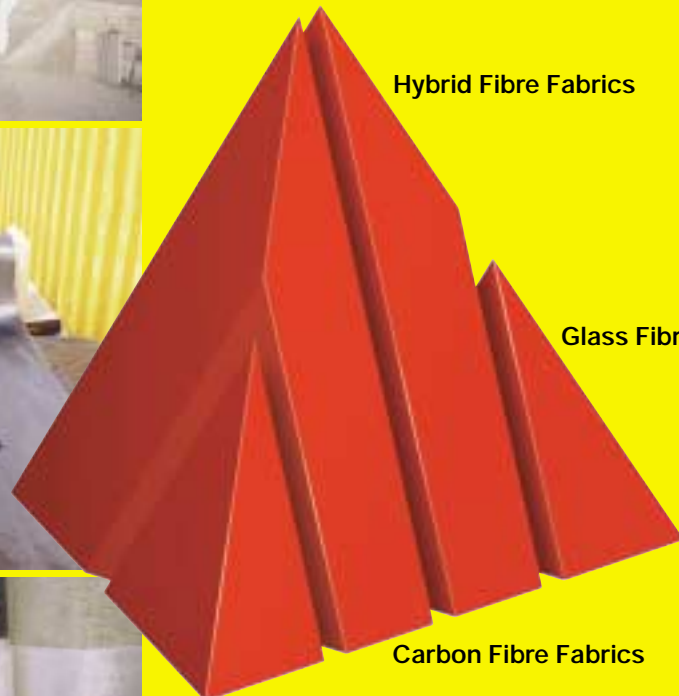


# SikaWrap®

## Composite Structural and Seismic Strengthening Systems



Hybrid Fibre Fabrics

Glass Fibre Fabrics

Carbon Fibre Fabrics

Structural Epoxy Resins

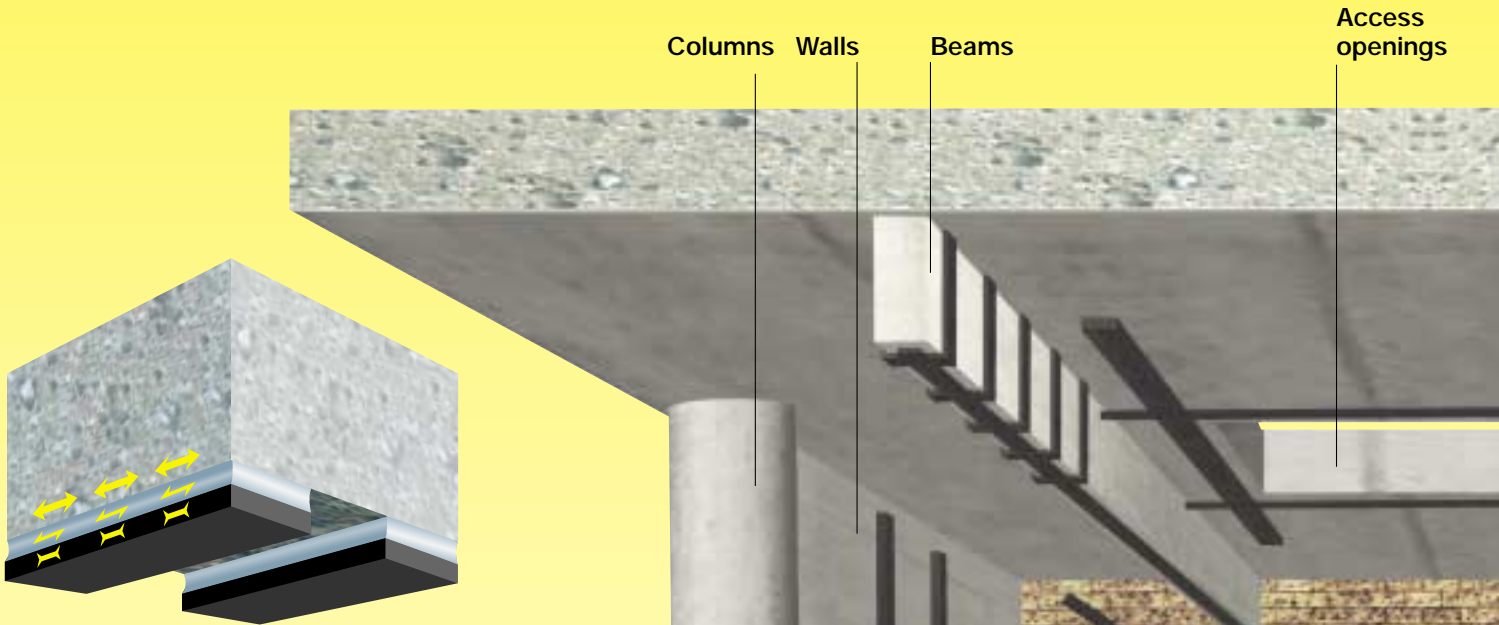
Sika® CarboDur® Composite Strengthening Systems  
A global alliance between Sika and Hexcel.



# Structural Strengthening with Sika® Car

## Sika® CarboDur® Composite Systems

Sika® CarboDur® Composites are high strength materials bonded with structural epoxy resins and adhesives for strengthening purposes. They are available both as factory pultruded plates – Sika® CarboDur® plates – which are bonded on site with Sikadur structural epoxy adhesives, and also as woven fabrics – SikaWrap® fabrics – which are laminated and bonded on site using Sikadur® structural epoxy resins.



## Sika® CarboDur® Plates and Sikadur® Adhesives

### Advantages

- ▲ Accurately defined performance properties
- ▲ Range of dimensions for optimum design
- ▲ Choice of modulus
- ▲ Factory prepared for use
- ▲ Low temperature application with heated plates
- ▲ Elevated "in service" temperature grade
- ▲ Can be post-tensioned
- ▲ Very high strength



Strengthening of reinforced concrete slab with the Sika® CarboDur® Plate System.



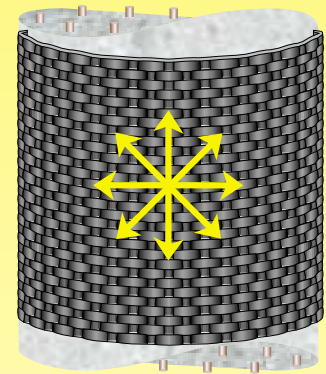


## Strengthening System Requirements

- ▲ Structural Requirements
- ▲ Static loading
- ▲ Dynamic Loading
- ▲ Stiffening
- ▲ Creep resistance
- ▲ Durability
- ▲ Environmental Exposure Requirements
- ▲ Temperature
- ▲ Moisture
- ▲ Frost
- ▲ Freeze/thaw
- ▲ Corrosion
- ▲ Ultra violet radiation

Masonry walls

Decks



## SikaWrap® Fabrics and Sikadur® Adhesives

Advantages

- ▲ Shear strengthening
- ▲ Impact and blast resistance
- ▲ Easily accommodates details
- ▲ Simple application on circular and square members
- ▲ High strength
- ▲ Carbon fibre, glass and hybrid fabrics available



Application of SikaWrap® Fabric System for impact resistance on a bridge column.

# SikaWrap® Application Procedures



SikaWrap® systems can be applied by two different processes according to the client and the site requirements. These are known as the “wet” and “dry” processes respectively:

▲ In the “wet” process the SikaWrap® fabric is impregnated with Sikadur® epoxy resin in a saturator machine and applied “wet” to the sealed substrate.

▲ In the “dry” process the dry SikaWrap® fabric is applied directly into the Sikadur® resin which has been saturated uniformly onto the concrete surface.

▲ Following the Sika “wet” or the Sika “dry” process can achieve equal performance on site.

## “Wet” Fabric Application Process

## “Dry” Fabric Application Process



Sealing the concrete with Sikadur® epoxy resin.  
Seals the concrete and promotes adhesion.



Sealing and saturating the concrete with Sikadur® epoxy resin.  
Seals the concrete and promotes adhesion.



Impregnation of fabric using saturator machine.  
Controls resin distribution and increases productivity on large-scale projects.



“Dry” fabric is applied directly onto the resin saturated concrete surface.  
Quick installation on small-scale projects.



“Wet” fabric is applied onto the sealed concrete surface.  
Flexible to accommodate the shape of any structure.



The fabric is rolled with a laminating roller.  
Air voids eliminated and fabric saturated.



The Sikadur® or Sikagard® topcoat applied over the fabric.  
Sika’s wide range of coatings can be applied for protective or aesthetic purposes.



The Sikadur® or Sikagard® topcoat applied over the fabric.  
Sika’s wide range of coatings can be applied for protective or aesthetic purposes.

# Selection of the Appropriate Sika® CarboDur® Composite System

## System Selection Chart for Reinforced Concrete

Application Field	CarboDur® Plates	SikaWrap® Hex Carbon Systems	SikaWrap® Hex Glass Systems
<b>Beam Strengthening</b>			
Flexure	✓ ✓	✓	✓
Shear	✓ ✓	✓ ✓ ✓	✓
Serviceability	✓ ✓	✓	
<b>Slab Strengthening</b>			
Flexure	✓ ✓	✓	✓
Shear		✓ ✓ ✓	✓
Serviceability	✓ ✓	✓	
<b>Column Strengthening</b>			
Flexure	✓	✓ ✓	✓
Shear	✓	✓ ✓ ✓	✓
Impact		✓	✓ ✓ ✓
Seismic		✓	✓ ✓ ✓
Serviceability	✓	✓ ✓	
<b>Wall Strengthening</b>			
Flexure	✓ ✓	✓	✓
Shear		✓ ✓ ✓	✓
Impact		✓	✓ ✓ ✓
Seismic	✓	✓	✓ ✓ ✓
Blast	✓	✓ ✓ ✓	✓ ✓ ✓
Serviceability	✓ ✓	✓	

✓ acceptable method    ✓ ✓ best method

Sikadur® epoxy resin based structural resins and adhesives proven in segmental bridge construction and structural strengthening worldwide since 1960.

Sikadur® epoxy resin systems also have outstanding mechanical and chemical properties which have been repeatedly proven in extensive testing programs throughout the world.

Specific test data giving the precisely defined adhesive performance and properties include:

- ▲ Water absorption
- ▲ Modulus of elasticity
- ▲ Shear strength
- ▲ Creep resistance
- ▲ Corrosion resistance
- ▲ Glass transition temperature
- ▲ Compressive strength
- ▲ Tensile strength
- ▲ Bond strength
- ▲ Durability
- ▲ Squeezeability and sag resistance
- ▲ "Wetting" ability
- ▲ Minimal shrinkage
- ▲ Solvent free



Segmental bridge construction with Sikadur® epoxy resin adhesive.



External steel plate structural strengthening with Sikadur® epoxy resin adhesive.

Sikadur® defined resin and adhesive performance.



# SikaWrap® Composite Systems for Structures

## Strengthening Applications with SikaWrap

### All Types of Structure

- ▲ Buildings
- ▲ Bridges
- ▲ Tunnels
- ▲ Tanks
- ▲ Parking
- ▲ Marine
- ▲ Industrial
- ▲ Water
- ▲ Power

### All Types of Strengthening

- ▲ Flexural
- ▲ Shear
- ▲ Impact
- ▲ Blast
- ▲ Seismic
- ▲ Stiffening
- ▲ Deflection
- ▲ Fatigue
- ▲ Restraint

### All Types of Substrate

- ▲ Concrete
- ▲ Cast and Wrought Iron
- ▲ Steel
- ▲ Masonry
- ▲ Timber

### Column Strengthening



Impact strengthening of a bridge.



Strengthening for stiffness in a car park.



Restraint at the top of a bridge column.

## All Elements of the Structure

### Beam Strengthening



Shear strengthening of a beam in a building.



Shear and Flexural strengthening of a beam in a car park.



Shear strengthening of a bridge beam.

### Slab Strengthening



Surface preparation and sealing cracks prior to the shear strengthening of a slab in a building.



Shear strengthening of a slab in a car park.



Shear strengthening of a bridge deck slab

Also Available from Sika®

## Sika® Technology Series



## Sika® Quality and Durability Sika® Information Series



## Sika® FerroGard® Series



## Sika® Strengthening Series



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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 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 proprietary rights of third parties must be observed. All orders are accepted subject to our current terms of sale and delivery. Users should always refer to the most recent issue of the Technical Data Sheet for the product concerned, copies of which will be supplied on request.

For more information on Sika visit [www.barbourproductsearch.info](http://www.barbourproductsearch.info)