

## Estowrap 300H

### High Strength Carbon Fiber Sheet for Structural Strengthening System at Concrete Structure

#### Description

**Estowrap 300H** is a high tensile strength, high elastic modulus sheet of longitudinal oriented continuous carbon fiber element which are held in position by lightweight, open mesh scrim. FRP material can have as much as 10 times the tensile strength of steel.

When used in conjunction with a specially developed primer, improves structural performances by strengthening and improving shear strength and deformation properties.

This FRP material design follows the **ACI 440.2R-17** reference standard as the design standard.

For composite material pass **ASTM D3039**

#### Uses

**Estowrap 300H** is used for strengthening columns and beams of load bearing structures specifically where improvement to shear strength and deformation properties is required. Typical applications include piers, columns, connecting beams and slabs of railway and road bridges, buildings and tower. In the following structures:

- Commercial, high rise
- Industrial plants
- Warehouse
- Bridges, tunnels, jetties
- Pipes, culvert, chimneys
- Power station plants

#### Advantages

- Exhibit high tensile strength and elastic modulus
- Good dimensional stability
- High impact resistant
- Resin is of high chemical resistant
- Imparts very low electrical conductivity
- Will not corrode
- Lightweight hence easy to handle and use
- Carbon reinforced hence good thermal expansion
- High shear stress and cut resistance

#### Durability Description

**Estowrap 300H** high performance fabric sheet which is encapsulated in **Estowrap 300H** resin to provide properties of high strength and high elastic modulus. Its low density properties, specific strength and modulus are extremely high compared with conventional materials such as steel and concrete.

**Estowrap 300H** is extremely easy to handle and apply with no noise and minimal site equipment necessary allowing quick and easy reinforcement of structural members without major disruption.

**Estowrap 300H** is lightweight, has high impact resistant, excellent tensile strength, is extremely stable at high and low temperatures and has excellent chemical resistance under a variety of exposure conditions.

#### Physical Properties

| Product Name         | Areal Weight (g/m <sup>2</sup> ) | Fabric Thickness (mm) |
|----------------------|----------------------------------|-----------------------|
| <b>Estowrap 300H</b> | 300                              | 0.166                 |

|                         |                             |
|-------------------------|-----------------------------|
| Type                    | Carbon fiber                |
| Tensile Strength        | 4900 N/mm <sup>2</sup>      |
| Fiber Strength          | 4900 MPa                    |
| Fiber Stiffness         | 230 GPa                     |
| Density                 | 1.8 – 2.0 g/cm <sup>3</sup> |
| Elongation at break     | >2.1 %                      |
| Fiber Tensile E-modulus | 230 GPa                     |
| Style                   | Woven UD                    |
| Rupture Strain          | Min 1.5 %                   |

## EstoWrap Resin Adhesive

|                                 |           |
|---------------------------------|-----------|
| Adhesive Strength               | >1.5 MPa  |
| Shear Strength                  | >30 MPa   |
| Compressive Strength            | >60 MPa   |
| Flexural E-Modulus (ASTM D790)  | >3500 MPa |
| Flexural Strength (ASTM D790)   | 120 MPa   |
| Tensile Strength (ASTM D638)    | 73 MPa    |
| Tensile Modulus (ASTM D638)     | 3.18 GPa  |
| Elongation at break (ASTM D638) | 5.0%      |

## Composite Gross Properties pass ASTM D3039

|  |          |
|--|----------|
| Ultimate Tensile Strength (ASTM D3039) | >998 MPa |
| Elongation at break (ASTM D3039)       | >1.8 %   |

## Instruction to Use

### Preparation

Concrete surface must be dry, smooth, sound free from debris and loose material. Surfaces must be fully cured and free from contamination. Thorough preparation of the substrate is vital with light grit blasting recommended to remove all deleterious substances and provide a suitable key. All dust and debris must be removed prior to proceeding. Blow holes or imperfections should be filled with Estorex Putty or Estocrete WR prior to application of EstoWrap Primer.

### Priming

The base and hardener components of EstoWrap Primer should be thoroughly stirred before the two are mixed together.

Pour hardener into suitably sized mixing vessel and add the base resin into the hardener. The use of heavy duty slow speed, flameproof or air driven drill fitted with a mixing paddle is desirable. Mix these components in the quantities supplied taking care to ensure all containers are scraped clean.

Apply EstoWrap Primer to the prepared substrate using a stiff brush, working the primer well into the substrate at a coverage rate of 0.3 kg/m<sup>2</sup>

### Application

Arrange enough material, manpower and equipment to carry out the application within the resin pot life. The base and hardener components of EstoWrap Resin should be mixed as per mixing instruction of EstoWrap Primer. Apply the EstoWrap Resin to primed surface, using roller at the rate of 0.6 kg/m<sup>2</sup>. Immediately after application of the resin, the pre-cut **Estowrap 300H** Carbon Fabric Sheet (maximum 4m length) should be applied using rubber or plastic scraper.

Remove the release paper from the **Estowrap 300H** Carbon Fabric sheet and roll it with an impregnation roller in a direction parallel to the fibers in the carbon sheet.

After 30 minutes of the impregnation and within 3 hours, apply a second coat of EstoWrap Resin at a coverage rate of 0.6 kg/m<sup>2</sup> to completely encapsulate **Estowrap 300H** Carbon Fabric Sheet.

### Other Applications

**Estowrap 300H** can be used as external strengthening nearly anywhere additional reinforcement is required.

Blast mitigation for concrete and masonry walls

Strengthening for pressure in pipes, silos, and tanks

Reinforce around steel, slab and wall openings

Strengthening domes, tunnels, and chimneys

## Important Note

*Estop products are guaranteed against defective materials and manufacture and are sold subject to its standard Terms and Conditions of Sale, copies of which may be obtained on request. Whilst Estop endeavors to ensure that any advice, recommendation, specification or information in may give is accurate and correct, it shall not, because it has no direct or continuous control over where or how its products are applied, accept any liability either directly or indirectly arising from the use of its products, whether or not in accordance with any advice, specification, recommendation or information given by it.*

**Limitation**

**Estowrap 300H** should be protected via over coating with a PU based UV resistant coating within 6 hours of application.

**Packaging****EstoWrap Resin**

Hardener 5 kg

Base 10 kg

**Estowrap 300H Carbon Fiber Sheet**

0.5m(W) x 100m (L)

**Coverage**

EstoWrap Primer 0.3kg/m<sup>2</sup>

EstoWrap Resin 1.2 kg/m<sup>2</sup>/2 coats

**Technical Support**

Estop offers a technical support package to specifiers, end-users and contractors, as well as on-site technical assistance.

**Storage**

Store on pallets in dry conditions. EstoWrap Primer has a shelf life of 12 months, If stored in extreme heat condition, the shelf life may be reduced.

However, **Estowrap 300H** Carbon Fiber Sheet have an unlimited shelf life but must be stored in dry condition.

**Additional Information**

Estop manufactures and offers a wide range of complementary products, which includes waterstops, waterproofing products, grouts, anchors, specialized flooring products. In addition, a wide range of products formulated for repair and refurbishment of spalled concrete are available.

Rev 01/tech/V/20

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