BUILDING TRUST
CONSTRUIRE LA CONFIANCE

PRODUCT DATA SHEET
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COMPOSITE REINFORCING

SikaWrap®-1400 C

HIGH-STRENGTH, CARBON FIBRE FABRIC FOR STRUCTURAL STRENGTHENING

Description

SikaWrap®-1400 C is a high-strength, high-modulus, unidirectional carbon fibre fabric. Material is field laminated using Sikadur®-300 epoxy to form a carbon fibre reinforced polymer (CFRP) used to strengthen structural elements.

Where to Use

Load increases
- Increasing the live loads in warehouses.
- Increased traffic volumes on bridges.
- Installation of heavy machinery in industrial buildings.
- Vibrating structures.
- Changes of building utilization.

Seismic strengthening
- Column wrapping.
- Masonry walls.

Damage to structural parts
- Aging of construction materials.
- Vehicle impact.
- Fire.
- Blast Resistance.

Change in structural system
- Removal of walls or columns.
- Removal of slab sections for openings.

Design or construction defects
- Insufficient reinforcement.
- Insufficient structural depth.

Advantages
- Used for shear, confinement or flexural strengthening.
- Flexible, can be wrapped around complex shapes.
- High Strength.
- Light Weight.
- Non-corrosive.
- Alkali Resistant.
- Low Aesthetic Impact.

Technical Data

Packaging	610 mm x 41,2 m roll (24 in x 45 yd)
Colour	Black
Shelf Life	10 years
Storage Conditions	Store dry between 4 - 35 °C (40 - 95 °F)

Fibre Properties

Primary fibre direction	0° (unidirectional)
Tensile strength	4240 MPa (615 x 10^3 psi)
Tensile modulus	242 GPa (35,1 x 10^6 psi)
Elongation	1.75 %
Density	1.77 g/cm^3 (0.064 lb/in^3)
Area weight	1385 g/m^2 (40.5 oz/sq. yd)

Cured Laminate Properties with Sikadur®-300

	Average value		Design value		ASTM Test
Property	MPa	(psi)	MPa	(psi)	**Method**
Tensile strength*	1800	(261 065)	1355	(196 525)	D3039/ D7565
Tensile modulus			115 700	(16.78 x 10^6)	D3039/ D7565
Tensile % elongation*	1.25		0.95		D3039/ D7565
Nominal laminate thickness	1,3 mm	(0,051 po)			

*Average ultimate value minus 3 standard deviations.

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

Prepare the concrete surface by sandblasting or grinding (CSP 3 - 4 as per ICRI). Remove any dust or loose particles by means of an industrial vacuum cleaner. The surface must be clean, free from grease and oil and should be dry with the maximum substrate moisture content of < 4 % by weight.
The surface to be bonded must be level, with no irregularities or protrusion > 0.5 mm (20 mils). Larger deviations must be levelled with Sikadur®-30, extended with (mix. ratio 1:1 parts by volume) oven-dried silica sand for thicknesses over 3 mm (1/8 in).
The concrete adhesive strength must be verified following surface preparation by random pull-off testing (ACI 503R) at the engineer's discretion. Minimum tensile strength, 1.5 MPa (218 psi) with concrete substrate failure. All corners of the structure must be rounded to a radius of 12 mm (1/2 in).

Mixing

Consult Sikadur®-300 or 330 Product Data Sheet for information on epoxy resin.

Application

Cutting SikaWrap®
Fabric can be cut to appropriate length using commercial quality, heavy-duty scissors. Since dull or worn cutting implements can damage, weaken or fray the fibre, their use should be avoided.

Priming and Saturating
Prior to placing the fabric, prime concrete with Sikadur®-300 or Sikadur®-330 (Sikadur®-330 provides improved 'tack' adhesion, especially useful for overhead or similarly demanding applications). Sikadur® products may be spray, brush or roller applied. Saturate the SikaWrap®-1400 C using Sikadur®-300 epoxy. For best results on larger projects, the saturation process should be accomplished using an AMI Custom Fabric Saturator or similar device. In special cases, where the size of the project does not justify the use of a saturator, the fabric may be saturated by hand using a roller or a spatula, prior to placement.

Protection and overlayment

At low temperatures and/or high relative humidity it may be longer than 12 hours for the surface may become slightly tacky (amine blush). Before laying up another layer of fabric or a coating, the tackiness must be removed. This can be accomplished by washing the surface with a wet sponge or rinsing with water. To avoid this phenomenon, use the **SikaWrap® Peel Ply** *(please see below).*
To prevent exposure of the strengthening fabric to direct sunlight, top coat with Sikagard®-550 W Elastic, Sikagard® Color A50 Lo-VOC or other acceptable product. To adhere cementitious top coat systems to the cured epoxy, apply an additional layer of epoxy (15 - 20 mils) and blind (broadcast) the surface with silica sand to promote adhesion before coating.
SikaWrap® Peel Ply
If the product needs to be overcoated either with a coating (Sikagard®, etc.) or with a extra layer of fabric passing the overlay delay, apply the SikaWrap® Peel Ply **immediately after the fabric installation,** in order to protect and provide a textured surface (consult SikaWrap® Peel Ply Product Data Sheet for more informations).

Limitations

- Design calculations for the SikaWrap®-1400 C system must be made and certified by an independent licensed professional engineer.
- The SikaWrap®-1400 C system constitutes a vapour barrier.
- Protect the SikaWrap®-1400 C system from UV, using Sikagard®-550 W Elastic, Sikagard®-670 W, Sikagard® Color A-50 Lo-Voc or a similarly compatible Sika® coating.
- Do not place carbon fiber in direct contact with steel. Must be isolated (e.g. glass fabric) to protect against corrosion.

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.

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SIKA CANADA INC.
Head Office
601, avenue Delmar
Pointe-Claire, Quebec
H9R 4A9

Other locations
Toronto
Edmonton
Vancouver

1-800-933-SIKA
www.sika.ca

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