FIXING ORNAMENTAL ELEMENTS.

IS IT:

- [X] *Product*
- [X] *Technology*
- [ ] *Equipment*

APPLICABLE FOR:

- [X] *Restoration*
- [X] *Rehabilitation*
- [ ] *New Construction*

APPLICABLE ON:

- [ ] *1. Foundations and underground structures*
- [ ] *2. Vertical structures*
- [ ] *3. Horizontal structures and vertical connections*
- [X] *4. Roof and terraces*
- [X] *5. Façade and building envelope*
- [ ] *6. Finishes and completion elements*
- [ ] *7. Integrated services*
- [ ] *8. General strategies for building recovery*

Related companies: *MAPEI*

DESCRIPTION

Carbon fiber or unidirectional fiberglass rope is used in structural and functional rehabilitation of concrete and masonry elements, including those of historical-monumental value, damaged by the passage of time and natural causes.

MapeWrap C FIOCCO and *MapeWrap G FIOCCO* are systems for making connections by inserting them into existing masonry elements, in order to guarantee a better connection between supports (concrete, stone, brick, wood, etc.) and ornamental elements, avoiding the use of metal fasteners.

WHY TO USE

MapeWrap C FIOCCO and *MapeWrap G FIOCCO* have the following characteristics:

1. High tensile strength
2. Lightweight
3. Resistance to alkaline hydroxides in concrete
4. Corrosion resistance, even in the presence of chlorides or other aggressive substances
5. Optimum fatigue resistance.

HOW TO USE AND APPLY

1. Preparation of the support. If the structure or support where the fioccos are to be inserted is degraded, clean the various elements before applying *MapeWrap Fiocco*.

   It is recommended to eliminate the deteriorated parts by manual or pneumatic grinding, or by hydrodemolition. If there are metallic reinforcements, clean the eventual remains of rust and protect them with anticorrosive cementitious mortar.

2. Drilling of holes. Available diameters 6,8,10 and 12 mm. It is necessary to drill holes of a diameter depending on the "fiocco", with a minimum depth of 20 cm, on the element in which the insertion is to be made, in order to guarantee an adequate anchorage with the support. Once the hole has been drilled, remove loose parts and vacuum all dust.

3. Preparation and application of *MapeWrap Primer 1*. Preparation of the bi-component resin according to the dosage ratio, once prepared, respect the working times and temperatures. Apply the product inside the hole with the help of a swab.

4. Insertion of *MapeWrap C Fiocco/ MapeWrap G Fiocco*. Once the hole filling operations have been completed, insert the previously prepared *MapeWrap FIOCCO*, slowly and accurately, to facilitate the removal of the excess product. Remove this material with a metal spatula. To limit the thickening of the sections where *MapeWrap FIOCCO* is applied and to increase its adhesion, the remaining part of the "fioccos" (not inserted in the holes) should be arranged in a fan shape on the structure to be connected, using *MapeWrap 31*, *MapeWrap 11* or *MapeWrap 12*, making sure to completely impregnate the fibers and to apply a first coat to the substrate before applying the "fiocco". Spread dry quartz aggregate on the fresh resin to create a bonding surface for subsequent operations.

   Apply a second coat of *MapeWrap 31* and then pass the *MapeWrap Roller* over it several times to allow the adhesive to completely impregnate the fabric fibers and to eliminate any air bubbles occluded during the previous operations.

5. Protective coating. The protective coating can be made, once the hardening of the epoxy system used has been completed, using different cycles depending on the finish to be obtained, such as elastic cementitious mortar, elastic acrylic paint, single-component cementitious mortar, pozzolanic reactivity cementitious mortars, hydraulic lime cementitious mortar, Eco-Puzolana, etc.

TECHNICAL CHARACTERISTICS

***MapeWrap C FIOCCO* composed of unidirectional carbon fibers:**

Fiber type: high strength carbon

Appearance: rope composed of unidirectional fibers housed in a protective net.

Density: 1.8 g/cm3

Tensile strength: 4830 N/mm2

Elongation at break: 2%.

Equivalent area of dry fabric:

Diameter 6 mm 15.70 mm2

Diameter 8 mm 21.24 mm2

Diameter 10 mm 26.79 mm2

Diameter 12 mm 31.40 mm2

***MapeWrap G FIOCCO* composed of glass fibers:**

Type of fiber: type E glass

Appearance: rope composed of unidirectional fibers housed in a protective net.

Density: 2,62 g/cm3

Mechanical tensile strength: 2560 N/mm2

Elongation at break: >3%.

Equivalent area of dry fabric:

Diameter 6 mm 16.34 mm2

Diameter 8 mm 21.45 mm2

Diameter 10 mm 27.58 mm2

Diameter 12 mm 32.69 mm2

RECOMMENDATIONS AND OTHER INFORMATION

The temperature during installation should not be below +5°C and the structure should be protected from rain or possible windblown dust.

Once the intervention has been carried out, keep the treated surfaces at a temperature above +5°C until the products have cured.

Protect surfaces from rain for at least 24 hours, if the minimum temperature does not fall below +15°C, and for at least 3 days if the temperature is lower.

Use of products that generate a barrier against ultraviolet rays. The use of products with these characteristics is especially indicated when the elements to be repaired/restored are exposed to sunlight.

During use, it is recommended to wear protective gloves and goggles.

EXAMPLES

https://www.mapei.com/it/it/realta-mapei/dettaglio/con-nuovi-materiali-ricostruito-il-contesto-dell-opera-originale-per-casa-battlo

REFERENCES / SOURCES AND LITERATURE

https://www.youtube.com/watch?v=KxnIwKY75wE

https://www.mapei.com/app/pdfjs/web/viewer.html?file=https%3A%2F%2Fwww.mapei.com%2Fdocs%2Flibrariesprovider47%2Frealta-mapei-magazine%2Frealidad_mapei_27.pdf%3Fsfvrsn%3Dbe6f971_44

WEBSITE OF THE COMPANY

https://cdnmedia.mapei.com/docs/librariesprovider47/products-documents/1012-1017-mapewrapc-gfiocco-es.pdf?sfvrsn=7aaf9f4a_0

IMAGES AND CAPTIONS

Fig.1-2: Fioccos.
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Fig.3-6: Application in Casa Batlló's roof ornaments. Use of carbon fibers and lime mortar to fix the decorative spheres on top of the roof chimneys. Carbon fibers that replace the previous iron rods, which on the outside and over the years, came to produce breakage of the original spheres. ©*Joan Olona & Mireia Bosch*