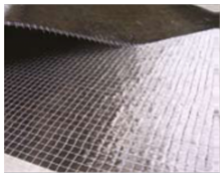
TEJIDO CARBOTEC



High-strength carbon fibre fabric for structural reinforcement

DESCRIPTION

The Tejido Carbotec System is composed of a unidirectional carbon fiber fabric wrapped in a weft of glass thread covered with thermoplastic material that allows to maintain the position of the carbon fibres during its implementation. It is supplied in rolls of different widths and lengths.

ADVANTAGES AND USES

- Increased strength and ductility in columns.
- Increase in axial load by wrapping the column
- Only high quality fibres are used in manufacturing.
- Great freedom of design.
- Clear advantages over steel plates in certain applications.
- Can be applied to beams, columns, floors and walls, both on concrete and wooden supports.
- Long-lasting reinforcement against both positive and negative bending deformations.
- Light and flexible: No heavy machinery required.
- Corrosion resistant: does not require additional treatment.
- No difficulty in connections or transitions.
- Less risk of buckling.
- Low aesthetic impact.
- Recessed in the support by means of carbon fibre connectors.

Field of application

The Malla Carbotec System of the unidirectional (UD) type is used for the subsequent reinforcement of concrete, wood and masonry elements.
The reinforced concrete elements are calculated and designed for a predetermined load. These loads can change over the lifetime of the construction, and the initial calculations may be insufficient due to

- Openings cutting slabs in floors or beams.
- Increased loads due to change of use of the construction.
- Ageing of building materials.
- Corrosion of the reinforcement.
- Degradation of the concrete.
- Cutting of pre- or post-tensioning cables.
- Fire damage at certain points in the construction.
- Past or potential earthquakes.

The Malla Carbotec UD type System is used to reinforce columns, beams, chimneys, silos, tunnels and other construction elements that are subject to unfavourable loads. The meshes offer a unique solution for the reinforcement of composite shapes because they can be adapted to the contour of the element.
This allows the designer to reinforce pillars with a circular, square or rectangular cross-section (by rounding off the corners); arched tunnel segments, tubes and chimneys not possible with the Carbotec film because of its greater geometric limitation.
The Tejido Carbotec System is also ideal as an anchorage base for the Carbotec Foil System.

SUITABLE SUBSTRATES

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- The adhesion of the prepared substrate must be checked by means of a random spot adhesion test. The concrete must have a minimum adhesion of 1.0 N/mm2.
- The surface temperature of the element in question should be at least 8°C, and at least 3°C above the dew point temperature.
- When using Carbotec Impregnant (waterproof) Adhesive, the maximum moisture content in the concrete should be < 4%.

Concrete and masonry:

- In order to ensure an optimal load distribution of the substrate to the Tejido Carbotec System, the surface has to be rough, which can be achieved by sandblasting. All damaged areas (cracks, cokes and surface deficiencies) must be repaired before applying the Tejido Carbotec System.

Wood:
The surface must be brushed or ground. Dust must be removed with a hoover.

APPLICATION PROCEDURE

1. Surface preparation

- The roughness of the support, when excessive, must be filled and levelled with suitable materials.
- It is recommended to apply Implarest EPT when the quality of the concrete is insufficient.
- Give a minimum radius of 2.5 cm to the angular corners.

2. Preparation of the Tejido Carbotec UD type System

- Carbotec Fabric can be cut with normal scissors.

3. Preparation of Carbotec Impregnant Adhesive (waterproof)

- Mix both components of the adhesive before applying it.
- Mix component A and B in a clean container and mix thoroughly for 3 minutes with a low-speed mixer until a grey mixture is obtained. Mix only the amount of product that can be applied within the life of the Impregnant Adhesive mixture.
- Mixing ratio A/B = 2/1

4. Application of Tejido Carbotec System.

- Apply the Carbotec Impregnant Adhesive with a roller in level thickness following the consumption that can be seen on page 3.
- Press the carbon fibre fabric against the epoxy resin with a special roller. Always work from the front to back in the direction of the carbon fibres. Start at one end and work towards the other or start in the middle and move sideways. This will remove all the occluded air.
- Apply a second layer of Carbotec Impregnant Adhesive on top of the carbon.
- To apply a second layer of Tejido Carbotec, repeat the above procedure. The second layer is applied wet on wet to the last layer of Carbotec Impregnant Adhesive, within the life time of the mixture mentioned in its technical data sheet.
- When the Tejido Carbotec System is applied to the cured carbon fibre sheet or laminate, the surface has to be prepared using an approved method.
- The material must not be touched until 24 hours after application. Carbotec Impregnant Adhesive reaches full mechanical resistance after 7 days from application.

RECOMMENDATIONS

- Cut the fabric with scissors or with a knife and ruler.
- Never fold the fabric in the longitudinal direction (only fold it parallel to the fibre).
- The smallest radius for corner reinforcement: > 25 mm.
- In the direction of the fibre, the length of the overlap must be at least 200 mm.
- During application, observe the life time of the adhesive (maximum polymerisation time).
- The fabric can be covered by sprinkling silica with Carbotec Impregnant Adhesive and so that it is covered with a final layer of protective mortar.

CONSUMPTION ACCORDING TO DIMENSIONS (KG/M²)

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The consumption depends on the conditions of the building site and the number of layers calculated.

Consumption will depend on the flatness and roughness of the support. Consumption may be higher than shown below:

Malha Carbotec	Carbotec Impregnante
200 g/m^2	Aprox. 700 g/m^2
300 g/m^2	Aprox. 900 g/m^2
400 g/m^2	Aprox. 1100 g/m^2
500 g/m^2	Aprox. 1300 g/m^2
600 g/m^2	Aprox. 1500 g/m^2

PACKAGING AND STORAGE

Tejido de fibra de carbono de alto rendimiento / unidireccional (longitudinal), negra en rollos.
Sistema Tejido Carbotec tiene que ser almacenado en un sitio seco, ambiente libre de polvo y lejos de la luz solar directa.

TECHNICAL DATA

Technical Data / Weight	200 g/m^2	300 g/m^2	400 g/m^2	500 g/m^2	600 g/m^2
Modulus of elasticity (GPa)	240	240	240	234	251
Tensile strength (N/mm2)	4.900	4.900	4.900	4.830	5.014
Fiber weight (g/m2) Main direction	200	300	400	500	600
Weight per unit area of film (g/m2)	217	322	418	514	618
Density (g/cm3)	1,7	1,7	1,7	1,7	1,7
Elongation at break (%)	2	2	2	2	2
Total thickness (mm)	0,21	0,31	0,40	0,49	0,59
Thickness for calculation (fibre weight/density) (mm)	0,123	0,182	0,35	0,288	0,347
Theoretical calculation cross section per 1000 mm width (mm2)	123	182	235	288	347
Reduction and calculation factor (manual lamination / UD film)	1,2 (recommended by GP)	1,2 (recommended by GP)	1,2 (recommended by GP)	1,2 (recommended by GP)	1,2 (recommended by GP)
Ultimate tensile strength 1,000 mm width (kN)	123 x (4.900/1,2) = 502,25	182 x (4.900/1,2) = 743,16	235 x (4.900/1,2) = 959,58	288 x (4.830/1,2) = 1.159,20	347 x (5.014/1,2) = 1.449,88
Pulling force for 1000 mm width at 0.6% for calculating (kN)	150,67	222,95	287,87	347,76	434,96
Presentation:(Special films on request)	Roll 30 m2 Length 100 ml Width 0,30 ml	Roll 30 m2 Length 100 ml Width 0,30 ml	Roll 30 m2 Length 100 ml Width 0,30 ml	Roll 30 m2 Length 100 ml Width 0,30 ml	Roll 30 m2 Length 100 ml Width 0,30 ml

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