

# Betocem Fibre Rapido

**THIXOTROPIC MINERAL MORTAR, RAPID SETTING AND HARDENING, FIBRE-REINFORCED, COMPENSATED SHRINKAGE, WITH LOW ELASTIC MODULUS, FOR RESTORING AND SMOOTHING DEGRADED CONCRETE STRUCTURES, DURABILITY GUARANTEE.**



**TECHNICAL DATA SHEET - REV. 01/2024**

## DESCRIPTION

BETOCEM FIBRE RAPIDO is a quick-setting and hardening powder mortar with compensated shrinkage, consisting of specific high-strength hydraulic binders, siliceous aggregates, special additives and synthetic fibres. When mixed with water, it becomes an excellently workable mortar with a thixotropic effect, which can be applied in great thicknesses, even vertically without risk of dripping. Its special fine composition and rapid hardening (it sets within 30 minutes and can be loaded already after a few hours) allow for easy application, fast finishing and quick re-commissioning of the structure. BETOCEM FIBRE RAPIDO is characterised by excellent adhesion on concrete substrates, provided they have been previously moistened with water. After hardening, BETOCEM FIBRE RAPIDO has high mechanical flexural and compressive strengths, high resistance to carbonation, water impermeability and elastic modulus, thermal expansion coefficient and water vapour permeability coefficient similar to high-quality concrete. Can be used in thicknesses between 10 and 30 mm, in a single coat.

**Complies with European Standard EN 1504-3 ("Non-structural structural repair") for class R4 structural mortars (PCC) according to the CR principle (concrete repair).**

## APPLICATION FIELDS

BETOCEM FIBRE RAPIDO is used for the quick cortical restoration and final smoothing of degraded structural concrete works, both horizontally and vertically, in interventions such as the rapid repair of damaged areas, beam and pillar edges, cornices, balcony frontals and parapets damaged due to oxidation of the rebars, when a mortar with high mechanical performance and ultra-fast setting and hardening is required, the reconstruction of deteriorated iron cover layers of reinforced concrete works and the restoration of motorway, road and railway viaducts. BETOCEM FIBRE RAPIDO can also be used for the rapid levelling of surface defects such as gravel nests or casting joints, diaphragm walls or tunnels, for the sealing of surface cracks, also of cementitious plaster, and for the rapid repair of industrial concrete floors.

## SUBSTRATE PREPARATION

The substrates must be perfectly clean, solid, free of dust and greasy substances and properly roughened. Remove all deteriorated or detached concrete by peening until the substrate is solid, consistent and rough. Previous restoration work, which is not perfectly consistent, must be removed. Thoroughly clean the concrete and rebars using mechanical means (hydro-blasting or brushing), until all oxidation on the bars, surface cement slurry and any other traces of dirt have been removed. In the event of a reduction in the section of the rebars, supplement them with additional rebars. Apply BETOFER 1 K, single-component thixotropic mineral mortar, or BETOFER 2 K, bi-component thixotropic mineral mortar, by brush onto the rebars for their active and passive protection. As soon as the product has completely hardened, wet the area to be restored to saturation with water, eliminating any stagnation when work begins.

## APPLICATION

To prepare the mixture, pour 5 litres of clean water per 25 kg bag of BETOCEM FIBRE RAPIDO into a container or concrete mixer and mix for a about 5 minutes, taking care to remove the part of the powder that is not perfectly dispersed from the sides and bottom of the container, until a homogeneous, lump-free mixture is obtained. Let the mixture rest for a few minutes, remixing briefly before use. This mixture remains workable for about 15 minutes at a temperature of +23°C. Apply BETOCEM FIBRE RAPIDO manually with a trowel or spatula for reconstruction of edges, mouldings and localised interventions, and for reconstruction of deteriorated layers, also vertically without the need for formwork. However, the use of formwork can be useful to speed up horizontal applications, for operations such as beam and column reconstruction. Perfect adhesion with the substrate is ensured by exerting good pressure and reworking the product with the trowel directly on the surface to be restored, wrapping any reinforcing bars, until the desired thickness is reached. If it is necessary to apply a second coat, do so before the previous one has set, but do not wait more than 15-20 minutes between applications. The minimum applicable thickness per layer is approximately 10 mm and a maximum of 30 mm, depending on the application. As soon as the mortar starts to harden, smooth it with a sponge float, metal trowel, plastic or wooden trowel, depending on the degree of finish required. The time required to perform this operation is greatly affected by weather conditions. In addition to BETOCEM (1 K or 2 K) and BETOCEM FIBRE RAPIDO, the complete restoration cycle also includes a decorative protection with MANTOCOLOR anti-carbonation elastomeric water paint.

## YIELD

19 kg/m<sup>2</sup> per cm of thickness.

## RECOMMENDATIONS

- ◆ Do not use BETOCEM FIBRE RAPIDO on smooth concrete substrates, but strongly roughen the surface to be restored.
- ◆ Never remix the product once the setting process has begun, as it will lose all its chemical and physical properties.
- ◆ Cure BETOCEM FIBRE RAPIDO carefully, avoiding, especially on hot or very windy days, rapid evaporation of the mix water that could cause small surface cracks due to plastic shrinkage.
- ◆ Keep the surface moist during the first 24 hours after application of the mortar by spraying it with water or covering it with waterproof sheets.
- ◆ Protect against rain, frost, or direct sunlight for the first 24 hours.
- ◆ Do not work in temperatures below +5°C or above +35°C.
- ◆ Wash all the equipment used for preparing and applying the product with water before it hardens. After setting, the mortar can only be removed mechanically.

## PACKAGING

BETOCEM FIBRE RAPIDO is available in 25 kg polyethylene coated paper bags on 1500 kg pallets. Store the product in a dry place and in its original packaging, well closed. In these conditions its stability lasts at least 12 months.

## SAFETY INSTRUCTIONS

The product contains cement that, in contact with body perspiration, produces an irritant alkaline and sensitising reaction for the skin. Use suitable clothing, gloves and protective glasses. Refer to the respective Safety Data Sheet for more information about how to use the product safely.

## SPECIFICATIONS

Structural restoration of degraded concrete works and rapid protective smoothing by applying thixotropic, quick-setting and hardening, fibre-reinforced, shrinkage-compensated mineral mortar composed of high-strength hydraulic binders, siliceous aggregates, special additives and synthetic fibres, such as **BETOCEM FIBRE RAPIDO** by COLMEF Srl. The product shall meet the minimum requirements of EN 1504-3 for class R4 structural mortars.

The substrates must be clean, solid and compact, suitably roughened after the removal of loose parts and cleaning of oxidised rebars, to be calculated separately. The product must be applied to the substrate wet to saturation, with a trowel in thicknesses of between 10 and 30 mm by hand, respecting a consumption of approximately 19 kg/m<sup>2</sup> per cm of thickness, then a protective rapid skim coat must be made with the same **BETOCEM FIBRE RAPIDO**, to be applied with a sponge float or metal trowel depending on the degree of finish required.

## TECHNICAL DATA

<b>Compliant with Standard:</b>	<b>EN 1504-3</b>
<b>Class:</b>	<b>R4</b>
<b>Typology:</b>	<b>PCC</b>
Appearance:	powder
Colour:	grey
Apparent specific weight (kg/m <sup>3</sup> ):	1700
Particle size (mm):	0-2.5
Mixing ratio:	~ 5 litres of water for 25 kg of powder
Volume mass of the mixture (kg/m <sup>3</sup> ):	2062
Mixture colour:	grey
Mixture consistency:	thixotropic
pH value:	≥ 12
Setting start time:	30 min.
Setting end time:	2-3 h
Setting time between coats:	max. 15-20 min.
Waiting time for overpainting:	24-48 h
Allowed application temperature:	from +5 °C to +35 °C

## FINAL PERFORMANCE according to EN 1504-3 Class R4-PCC

	<b>Requirements</b>	<b>Results</b>	<b>Test method</b>
Compressive strength after 28 days (MPa):	≥ 45	> 53,3	EN 12190
Flexural strength after 28 days (MPa):	not required	> 10,1	EN 12190
Chloride ion content (%):	≤ 0.05	< 0,006	EN 1015-17
Direct Tensile Adhesion (MPa):	≥ 2.0	> 2.0	EN 1542
Resistance to carbonation:	$d_k \leq \text{control cls [MC(0.45)]}$	Pass	EN 13295
Elastic modulus in compression (GPa):	≥ 20	> 22,4	EN 13412
Thermal compatibility measured as adhesion according to EN 1542 - Bond strength after 50 cycles (MPa):			
- freeze-thaw cycles:	≥ 2.0	> 2.0	EN 13687-1
- storm cycles:	≥ 2.0	> 2.0	
- dry thermal cycles:	≥ 2.0	> 2.0	
Capillary absorption (kg/m <sup>2</sup> ·h <sup>0.5</sup> ):	≤ 0.5	< 0,31	EN 13057
Reaction to fire:	Euroclass	Class A1	EN 13501-1

DATA COLLECTION AT +23 °C - R.H. 50% AND NO VENTILATION

The above information and prescriptions are based on our best experience. However, we cannot accept any liability for the possible misuse of the products. We therefore advise those who intend to use them to assess whether or not they are suitable for the intended use and to carry out preliminary tests in any case. Always refer to the latest version of the technical data sheet, available at [www.colmef.com](http://www.colmef.com).

**FOR MORE INFORMATION OR PARTICULAR USES, PLEASE CONSULT THE COLMEF TECHNICAL SUPPORT SERVICE.**

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