

# ShaliWrap® GF

Glass Fibre Fabric for Structural Strengthening



## Description

**ShaliWrap® GF** is a high strength, high modulus unidirectional woven glass fibre fabric, designed for installation by wet application process by which it is laminated with epoxy resin saturant to form a glass fibre reinforced polymer lamination (GFRP) used in structural strengthening.

## Characteristics

The following are typical properties of the range of Glass Fibre Fabric available. They may be applied using two different techniques, namely, wet process or dry process by using the epoxy-resin based primers and saturants:

Properties	ShaliWrap GF 600 UD	ShaliWrap GF 900 UD
Fabric Weight (GSM)	600 ± 5%	900 ± 5%
Fibre Orientation	Uni-Directional	Uni-Directional
Fibre Density (g / cm <sup>3</sup> )	2.6	2.6
Fabric Thickness (mm)	0.50	0.58
Elongation at Break (%)	5.0	5.0
Fibre Tensile Strength (MPa)	> 2600	> 2600
Fibre Modulus of Elasticity (GPa)	> 72	> 72

## Application

Structural strengthening of reinforced concrete, masonry, brickwork and timber elements or structures, to increase flexural and shear loading capacity for:

- Replacing missing steel reinforcement
- Increasing the strength and ductility of columns
- Increasing the loading capacity of structural elements
- Used for shear strengthening, confinement strengthening, flexural strengthening
- Enabling changes in use / alterations and refurbishment
- Correcting structural design and/or construction defects
- Increasing resistance to seismic movement
- Improving service life and durability
- Structural upgrading to comply with current standards

## Advantages

- Multifunctional fabric for use in many different strengthening applications
- Flexible and accommodating to different surface planes and geometry (beams, columns, chimneys, piles, walls, soffits, silos, etc.)
- Available in different weights for optimum utilisation
- Low density for minimum additional weight
- Extremely cost effective in comparison to traditional strengthening techniques
- Smooth and flat fabric, enabling epoxy saturant to penetrate effectively

## Application Methodology

### ➤ Surface Preparation

As with all refurbishment work, the first step is correct surface preparation to remove any chemicals or dirt.

- If the concrete is deteriorated, remove damaged parts by manual surface preparation. Clean the steel reinforcements and remove any traces of rust by **ShaliRust® Off**. Remove all traces of rust from the reinforcement rods and protect them using **ShaliPrime® Zn**, two-component anti-corrosion zinc-rich primer, repair the surface with one-component cementitious mortar

**ShaliFix® FRM** range or epoxy material **ShaliBond® 41** or **ShaliBond® 51** as per (please refer to the relevant Technical Data Sheet for each product for application procedures).

- Wait at least three to four weeks for cementitious repair or seven days for epoxy repair before applying **ShaliWrap® GF**.
- All concrete must possess an open surface texture with all paints, curing compounds and sealers removed.
- All bug holes, depressions, imperfections, cavities, etc., shall be repaired by using **ShaliFix® 3EP** epoxy putty.
- Internal and external corners should be rounded to a bending radius of at least 2 cm to eliminate the stress concentration at the corners and junctions.

#### ➤ **Material Preparation**

- The **ShaliWrap® GF** fabric shall be cut into required size before application starts with scissors/knife as per site requirements.
- Roll the fabric for handling purpose. Do not folding the fabric.
- Prepare the **ShaliBond® GCW 340** by mixing component A (Resin) & B (Hardener) thoroughly by using slow speed drill mixer with a spiral type blade at the bottom of stirrer rod. Mix till homogeneous mix is obtained.
- Prepare the **ShaliBond® GCW 310 saturant** by mixing component A (Resin) & B (Hardener) thoroughly by using slow speed drill mixer with a spiral type blade at the bottom of stirrer rod. Mix till homogeneous mix is obtained.
- After stirring and mixing, wait for the product to settle in order to let entrapped air escape
- **ShaliWrap® GF** is applied on the prepared concrete surface using the dry or wet impregnation technique.

#### ➤ **Application of Material**

- Apply an even coat of **ShaliBond® GCW 340** onto the clean and dry concrete surface with a roller or a brush. If the substrate is very porous, apply a second coat of **ShaliBond® GCW 340** after the first coat has been completely absorbed.
- Then smoothen the primed surface and fill the bug holes, imperfections using epoxy putty **ShaliFix® 3EP**. Application thickness and coverage rates will be highly dependent on the condition and profile of the concrete substrate.
- **ShaliBond® GCW 340** must be allowed to cure until tack free.
- Impregnate the **ShaliWrap® GF** fabric manually on a table over a plastic sheet using the saturant **ShaliBond® GCW 310**.
- Pre wetted **ShaliWrap® GF** is applied on the sealed surface. The fabric is rolled with a plastic roller strictly in the fibre direction.
- When wrapping, the **ShaliWrap® GF** roll must be overlapped at least 15 cm with the same fabric. The same procedure must be followed when several strips need to be joined longitudinally.
- In cases where more than one layer of fibre sheet is to be applied, the above application method should be repeated.

#### ➤ **Finishing**

- In case of protection with plaster, ensure to sprinkle oven dried fine quartz grains to assist bond strength with the plaster.
- When exposed to direct sunlight or in other cases, the wrapped surface must be overcoated with **ShaliProtek 2AC PU TC** or **ShaliUrethane PU TC 2K UV Resistant Top Coat**.

## **Cleaning & Maintenance**

Clean tools and equipment with solvent before the material hardens.

## **Health & Safety**

- Avoid contact with skin / eyes and avoid swallowing.
- Ensure adequate ventilation and avoid inhalation of vapour.
- Wear suitable protective clothing, gloves and eye protection.
- In case of skin contact, rinse with plenty of clean water, then cleanse with soap and water. Do not use solvent to clean the contacted area.
- In case of eye contact, wash with plenty of clean water and seek medical advice.
- If swallowed, seek medical attention immediately. Do not induce vomiting.

## Packaging

ShaliWrap GF is available in roll size of 50 m and 100 m having width of 0.5 m or 1 m.

## Storage

Keep in cool and dry place, under shed, away from heat and moisture.

## Shelf Life

12 months in original unopened sealed condition.



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