

## PRODUCT DATA SHEET

# Sika® CarboDur® Rods

### Carbon fiber rods for structural strengthening

#### PRODUCT DESCRIPTION

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.

#### USES

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

- Negative moment reinforcing in slabs and decks
- Anchoring of SikaWrap fabrics
- Strengthening of masonry walls
- Doweling applications
- Cathodic protection applications

#### Load increases

- Increased live loads in warehouses
- Increased loading in parking decks
- Installation of heavy machinery
- Vibrating structures
- Changes of building utilization

#### Damage to structural parts

- Aging of construction materials
- Steel reinforcement corrosion
- Vehicle impact
- Fire

#### Serviceability improvements

- Decrease in deformation

- Stress reduction in steel reinforcement
- Crack width reduction

#### Change in structural system

- Removal of walls or columns.
- Removal of slab sections for openings

#### Design or construction defects

- Insufficient reinforcements
- Insufficient structural depth

#### CHARACTERISTICS / ADVANTAGES

- Very high strength
- Lightweight
- Non-corrosive
- Very easy to handle
- High modulus of elasticity
- Can accept traffic on surface (rods are countersunk)
- High bond strength due to full encapsulation
- Rods are not visible once installed
- Outstanding fatigue resistance
- Alkali resistant

## PRODUCT INFORMATION

Packaging	Custom cut lengths available												
Appearance / Color	Black												
Shelf Life	Unlimited (no exposure to direct sunlight)												
Storage Conditions	Store in original, unopened, sealed and undamaged packaging in dry conditions at temperatures of max. 122 °F (+50 °C). Protect from direct sunlight. Transportation: only in the original packaging, or otherwise adequately protected against any mechanical damage												
Dimensions	<table><thead><tr><th>Diameter</th><th>Cross Sectional Area</th><th>Tensile Strength</th></tr></thead><tbody><tr><td>1/4 in.</td><td>0.05 sq. in.</td><td>0.20 sq. in</td></tr><tr><td>3/8 in.</td><td>0.11 sq. in.</td><td>27,500 lbs.</td></tr><tr><td>1/2 in.</td><td>0.20 sq. in</td><td>50,000 lbs</td></tr></tbody></table>	Diameter	Cross Sectional Area	Tensile Strength	1/4 in.	0.05 sq. in.	0.20 sq. in	3/8 in.	0.11 sq. in.	27,500 lbs.	1/2 in.	0.20 sq. in	50,000 lbs
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Fiber Volume Content	65 %												

## TECHNICAL INFORMATION

Tensile Strength	4.06 x 10 <sup>5</sup> psi (2,800 MPa)
Tensile Modulus	22.5 x 10 <sup>6</sup> psi (155,000 MPa)
Tensile % Elongation	1.8 %
Thermal Resistance	>300 °F (>150 °C)

## APPLICATION INFORMATION

Coverage	Coverage of Sikadur 30 or Sikadur 32, Hi-Mod epoxy resin with Sika CarboDur Rods: 1/4 in. diameter approx. 85 LF/gal. (1/2 x 1/2 in. slots); 3/8 in. diameter: approx. 60 LF/gal. (5/8 x 5/8 in. slots); 1/2 in. diameter: approx. 35 LF/gal. (3/4 x 3/4 in. slots)
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## APPLICATION INSTRUCTIONS

### SUBSTRATE 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, clean the groove with compressed air prior to installation.

### Preparation Work

**Concrete** - 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. MEK).

### Cutting the 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 or Sikadur 32, Hi-Mod technical data sheet for information on epoxy resin.

### APPLICATION METHOD / TOOLS

#### 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 Sikadur® AnchorFix into the grooves approximately half-full. Sikadur® 30 has a paste consistency and may be use for vertical and overhead applications. Sikadur® 32, Hi-Mod has a honey-type consistency and may be used for horizontal applications.

Sikadur® AnchorFix 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.

### Anchoring SikaWrap Fabrics

To provide additional anchorage for SikaWrap® Fabrics in shear or flexural strengthening applications, the fabric may be positively attached into grooves in the concrete at the ends. Cut grooves into the concrete as described above. Fill the grooves with either Sikadur® 30, Sikadur® 32 or Sikadur® AnchorFix, depending on the orientation. Place the saturated fabric over the grooves, and press the Sika® CarboDur® Rods into the grooves for positive attachment. Fill in any voids on the surface with additional epoxy, forcing out any air voids that might be present.

## LIMITATIONS

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

## BASIS OF PRODUCT DATA

Results may differ based upon statistical variations depending upon mixing methods and equipment, temperature, application methods, test methods, actual site conditions and curing conditions.

## OTHER RESTRICTIONS

See Legal Disclaimer.

## ENVIRONMENTAL, HEALTH AND SAFETY

For further information and advice regarding transportation, handling, storage and disposal of chemical products, user should refer to the actual Safety Data Sheets containing physical, environmental, toxicological and other safety related data. User must read the current actual Safety Data Sheets before using any products. In case of an emergency, call CHEMTREC at 1-800-424-9300, International 703-527-3887.

## LEGAL DISCLAIMER

- KEEP CONTAINER TIGHTLY CLOSED
- KEEP OUT OF REACH OF CHILDREN
- NOT FOR INTERNAL CONSUMPTION
- FOR INDUSTRIAL USE ONLY
- FOR PROFESSIONAL USE ONLY

Prior to each use of any product of Sika Corporation, its subsidiaries or affiliates ("SIKA"), the user must always read and follow the warnings and instructions on the product's most current product label, Product Data Sheet and Safety Data Sheet which are available at [usa.sika.com](http://usa.sika.com) or by calling SIKA's Technical Service Department at 1-800-933-7452. Nothing contained in any SIKA literature or materials relieves the user of the obligation to read and follow the warnings and instructions for each SIKA product as set forth in the current product label, Product Data Sheet and Safety Data Sheet prior to use of the SIKA product.

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