



**PRODUCT DATA SHEET**

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COMPOSITE REINFORCING

# Sika® CarboDur® Rods

## CARBON FIBER RODS FOR STRUCTURAL STRENGTHENING

<b>Description</b>	Sika® CarboDur® Rods are pultruded carbon fiber reinforced polymer (CFRP) rods designed for strengthening concrete, timber and masonry structures. The rods are primarily installed using the Near Surface Mounted (NSM) technique by inserting into grooves cut into the substrate and bonded with an epoxy resin. The rods can also be used for anchoring SikaWrap® fabrics for positive attachment to concrete or masonry.
<b>Where to Use</b>	<ul style="list-style-type: none"> <li>▪ Negative moment reinforcing in slabs and decks.</li> <li>▪ Anchoring of SikaWrap® fabrics.</li> <li>▪ Strengthening of masonry walls.</li> <li>▪ Doweling applications.</li> <li>▪ Cathodic protection applications.</li> </ul> <p><b>Load increases</b></p> <ul style="list-style-type: none"> <li>▪ Increased live loads in warehouses.</li> <li>▪ Increased loading in parking decks.</li> <li>▪ Installation of heavy machinery.</li> <li>▪ Vibrating structures.</li> <li>▪ Changes of building use.</li> </ul> <p><b>Damage to structural parts</b></p> <ul style="list-style-type: none"> <li>▪ Aging of construction materials.</li> <li>▪ Steel reinforcement corrosion.</li> <li>▪ Vehicle impact.</li> <li>▪ Fire.</li> </ul> <p><b>Serviceability improvements</b></p> <ul style="list-style-type: none"> <li>▪ Decrease in deformation.</li> <li>▪ Stress reduction in steel reinforcement.</li> <li>▪ Crack width reduction.</li> </ul> <p><b>Change in structural system</b></p> <ul style="list-style-type: none"> <li>▪ Removal of walls or columns.</li> <li>▪ Removal of slab sections for openings.</li> </ul> <p><b>Design or construction defects</b></p> <ul style="list-style-type: none"> <li>▪ Insufficient reinforcements.</li> <li>▪ Insufficient structural depth.</li> </ul>
<b>Advantages</b>	<ul style="list-style-type: none"> <li>▪ Very high strength.</li> <li>▪ Lightweight.</li> <li>▪ Non-corrosive.</li> <li>▪ Very easy to handle.</li> <li>▪ High modulus of elasticity.</li> <li>▪ Can accept traffic on surface (rods are countersunk).</li> <li>▪ High bond strength due to full encapsulation.</li> <li>▪ Rods are not visible once installed.</li> <li>▪ Outstanding fatigue resistance.</li> <li>▪ Alkali resistant.</li> </ul>
<b>Technical Data</b>	
<b>Packaging</b>	Diameter: 9.52 mm (3/8 in) : 6 m (20 ft) in length
<b>Colour</b>	Black
<b>Shelf Life</b>	Unlimited (no exposure to direct sunlight).
<b>Base</b>	Carbon fiber reinforced polymer with an epoxy resin matrix.

**Properties at 23 °C (73 °F) and 50 % R.H.**

<b>Tensile Strength</b>	2800 MPa (4.06 x 10 <sup>5</sup> psi)	
<b>Tensile Modulus of Elasticity</b>	155 000 MPa (22.5 x 10 <sup>6</sup> psi)	
<b>Strain (Elongation at Break)</b>	1.8 %	
<b>Fiber Volumetric Content</b>	65 %	
<b>Temperature Resistance</b>	> 150 °C (> 300 °F)	

**Physical Properties**

<b>Diameter Cross</b>	<b>Sectional Area</b>	<b>Tensile Strength</b>
6.35 mm (1/4 in)	31.67 mm <sup>2</sup> (0.05 sq in)	55.6 kN (12 500 lb <sub>f</sub> )
9.52 mm (3/8 in)	71.25 mm <sup>2</sup> (0.11 sq in)	122.3 kN (27 500 lb <sub>f</sub> )

**Coverage**

<b>Rod (Diameter)</b>	<b>Groove (Dimensions)</b>	<b>Product</b>	<b>Coverage [m (ft)/unit]</b>
ø = 9.52 mm (3/8 in)	16 mm x 16 mm (5/8 in x 5/8 in)	Sikadur®-32 Hi-Mod	54.1 m (177 ft)/10 L
		Sika AnchorFix®-3001	3.2 m (10 ft)/cartridge
		Sikadur®-330	20 m (65 ft)/5 kg
		Sikadur®-30	19.7 m (64 ft)/6 kg

*Product properties are typically averages, obtained under laboratory conditions. Reasonable variations can be expected on-site due to local factors, including environment, preparation, application, curing and test methods.*

**HOW TO USE****Surface****Preparation**

For Near Surface Mounted Applications, cut a groove into the concrete or masonry surface using an appropriate concrete saw or diamond blade. Surface must be clean and sound. It may be dry or damp, but free of standing water and frost. Remove dust, laitance, grease, curing compounds, impregnations, waxes, foreign particles, disintegrated materials and other bond inhibiting materials from the surface. In addition, brush and clean the groove with compressed air or a vacuum prior to installation of the structural adhesive.

**Preparation Work**

**Concrete:** When using Sikadur®-30, blast clean, shotblast or use other approved mechanical means to provide an open roughened texture.

**Sika® CarboDur® Rods:** wipe clean with appropriate cleaner (e.g. Acetone).

**Cutting the CarboDur Rods**

Rods may be cut to an appropriate length with a diamond blade on a chop saw or grinder. The rods should be wrapped with duct tape in the cutting zone to minimize splintering.

**Mixing**

Consult Sikadur®-30, Sikadur®-330, Sikadur®-32 Hi-Mod or Sika AnchorFix®-3001 Product Data Sheet for information on epoxy resin.

**Application****Near Surface Mounted Application**

Grooves should be cut into the surface of the substrate to receive the Sika® CarboDur® Rods. Care must be taken not to cut through existing reinforcing steel, steel tendons, embedded ducts, or other materials within the substrate. After preparing and cleaning the surface (see above), apply the mixed Sikadur®-30, Sikadur®-32 Hi-Mod or Sika AnchorFix®-2001/3001 into the grooves approximately half-full. Sikadur®-30 and Sikadur®-330, have a paste consistency and may be used for vertical and overhead applications. Sikadur®-32 Hi-Mod has a honey-type consistency and may be used for horizontal applications. Sika AnchorFix®-2001/3001 is packaged in cartridges and can be injected directly into the grooves for horizontal, vertical, or overhead applications. Within the open time of the epoxy, depending on the temperature, press the Sika® CarboDur® Rods into the epoxy in the grooves. Apply additional epoxy over the rods to fill in the grooves. Strike the surface with a trowel to force out any air and provide a clean installation.

**Limitations**

Design calculations must be made and certified by an independent licensed professional engineer.

**Health and Safety Information**

For information and advice on the safe handling, storage and disposal of chemical products, users should refer to the most recent SAFETY DATA SHEET containing physical, ecological, toxicological and other safety-related data.

**KEEP OUT OF REACH OF CHILDREN  
FOR INDUSTRIAL USE ONLY**

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, within their shelflife. 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 other advice offered. The information contained herein does not relieve the user of the products from testing them for the intended application and purpose. 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 or may be downloaded from our website at: [www.sika.ca](http://www.sika.ca)

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