet for more detailed adhesive information.

USES

Sika® CarboDur® E installation works to be carried out only by Sika Approved Contractors. Please observe information given by Product Data Sheets.

Sika® CarboDur® E 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
- Unlimited lengths, no joints required
- Low system thickness, simple execution of plate intersections or crossings
- Easy transportation (rolls)
- Lightweight, very easy to install, especially overhead (without temporary support)
- Minimum preparation of plate, applicable in several layers
- Smooth edges without exposed fibres as result of production by pultrusion
- Testing and Approvals available

PRODUCT INFORMATION

Fibre Volume Content	> 70 %
Packaging	Supplied in rolls of 25 and 100 m
Shelf Life	Unlimited
Storage Conditions	No exposure to direct sunlight (UV light), in dry conditions and at temperatures of max. 50 °C

Appearance / Colour	Carbon fibre reinforced polymer with a vinyl ester matrix, black

Dimensions

Type	Width	Thickness	Cross section area
Sika® CarboDur® E 514	50 mm	1.4 mm	70 mm²
Sika® CarboDur® E1014	100 mm	1.4 mm	140 mm²
Sika® CarboDur® E1214	120 mm	1.4 mm	168 mm²

TECHNICAL INFORMATION

Laminate Tensile Strength (ASTM D3039)

Mean	Characteristic*
2200 N/mm²	2000 N/mm²

Values in longitudinal direction of fibres
* 5 % fractile

Laminate Tensile Modulus of Elasticity (ASTM D3039)

Mean	Characteristic*
180 kN/mm²	170 kN/mm²

Value in longitudinal direction of fibres
* 5 % fractile

Laminate Elongation at Break (ASTM D3039)

Mean	Characteristic*
1.22 %	1.18 %

Value in longitudinal direction of fibres
* 5% fractile

Reaction to Fire

Where required for local regulations, Sika® CarboDur® E plates can also be over coated with additional fire protection materials

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
CFRP plate	Sika® CarboDur® E

For detailed information on Sikadur®-30 refer to the Sikadur®-30 Product Data Sheet and the “Technical Information Manual CarboDur® Externally Bonded Reinforcement"

APPLICATION INFORMATION

Consumption

Width of CarboDur® plate	Typical Consumption of Sikadur®-30
50 mm	0.25–0.35 kg/m
80 mm	0.40–0.55 kg/m
100 mm	0.55–0.80 kg/m
120 mm	0.65–1.00 kg/m

VALUE BASE

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

FURTHER DOCUMENTS

Technical Information Manual
Sika® CarboDur® Externally Bonded Reinforcement, Ref: 850 41 05

LIMITATIONS

- A specialist structural engineer must be consulted for any structural strengthening design calculation.
- Additionally, as this application is structural, great care must also be taken in selecting suitably experienced and trained specialist contractors.
- Sika® CarboDur® E strengthening systems with Sika® CarboDur® E plates must be protected from permanent exposure to direct sunlight, moisture and/or water.Refer to the relevant Technical Information

Manuals and Product Data Sheets for the selection of suitable overcoating materials, in situations where systems will be fully or partially exposed.
- Maximum permissible continuous service temperature is approx. +50 °C.
- Refer to the relevant Technical Information Manuals for further limitations and guidelines
- Contact Sika technical service for detailed advice.

ECOLOGY, HEALTH AND SAFETY

REGULATION (EC) NO 1907/2006 - REACH

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).

APPLICATION INSTRUCTIONS

SUBSTRATE QUALITY

Sika® CarboDur® E 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 the concrete pull-off strength is below the stated minimum requirements, alternative Sika solutions are available:
- 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 etc.)

Sika® CarboDur® E externally bonded to other substrates
For application of CarboDur® plates to all other substrates (brick, stone, steel, wood, fibre reinforced polymer etc.) refer to the Technical Information Manual or contact Sika technical service for detailed advice.

SUBSTRATE PREPARATION

Concrete must be cleaned and prepared to achieve a laitance and contaminant free, open textured surface. Refer to the Technical Information Manual for further information.

APPLICATION METHOD / TOOLS

Refer to the relevant Product Data Sheet of Sikadur®-30 and to the Technical Information Manual.

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.

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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