



# SikaWrap® 450A

## Aramid Fibre Structural Strengthening Fabric

### Technical Data Sheet

#### DESCRIPTION

**SikaWrap 450A** is a high performance aramid fibre structural strengthening fabric designed for on site insitu strengthening of structural load bearing elements. When used in conjunction with compatible **SikaDur®** epoxy resins, the system can provide a wet application composite strengthening system.

#### USES

To strengthen reinforced concrete, timber and masonry, structural elements on structures such as bridges, parking structures, marine structures, chimneys, silos, tunnels and tanks, pipelines etc for:

#### Loading increases

- \* Blast resistance
- \* Seismic
- \* Increasing the load capacity of floor slabs and beams
- \* Increasing the load capacity of bridges to accommodate increase axle and impact loads
- \* Installation of heavy machinery in industrial buildings
- \* Vibrating structures
- \* Change of building utilisation

#### Damage to structural components

- \* Vehicle impact
- \* Steel reinforcement corrosion
- \* Deterioration of construction materials
- \* Fire

#### Serviceability improvements

- \* Reduced deflection
- \* Stress reduction in steel reinforcement
- \* Crack width reduction
- \* Reduces fatigue

#### Change in structural system

- \* Removal of walls or columns
- \* Removal of slab sections for openings

#### Design or construction defects

- \* Insufficient reinforcement
- \* Insufficient structural depth

#### Technical Data (typical)

#### FABRIC PROPERTIES:

|  |  |
|--|--|
| <b>Colour:</b>                         | Yellow   |
| <b>Type:</b>                           | Aramid   |
| <b>Orientation:</b>                    | 0° (unidirectional)  |
| <b>Pattern:</b>                        | Warp: Aramid fibres<br>(99% of total weight)<br><br>Weft: Thermoplastic fibres<br>(1% of total weight) |
| <b>Weight:</b>                         | 450 g/m <sup>2</sup> ± 5%  |
| <b>Density:</b>                        | 1.44 g/cm <sup>3</sup>   |
| <b>Design Thickness:</b>               | 0.31 mm<br>(based on total Aramid content)   |
| <b>Tensile strength:</b><br>(nominal)  | 2880 N/mm <sup>2</sup>   |
| <b>Tensile E-modulus:</b><br>(nominal) | 100,000 N/mm <sup>2</sup>  |
| <b>Elongation at break:</b>            | 2.8%   |

All above values are approximate

#### ADVANTAGES

- \* Excellent absorption of elastic strain energy.
- \* Non corrosive.
- \* Excellent durability.
- \* Lightweight.
- \* Low overall thickness.
- \* Shear and flexural enhancement
- \* Strengthens any geometric shape
- \* Chemically resistant
- \* Economical application – no heavy handling and installation equipment.
- \* Can be coated without preparation.
- \* Low aesthetic impact.

## SURFACE PREPARATION

Concrete and masonry substrates must be sound, clean and free from laitance, ice and all surface contaminants. After preparation by grit blasting to expose coarse and fine aggregate surfaces should be vacuum cleaned. Concrete suitability should be checked using bond and substrate strength tests.

Repairs to the concrete substrate must be undertaken with structural cementitious or epoxy repair materials. Selection of materials will be dependent upon size of repair or cavity and performance requirements. (See separate product data sheets).

Bond tests should be made to ensure substrate preparation is adequate.

On corners, reprofile by grinding edges or building up with **SikaDur** epoxy mortars to provide a minimum radius of 15 mm.

## APPLICATION

### Wet Process

#### **Substrate Priming:**

Prior to placing the fabric, the substrate should be primed using **SikaDur 300**, by brush or roller. For rough surfaces use **SikaDur 330**.

#### **Fabric Saturation/Laminating**

#### **Mechanical Saturator Application:**

Pour mixed resin into saturator between rollers.

#### **Manual Application:**

Distribute 2/3 of the expected **SikaDur 300** quantity on a clean plastic (PE) sheet. Immediately place fabric into wet **SikaDur 300** and use a laminating roller in the direction of the fibres to fully saturate fabric with resin. Distribute the remaining 1/3 of the **SikaDur 300** onto the fabric and roll evenly along the fibres.

#### **Fabric Placement:**

Apply the saturated fabric onto the primed substrate within the open time of the **SikaDur 300/330** (primer application) and smooth onto the substrate by hand. Use a laminating roller in the direction of the fibres to remove voids, creases and encapsulate fibres.

The application of additional layers should take place wet on wet within the open time of the **SikaDur 300**.

#### **Protective Coatings:**

Once the system has cured, a **SikaGard**<sup>®</sup> pigmented coating maybe applied to the composite skin for aesthetic or additional ultra violet or chemical resistance. Choice of coating will be dependant on performance requirements.

As an alternative, a cementitious coating can be applied over final fabric layer by applying an additional coat of **SikaDur 330** at 0.5 kg/m<sup>2</sup> and blinding wet surface with dried quartz sand 0.7-1.2mm granulometry as a key for the coating.

## IMPORTANT CONSIDERATIONS

- ★ A suitable qualified person must be involved in the design of the strengthening works.
- ★ The application is inherently structural and great care should be taken in choosing suitably experienced specialist contractors.
- ★ A full specification should be obtained from **Sika Limited**.
- ★ Site quality control must be assured by an independent testing authority.
- ★ The **SikaWrap** fabric is pre-coated to ensure maximum bond and durability with the **SikaDur** impregnating/laminating resins. To maintain system compatibility, do not interchange system components.

**Note:** DETAILED ADVICE ON THE ABOVE SHOULD ALWAYS BE OBTAINED FROM **SIKA LIMITED**.

## CUTTING

The **SikaWrap** fabric can be cut to length using sharp commercial heavy duty scissors or shears.

## PACKAGING

Refer to latest price list.

## CONSUMPTION

**Substrate Primer:** 0.5-1.0 litres/m<sup>2</sup>

#### **Fabric Laminating/**

**Saturating Resin:** ≥1.0 litres/m<sup>2</sup>/layer

The above are guide figures. Allowances should be made for substrate irregularity and wastage.

## STORAGE AND SHELF LIFE

Unlimited if stored in dry conditions and without exposure to direct sunlight.

### Handling Precautions

Sika products are generally harmless provided that certain precautions normally taken when handling chemicals are observed. The materials must not, for instance, be allowed to come in contact with foodstuffs or food utensils and measures should also be taken to prevent the uncured materials from coming in contact with the skin, since people with particularly sensitive skin may be affected. The use of protective clothing, goggles, barrier creams and rubber gloves is required. The skin should be thoroughly cleaned at the end of each working period either by washing with soap and warm water or by using a resin-removing cream - the use of powerful solvents is to be avoided. Disposable paper towels - not cloth towels - should be used to dry the skin. Adequate ventilation of the working area is recommended. In case of accidental eye or mouth contact, flush with water - consult a doctor immediately. Health and Safety information on Sika Products is available and we strongly advise that this is read prior to their use. Sika products are for professional use and should be stored in sealed containers away from the reach of children.

### Important Note

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.

Please consult our Technical Sales Department for further information

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