

# BUILDING PRODUCT INFORMATION SHEET

## Sika® CarboDur® BC

### Pultruded carbon fibre rods for structural strengthening as part of the Sika® CarboDur® system

#### DESCRIPTION

Sika® CarboDur® BC rods are pultruded carbon fibre reinforced polymer (CFRP) laminates with a circular cross section, designed for strengthening concrete, timber and masonry. Sika® CarboDur® BC rods 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. Sika® CarboDur® BC rods can also be used for anchoring SikaWrap® fabrics where positive attachment to concrete or masonry is required. Please refer to the relevant Product Data Sheet for more detailed information about each of the adhesives.

#### USES

Sika® CarboDur® BC rods 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

##### *Combination with other strengthening products:*

- Doweling applications
- Anchoring of SikaWrap® fabrics

#### LIMITATIONS OF USE

All structural design work including the specification of Sika CarboDur products and their location within the structure shall only be undertaken by a registered Professional Structural Engineer. All aspects of the installation work must be undertaken by one of Sika's approved contractors.

#### FEATURES

- Non-corroding
- Very high strength
- Invisible once installed, no joints required
- Excellent durability and fatigue resistance
- Easy transportation
- Lightweight, very easy to install
- Smooth edges without exposed fibres as the result of production by pultrusion
- Can accept traffic on the strengthened surface (rods not exposed)
- No surface preparation / levelling of uneven substrates required

- Improved resistance to fire (compared with externally bonded reinforcement)
- Testing and Approvals available from many countries worldwide

## APPROVALS / CERTIFICATES

- Poland: Technical Approval IBDiM Nr AT/2008-03-0336/1 „Płaskownicy. pręty, kształtki i maty kompozytowe do wzmacniania betonu o nazwie handlowej: Zestaw materiałów Sika® CarboDur® do wzmacniania konstrukcji obiektów mostowych
- Fib, Technical Report, bulletin 14: Externally bonded FRP reinforcement for RC structures, July 2001
- Italy: CNR-DT 200/2004 - Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Existing Structures

## PRODUCT INFORMATION

<b>Product identifier</b>	Sika® CarboDur® BC		
<b>Place of manufacture</b>	Overseas		
<b>Fibre volume content</b>	> 65 %		
<b>Packaging</b>	Supplied in rolls of 100 m (BC 6) in non-returnable cardboard boxes, or cut to 12 m long bars (BC 8, BC 10, BC 12).		
<b>Shelf life</b>	Unlimited, provided the storage conditions are met.		
<b>Storage conditions</b>	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		
<b>Appearance and colour</b>	Carbon fibre reinforced polymer with an epoxy matrix, black.		
<b>Dimensions</b>	Type	Diameter	Cross sectional area
	Sika® CarboDur® BC6	6 mm	28 mm <sup>2</sup>
	Sika® CarboDur® BC8	8 mm	50 mm <sup>2</sup>
	Sika® CarboDur® BC10	10 mm	79 mm <sup>2</sup>
	Sika® CarboDur® BC12	12 mm	113 mm <sup>2</sup>
<b>Density</b>	1.60 g/cm <sup>3</sup>		

## TECHNICAL INFORMATION

<b>Laminate tensile strength</b>	Mean value	3,100 N/mm <sup>2</sup>	(EN 2561)
	5% Fractile value	2,900 N/mm <sup>2</sup>	
	Values in the longitudinal direction of the fibres		
<b>Laminate modulus of elasticity in tension</b>	Mean value	148,000 N/mm <sup>2</sup>	(EN 2561)
	Values in the longitudinal direction of the fibres		
<b>Laminate elongation at break in tension</b>	Minimum value	> 1.70 %	(EN 2561)
	Values in the longitudinal direction of the fibres		
<b>Glass transition temperature</b>	> 100 °C	(EN 61006)	

## SYSTEM INFORMATION

<b>System structure</b>	The system build-up and configuration as described must be fully complied with and may not be changed. Resin Adhesive – Sika AnchorFix®-3+, Sikadur®-330, Sikadur®-30, Sikadur®-30 LP Structural strengthening Carbon plates – Sika® CarboDur® BC For detailed information on the different resins, together with the application details, please refer to the latest Product Data Sheets and the “Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement” Ref: 850 41 07
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## APPLICATION INFORMATION

<b>Consumption</b>	Sika® CarboDur® BC6	≤ 0.12 kg/m
	Sika® CarboDur® BC8	≤ 0.18 kg/m
	Sika® CarboDur® BC10	≤ 0.24 kg/m
	Sika® CarboDur® BC12	≤ 0.32 kg/m

## MANUFACTURER AND IMPORTER INFORMATION

<b>Manufacturer information</b>	Address	Sika Supply Centre AG Industriestrasse 26 6060, Sarnen Switzerland
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<b>Importer information</b>	Address	Sika (NZ) Limited 85-91 Patiki Road Avondale, Auckland 1026 New Zealand
	Phone number	0800 745 269
	Website	<a href="https://nzl.sika.com/">https://nzl.sika.com/</a>
	Email address	info@nz.sika.com
	NZBN	9429000018791

## BUILDING CODE INFORMATION

<b>Building Code clauses</b>	B1 Structure: Performance clauses B1.3.1, B1.3.2, B1.3.3(a, b, f) B1.3.4. B2 Durability: Performance clause B2.3.1-(a) not less than 50 years F2 Hazardous Building Materials: Performance clause F2.3.1
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<b>Building Code compliance statements</b>	<p>Performance B1.3.1, B1.3.2, B1.3.3(a, b, f), B1.3.4: When the Sika CarboDur system is designed and specified by a registered Professional Structural Engineer; and it is used as an externally applied strengthening system it contributes to the concrete (or other substrates as stated in the product data sheets) meeting the loading requirements, as defined in the preceding B1 Structure performance clauses. Refer to the product data sheets and <a href="http://nzl.sika.com">nzl.sika.com</a> For a list of certificates and approvals that support the use of CarboDur for external Strengthening.</p> <p>Performance B2.3.1 (a) 50 years: The Sika CarboDur system will achieve the 50 year requirement for durability. Refer to the product data sheets and <a href="http://nzl.sika.com">nzl.sika.com</a> For a list of certificates and approvals that support the use of CarboDur for external Strengthening. The Sika CarboDur system has been in use continuously in NZ since 1995</p> <p>Performance F2.3.1: This product meets this requirement when used and applied in accordance with Sika's installation instructions and does not present a health hazard to people occupying or using the building. Refer to the Sika Product Technical Data sheet and product Safety Data Sheet <a href="http://nzl.sika.com">nzl.sika.com</a> for further information if required</p>
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## BASIS OF PRODUCT DATA

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

- Sikadur®-330
- Sikadur®-300
- Sikadur®-33
- Sika AnchorFix®-3+

## IMPORTANT CONSIDERATIONS

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

- Sikadur®-30
- Sikadur®-30 LP

**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. Please also refer to the "Method Statement Sika® CarboDur®"

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Near Surface Mounted Reinforcement” Ref: 850 41 07 for further limitations and guidelines. 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).

## APPLICATION INSTRUCTIONS

### INSTALLATION REQUIREMENTS

The specified Sika CarboDur system must be installed by a trained and approved specialist Sika applicator

### DESIGN REQUIREMENTS

All structural design work including the specification of Sika CarboDur products and their location within the structure shall only be undertaken by a registered Professional Structural Engineer

Design and specification of products for the required Sika CarboDur system will need to consider protection of the installed system. Refer to the Sika product data sheets and the method statements at [nzl.sika.com](http://nzl.sika.com) for further information

### SUBSTRATE PREPARATION

Please refer to the “Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement” Ref: 850 41 07

### APPLICATION

Please refer to the relevant Product Data Sheet

- Sikadur®-30
- Sikadur®-30 LP
- Sikadur®-330
- Sikadur®-300

- Sikadur®-33
- Sika AnchorFix®-3+

Please refer to the “Method Statement Sika® CarboDur® Near Surface Mounted Reinforcement” Ref: 850 41 07

## MAINTENANCE REQUIREMENTS

In applications where the installed Sika CarboDur system is not located and protected behind permanently fixed, UV blocking, building materials, such as wallboard linings, etc. there will need to be an annual maintenance check to ensure that the system and any protective over coatings have not been damaged, or are deteriorating. This inspection and any necessary remedial work, shall be undertaken by Sika's approved applicator.

## 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. It may be necessary to adapt the above disclaimer to specific local laws and regulations. Any changes to this disclaimer may only be implemented with permission of Sika® Corporate Legal in Baar.

The building product/building product line is not subject to warning or ban under section 26 of the Building Act 2004.

### Sika (NZ) Limited

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