

# STRUCTURAL REINFORCEMENT BY GLUING AND IMPREGNATING CARBON FIBER FABRICS

## Reinforcement of RC elements

### APPLICATION DATA SHEET

Structural reinforcement by gluing and impregnating carbon fiber fabrics, through:

1. cleaning and regularizing the substrate;
2. priming;
3. laying of the epoxy adhesive;
4. application of the tissue;
5. soaking;
6. anchoring;
7. Skimming

#### 1) CLEANING AND REGULARIZING THE SUBSTRATE

If it is necessary to carry out a restoration, prepare the surface completely removing the deteriorated concrete by hand or mechanical chipping or by other suitable means, such as hydro-scarifying, in order to obtain a solid substrate, free of loose parts and sufficiently rough. Remove the rust from the exposed bars bringing the surface back to "white metal" conditions. Clean the substrate from dust, grease, oils and other contaminants. Wet the substrate until it is saturated, but dry on the surface (s.s.d. Conditions), and restore the surface with suitable mortar from the BETONFIX kimifer n line. Wait for the restored part to completely dry before applying the primer.

If the restoration of the reinforced concrete is not necessary, proceed with the shoring of the structures subject of the intervention. Round off any edges (minimum radius of 2 cm). Plate surfaces with a tensile strength greater than 1.5 mpa.

Clean the substrate in order to eliminate flimsy parts and any material that could compromise the good anchoring of the following procedures.

Carefully grout any cracks or micro-cracks with suitable

mortars (consult our technical department).

#### 2) PRIMING

On substrates that require pre-consolidation, apply on the treated surface two-component synthetic resin primer in water dispersion Kimicover FIX with a minimum consumption of 0.2 kg / m<sup>2</sup>.

#### 3) LAYING OF THE EPOXY ADHESIVE

Spread the two-component epoxy resin Kimitech CMP. The product will have the function of levelling the surface to be reinforced and creating an adhesive layer for the subsequent application of the reinforcement. The minimum consumption is 1,2 Kg/m<sup>2</sup>.

#### 4) APPLICATION OF THE TISSUE

Place tissue Kimitech CB or Kimitech CBA (previously cut to size), still dry, in the direction and position required by the project, directly on fresh Kimitech CMP.

Press the fabric into the resin layer, using a roller for composites (always roll in the direction of fibres, exerting slight pressure paying attention not to move the fabric during this phase).

Roll until the resin emerges between the fibres and completely soaks them, forming a uniform layer on the tissue.

Eliminate any air bubbles that could be trapped between the fabric and the substrate, continuing to roll in the direction of the fibres.

#### 5) SOAKING

Soaking, when still fresh, with solvent-free two-component fluid epoxy resin with medium viscosity Kimitech CMP applied slowly by brush or roller in several layers until the soaking of the tissue is complete. Consumption will vary according to the weight of the

fabric (see the Technical Data Sheet).

Any additional reinforcement layers should be applied fresh on fresh and immediately soaked with resin Kimitech CMP. If it is not possible, proceed immediately with the application of the next layer of tissue, dust with fresh quartz sand, wait at least 12 hours (at + 23°C), then apply a layer of epoxy resin Kimitech CMP (minimum consumption 0,5 – 0,8 Kg / m<sup>2</sup>) and proceed with the application of further layers. As an alternative to dusting with quartz sand, after at least 12 hours (at + 23°C), sand the surface of the first lamination with abrasive paper (60 grit), carefully remove the dust, then apply a layer of epoxy resin Kimitech CMP (minimum consumption 0,5 – 0,8 Kg/mq) and proceed with the application of further layers. In the case of applications that cover a very long surface and require the use of more pieces of tissue, any subsequent overlapping with other layers of tissue must be offset from each other along the direction of the fibres, so as not to make the joint position in the various layers coincide.

## 6) ANCHORING

For the anchors, which are necessary as a safety device against delamination at the ends of the reinforcements when working on particularly poor supports, in case of orthogonal thrusts to the laying surface (which can be generated in the case of intradossal reinforcements of vaults) or concave angles (hooping of masonry pillars and stone materials characterized by articulated geometries) the connectors to be used should be made on site (Kimitech FIOCCO CB) and/or be preformed (Kimitech FRP-LOCK).

Preparation of the connectors made with Kimitech FIOCCO CB:

- cut to length of the connector;
- cut of the polypropylene tape at the extremity;
- unravelling of the extremity;
- soaking on site;
- lengthwise rolling up of the tape.
- quartz dusting of the impregnated part

Drill holes in the substrate, on which the reinforcement has previously been applied, in order to fasten the connectors used as connection systems and anti-delamination reinforcements.

The size of the hole must be proper in relation to the equivalent diameter of the chosen connector. Insertion of the previously prepared connector and grouting through fluid epoxy resin Kimitech CMP.

Unravelling of the connector on the reinforcement's surface and soaking using fluid epoxy resin Kimitech CMP.

## 7) SKIMMING

While fluid epoxy resin, applied on the surface of the foil, is still fresh, dust fine quartz sand (max ~ 1 mm) able to guarantee an adequate surface roughness for the subsequent skimming to be carried out with a ready-to-use skimming mortar, grey or white, Betonfix RS, which must be applied after at least 7 days after the laying of the reinforcement.

Dusting is not necessary if you intend to protect the reinforcement with a simple protective coating.

## POSSIBLE ALTERNATIVES

-As an alternative to Kimitech CMP for grouting it is possible to use: Kimitech EPOXY CTR, two-component epoxy resin in cartridge.

-As an alternative to Betonfix RS it is possible to perform the skimming by applying ready-to-use one-component water-repellent protective skimming mortar with aggregates of maximum grain size 0.5 mm Betonfix R30, white or grey, or with ready-to-use one-component hydrophobic protective skimming mortar with aggregates of maximum grain size 0.7 mm Betonfix R52, white.