FLUECO 80 T FIBER

THIXOTROPIC, FIBRE-REINFORCED CEMENT MORTAR WITH SHRINKAGE COMPENSATION

Ideal for structural restorations in very aggressive environments
Layer thickness up to 5cm without electro-welded mesh

R4 UNI EN 1504-3 | CE EN 1504-3 | CONTROLLED SHRINKAGE | LAYER THICKNESSES UP TO 5 CM PER COAT | SULPHATE RESISTANT | DUAL FIBER TECHNOLOGY

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CEMENT-BASED THIXOTROPIC MORTARS FOR CONCRETE RESTORATION

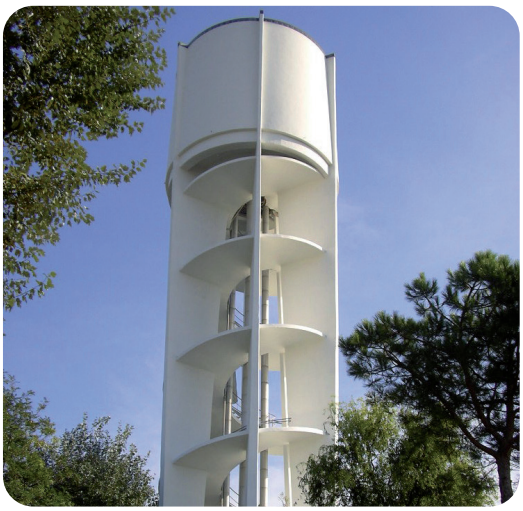
FLUECO 80 T FIBER is a one-component, pre-blended cement-based mortar. It is fibre-reinforced with polymer fibres with micro-structural action and reinforced with flexible inorganic alkali-resistant fibres made of stainless steel. It is mixed with water to obtain a thixotropic mix that is shrinkage-compensated in air. **FLUECO 80 T FIBER** develops high initial and final mechanical strength. It is waterproof and durable even in very aggressive environments and it provides strong bonding to steel and concrete.

FLUECO 80 T FIBER is resistant to chemical and environmental attacks and is suitable for all the classes of exposure required by UNI 11104.

BENEFITS

The characteristics of FLUECO 80 T FIBER make it suitable for structural repairs of concrete buildings subject to high physical, chemical and environmental attacks. FLUECO 80 T FIBER can also be applied by spraying without requiring any electro-welded mesh. The specific characteristics of the product are:

- ✓ **RESISTANCE TO SULPHATES AND CHEMICAL AND ENVIRONMENTAL ATTACKS: FLUECO 80 T FIBER** has high compactness, low capillary porosity and high resistance to aggressive agents present in the environment such as chlorides and sulphates.
- ✓ **IMPERMEABLE TO WATER AND CARBON DIOXIDE:** thanks to the chemical and physical characteristics of its components **FLUECO 80 T FIBER** is totally waterproof, resistant to freeze thaw cycles and is not subject to carbonation.
- ✓ **CAN BE APPLIED WITHOUT ELECTRO-WELDED MESH:** The specific formulation of **FLUECO 80 T FIBER**, together with its flexible inorganic fibres remove the necessity for the installation of electro-welded mesh, thus facilitating installation.
- ✓ **ABSENCE OF CRAZING AND CRACKS CAUSED BY PLASTIC SHRINKAGE: FLUECO 80 T FIBER** has no crazing or plastic shrinkage cracks thanks to the use of special synthetic fibres that impede cracking.
- ✓ **CONTRASTED EXPANSION DURING AIR CURING:** used together with the curing additive PRESIDIO SRA it permits the development of expansive properties even when cured in the open air.
- ✓ **HIGH ADHESION TO THE SUBSTRATE:** the specific formulation of **FLUECO 80 T FIBER** has been specifically formulated to ensure increase adhesion between mortar and substrate, thus facilitating instalment.



WHERE TO USE

FLUECO 80 T FIBER should be used for the structural repair, maintenance and restoration of damaged concrete and reinforced concrete structures exposed to aggressive environments. **FLUECO 80 T FIBER** is particularly suitable for:

- ✓ structural repair to pillars, beams, floors and walls in reinforced cement, including pre-cast elements, exposed to sulphur attack;
- ✓ restoration and lift of concrete buildings by casting with thickness up to 5 cm per layer;
- ✓ hydraulic works, viaducts, pillars and tunnels, including structures in contact with sea-water;
- ✓ repair of the cortical layer of concrete and repair of detached rebar cover caused by oxidation of the rebars themselves.

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REFERENCE STANDARDS

FLUECO 80 T FIBER meets the requirements defined by EN 1504-9 "Products and systems for the protection and repair of structures: definitions, requirements, quality control and evaluation of conformity" general principles for the use of products and systems."

FLUECO 80 T FIBER meets the minimum requirements defined by EN 1504-3 "Structural and non-structural repair" for structural mortars of class R4."

TECHNOLOGY

RESTRAINED EXPANSION IN AIR

The addition of PRESIDIO SRA to the mortar enhances the **expansive properties** even when the curing environment is not sufficiently damp, thus ensuring top performance in real jobsite conditions. The shrinkage control gives the mortar dimensional stability and avoids cracking, thus providing improved bonding of the mortar and monolithic adhesion to the substrate.

Warping test: It is possible to assess the product's ability to guarantee the correct contrasted expansion in the open-air by preparing a sample of approx. 100x5x2. The arching of the sample after just 24 hours demonstrates the actual expansion behaviour of the mortar.

CHARACTERISTICS OF THE FIBRES

Flexible inorganic alkali-resistant fibres.

TECHNICAL SPECIFICATIONS

DIAMETER	14 micron
MODULUS OF ELASTICITY	72 GPa
TENSILE STRENGTH	1700 MPa

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APPLICATION PROCEDURE

SUBSTRATE CLEANING

- **Remove all flaking parts** from the concrete in the area to be repaired, including grout slurry, either by mechanical chipping or pressure washing and taking care not to damage the structures;
- **Remove spots, efflorescence or soaked-in stains** of grease oils, paints, lime, dust, dirt etc.;
- **Remove any earlier repairs** if irreparably damaged or deteriorated;

SUBSTRATE PREPARATION

- **Roughen the surface** mechanically by bush hammering, chiselling or pressure washing (this last avoids damage to the substrate and is recommended for large areas) to reach the sound, compact concrete and enhance bonding between the mortar and substrate. The surface should be roughened with unevenness to a depth of at least 5 mm while the edges around the area to be repaired must be scarified to a depth of at least 10 mm with a sharp edge finish. Roughening of the surface layer is needed both to promote bonding of the mortar, and to ensure the expansive properties develop correctly.
- **Wet the surface with water under pressure to saturation.** This procedure avoids the substrate absorbing water from the mix as this could lead to cracking and reduce the bonding strength of the mortar. This operation also allows the removal of any fragments remaining from the roughening of the concrete substrate. Excess water must be removed with compressed air jets or with cloths.

REBAR PROTECTION

- **Sandblast the rebars** and remove all loose particles such as rust flakes or fragments of material that could lead to corrosion or impair bonding. Scarification of the substrate with hydro-blasting also effectively cleans the bars, making sandblasting unnecessary.
- **Protect the reinforcement bars** by re-alkalising them with the corrosion-inhibiting agent DRACOSTEEL.

ADDITIONAL REINFORCEMENT FOR STRUCTURAL REQUIREMENTS

At the request of the designer for technical and structural reasons, it is possible to apply electro-welded mesh with the use of spacers (at least 1 cm from the substrate) and rebar covers of at least 1.5 - 2 cm.

MORTAR PREPARATION

The mixing of the mortar **FLUECO 80 T FIBER** is carried out using an on-site concrete mixer. Pour the mixing water into the cement mixer according to the recommended mixing ratio indicated in the Table. Add slowly, mixing for at least 4 to 5 minutes until the mix is smooth and free of lumps. Make sure that all the product has been properly mixed in and that there are no residues of powder on the sides or bottom of the concrete mixer. To prepare small quantities of product use a suitable vessel or container and respect the recommended mixing proportions. We recommend the use of a mechanical agitator at low speed to reduce air entrainment. PRESIDIO SRA, added to the mix at a dosage of 1 % on the weight of the mortar (0.25 kg per bag) acts as internal curing, and **enhances the expansive properties in the open air**. PRESIDIO SRA affects the curing of the mortar, so the dosage should be adjusted on the basis of the ambient temperature. In warm climates PRESIDIO SRA permits good workability; when ambient temperatures range between 5 and 10 ° C we recommend reducing the dosage to avoid excessive slowing down of the setting time.

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PRECAUTIONS IN HOT CLIMATES

- Store **FLUECO 80 T FIBER** away from direct sunlight;
- use low temperature mixing water
- carry out the work in the early hours of the morning, and stop work when the sun is strongest. It is better to resume working in the late afternoon, as long as the structure has been wet continuously for at least 6 hours before work starts;
- to achieve optimum performance from **FLUECO 80 T FIBER** you should ensure proper curing by applying PROBETON CURING N by spray or by brush.

PRECAUTIONS IN COLD CLIMATES

- Store **FLUECO 80 T FIBER** in a heated environment where possible;
- use heated mixing water;
- do not use the product at temperatures below 0 ° C;
- start work in the later hours of the morning;
- make sure that the substrate is not frozen.

SUBSTRATE SATURATION WITH WATER

Carry out all the procedures to prepare the substrate then saturate the concrete or masonry with hot water continuously for at least 6 hours before laying **FLUECO 80 T FIBER**. Any excess water on the surface must be removed with compressed air or cloths.

APPLICATION

FLUECO 80 T FIBER can be applied by trowel or spray method. Apply the product on a clean, roughened and water-saturated surface only, as illustrated in the previous paragraph. The finishing time for **FLUECO 80 T FIBER** is approximately half an hour in summer and 1 hour in winter. To prevent micro-cracking due to plastic shrinkage we recommend smoothing the mortar with a wet sponge trowel once it has started setting (approx. 20 min at 20 °C).

OVERLAY UP TO 5CM THICK

No electro welded mesh is needed in case of overlay of max 5 cm thickness. By using a screw-type or piston-type spraying pump, you can apply a single 5cm thick coat even over large surfaces. Clean the pump thoroughly with high pressure water between spraying sessions. In case of a small surface, you can apply **FLUECO 80 T FIBER** by trowel after applying a first and second coat of plaster.

CURING

When PRESIDIO SRA is added to the mix at a dosage of 1 % on the weight of the mortar it acts as internal curing and regulates moisture loss by reducing shrinkage and cracking and enhancing curing. The addition of PRESIDIO SRA to **FLUECO 80 T FIBER** enables correct expansion in air thus reducing shrinkage by 20 - 50 % compared to the use of the product without the additive. To ensure proper curing of the product even in dry climates, or where surfaces are exposed to excessively windy or sunny conditions, we in any case recommend the use of the curing membrane PROBETON CURING N.

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PACKAGING AND STORAGE

FLUECO 80 T FIBER is packaged in 25 kg bags.

If kept in its original packaging and properly stored under cover in a dry place, the product maintains its characteristics for a year.

PRODUCT CHARACTERISTICS

APPEARANCE AND COLOUR	Grey powder
MAXIMUM AGGREGATE SIZE (COMP. A)	2.5 mm
CHLORIDE ION CONTENT (≤0.05%)	≤ 0,05%
PACKAGING	25 kg bag

APPLICATION DATA

MIX COLOR	Grey
MIXING WATER	15-17% of water per 25 kg bag
DENSITY OF MIX - UNI EN 12190	2200 kg/m^3
pH OF MIX	> 12
MIX CONSISTENCY - UNI EN 13395-1	170-180 mm (Tixo)
TEMPERATURE OF USE	+5 ° C to +35 ° C
POT LIFE OF MIX	approx. 60 minutes (20° C - 50% RH)
WAITING TIME BETWEEN COATS	at least approx. 30 minutes (23° C - 50% RH)
THICKNESS OF APPLICATION	5 cm
CONSUMPTION	19 kg/m^2 per cm of thickness

TECHNICAL SPECIFICATIONS

FLUECO 80 T FIBER, produced by **Draco Italiana SpA**, is a two-component, mortar that is shrinkage-compensated and has a low modulus of elasticity for the structural repair and thick lift and surfacing in highly aggressive environments . It shall be be applied in layers up to 4cm thick. The product must be characterised by high adhesion to the substrate, water-tightness and development of high initial and final mechanical strength and comply with the requirements defined in EN 1504-3 for Class R4 structural mortars. All instructions and precautions followed must comply with the recommendations given by the manufacturer: **Draco Italiana SpA**.

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FINAL PERFORMANCE

CHARACTERISTICS	TEST METHOD	REQUIREMENTS IN ACCORDANCE WITH PERFORMANCE EN-1504-3 FOR CLASS R4 MORTARS	PERFORMANCE
COMPRESSIVE STRENGTH	EN 12190	≥45 MPa (after 28 days)	> 20 MPa at 1 day > 50 MPa at 7 days > 70 MPa at 28 days
FLEXURAL STRENGTH	EN 196/1	None	> 7 MPa at 1 day > 9 MPa at 7 days > 10 MPa at 28 days
COMPRESSIVE MODULUS OF ELASTICITY	EN 13412	≥20 GPa (after 28 days)	28 ± 2 GPa
BOND STRENGTH ON CONCRETE (substrate of type MC 0.40 w/c ratio = 0.40) according to EN 1766	EN 1542	≥2 MPa (after 28 days)	> 2 MPa
CONTRASTED EXPANSION IN AIR BOW TEST	UNI 8147 method A	None	1 day: > 0,04 %. (*) Convex arching at 24 hrs
CRACK RESISTANCE	"O Ring test"	no cracks after 180 days (*)	Meets specifications (*)
BENDING TEST (24 h)	linear bar	None	convex arching (*)
RESISTANCE TO ACCELERATED CARBONATION	EN 13295	Depth of carbonation ≤ reference concrete type (MC 0.45 water/cement ratio = 0.45) according to UNI 1766	Meets specifications
IMPERMEABILITY TO WATER -penetration depth-	EN 12390/8	None	< 5 mm
CAPILLARY ABSORPTION	EN 13057	≤ 0.5 kg/m^2 · h$^{0.5}$	< 0.25 kg/m^2·h$^{0.5}$
THERMAL COMPATIBILITY measured as bond strength according to EN 1542 on concrete type MC 0.4 UNI EN 1766:			
- freeze-thaw cycles with de-icing salts	EN 13687/1	≥ 2 MPa (after 50 cycles)	> 2 MPa
- storm cycles:	EN 13687/2	≥ 2 MPa (after 30 cycles)	> 2 MPa
- dry thermal cycles:	EN 13687/4	≥ 2 MPa (after 30 cycles)	> 2 MPa
PPULL-OUT STRENGTH OF STEEL REINFORCING BARS	RILEM-CEB-FIP RC6-78	None	>25 MPa
REACTION TO FIRE	EN 13501 - 1	Euroclass A1	A1

* Specification satisfied with the addition of PRESIDIO SRA to FLUECO 80 T FIBER

NOTE: The performances indicated are obtained with a 170-180 mm consistency according to UNI EN 13395-1

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