



COLMEF
BUILDING BETTER

Betocem Fibre

THIXOTROPIC, FIBRE-REINFORCED, SHRINKAGE-COMPENSATED MINERAL MORTAR WITH A LOW MODULUS OF ELASTICITY FOR THE GUARANTEED DURABILITY REHABILITATION OF DEGRADED CONCRETE STRUCTURES.



TECHNICAL DATA SHEET - REV. 01/2023

DESCRIPTION

BETOCCEM FIBRE is a powder mortar, with compensated shrinkage, composed of high-strength hydraulic binders, siliceous aggregates, special additives and synthetic fibres. When mixed with water, it becomes a mortar of excellent workability with a thixotropic effect, which can be applied in large thicknesses, even vertically without the risk of dripping and without the need for formwork. BETOCCEM FIBRE adheres perfectly to old concrete substrates, provided they have been previously wetted with water, and, once hardened, has average mechanical resistance to bending and compression, impermeability to water and elastic modulus, thermal expansion coefficient and water vapour permeability coefficient similar to excellent quality concrete.

Can be used in thicknesses between 10 and 30 mm, in a single coat.

Conforms to European Standard EN 1504-3 ("Non-structural structural repair") for class R3 structural mortars (PCC) according to the CR principle (concrete repair).

FIELDS OF APPLICATION

BETOCCEM FIBRE is used for repairing horizontally and vertically degraded concrete structures, for repairing damaged areas such as beam and pillar edges, cornices, balcony fronts and parapets damaged by oxidation of reinforcing bars, and for reconstructing damaged iron cover layers of reinforced concrete structures. BETOCCEM FIBRE can also be used for regularising diaphragm walls or tunnels, for regularising surface defects such as gravel nests or casting joints, and for filling rigid joints.

SUPPORT PREPARATION

Substrates must be perfectly clean, solid, free of dust and greasy substances and suitably roughened. Remove all degraded or detached concrete by peening until the substrate is solid, consistent and rough. Previous restoration work, which is not perfectly consistent, must be removed. Carefully clean the concrete and reinforcement rods using mechanical means (hydro-blasting or brushing), until all oxidation on the rods, surface cement slurry and any other traces of dirt have been removed. If the section of the reinforcement bars is reduced, supplement them with additional bars. Apply BETOFER 1 K, single-component thixotropic mineral mortar or BETOFER 2 K, two-component thixotropic mineral mortar to the reinforcement rods by brush for active and passive protection of the reinforcement rods. 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 mix, pour approx. 4.5 litres of clean water per 25 kg bag of BETOCCEM FIBRE into a container or concrete mixer and mix for approx. 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 mix is obtained. Let it rest for a few minutes, stirring it briefly before use. This mixture remains workable for approx. 1 hour at a temperature of +23 °C.

Apply BETOCEM FIBRE manually with a trowel or spatula for reconstruction of edges, mouldings and localised interventions, even vertically without the need for formwork. The use of formwork can however be useful to speed up horizontal applications, for interventions such as reconstruction of beams and pillars. Perfect adhesion with the substrate is guaranteed 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. BETOCEM FIBRE can also be applied by spraying with a suitable piston or auger plastering machine for large-scale cortical restoration work. If it is necessary to apply a second coat, do so before the previous one has finished setting, but do not wait more than 4 hours between applications. The minimum applicable thickness per coat is approximately 10 mm and maximum 30 mm, depending on the application. It is advisable to always leave the last layer of BETOCEM FIBRE applied roughened to ensure perfect adhesion of the subsequent protective skim coat. In addition to BETOCEM FIBRE (1 K or 2 K) and BETOCEM FIBRE, the complete renovation cycle includes a flexible skim coat to be made with BETOCEM FINITURA and decorative protection to be made with MANTOCOLOR anti-carbonating elastomeric water paint.

YIELD

19 kg/m² per cm of thickness.

RECOMMENDATIONS

- ◆ Do not use BETOCEM FIBRE 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-physical properties.
- ◆ Cure BETOCEM FIBRE carefully, avoiding, especially on hot or very windy days, the rapid evaporation of mixing water that could cause small surface cracks due to plastic shrinkage.
- ◆ Keep the surface moist during the first 24 hours after applying the mortar, spraying it with water or covering it with waterproof sheets.
- ◆ Protect from rain, frost or beating sun for the first 24 hours.
- ◆ Do not work at temperatures below +5 °C or above +35 °C.
- ◆ Wash all equipment used for preparation and application of the product with water before it hardens. After setting, the mortar may only be removed mechanically.

PACKAGING

BETOCEM FIBRE is supplied in 25 kg polythene paper bags on 1500 kg pallets. Store the product in a dry place and in its original tightly closed packaging. Under these conditions its stability is at least 12 months.

SAFETY INSTRUCTIONS

The product contains cement, which on contact with body sweat produces an alkaline reaction irritating and sensitising to the skin. Wear suitable clothing, gloves and protective goggles.

For more information on the safe use of the product, see the relevant Material Safety Data Sheet.

SPECIFICATIONS

Volumetric reconstruction and structural repair of degraded concrete works by applying thixotropic, fibre-reinforced, compensated-shrinkage mineral mortar with a low modulus of elasticity, composed of high-strength hydraulic binders, siliceous aggregates, special additives and synthetic fibres, such as **BETOCEM FIBRE** by COLMEF Srl. The product must meet the minimum requirements of Standard EN 1504-3 for class R3 structural mortars.

The substrates must be clean, solid and compact, suitably roughened after removal of loose parts and cleaning of oxidised reinforcement rods, to be calculated separately. The mortar must be applied to the substrate wet to saturation, with a trowel or spatula in thicknesses of between 10 and 30 mm per coat, respecting a consumption of approximately 19 kg/m² per cm of thickness.

TECHNICAL DATA

Conforms to Standard:	EN 1504-3
Class:	R3
Type:	PCC
Form:	powder
Colour:	grigio
Apparent specific weight (kg/m ³):	1240
Mixing ratio:	~ 4,5 litres of water per 25 kg of powder
Mixing density (kg/m ³):	1720
Mix colour:	grey
Mixing consistency:	thixotropic
pH value:	≥ 12
Starting time for setting:	1,5 h
End of setting time:	4 h
Waiting time between coats:	max. 4 h
Waiting time for overcoating:	48 h
Surface drying time at +23 °C:	30 min.
Permissible application temperature:	+5 °C to +35 °C

FINAL PERFORMANCE according to EN 1504-3 Class R3-PCC

	Requirements	Results	Test method
Compressive strength after 28 days (MPa):	≥ 25	> 36,6	EN 12190
Flexural strength after 28 days (MPa):	not required	> 8,2	EN 12190
Chloride ion content (%):	≤ 0,05	< 0,01	EN 1015-17
Direct tensile adhesion (MPa):	≥ 1,5	> 1,5	EN 1542
Resistance to carbonation:	dk ≤ control concrete [MC(0,45)]	Passes	EN 13295
Elastic modulus in compression (GPa):	≥ 15	> 18,2	EN 13412
Thermal compatibility measured as adhesion to EN 1542 - Bond strength after 50 cycles (MPa):			
- freeze-thaw cycles:	≥ 1,5	> 1,5	EN 13687-1
- thunderstorm cycles:	≥ 1,5	> 1,5	
- thermal dry cycles:	≥ 1,5	> 1,5	
Capillary absorption (kg/m ² ·h ^{0,5}):	≤ 0,5	< 0,14	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.

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

COLMEF SRL | Z.I. Ponte d'Assi | 06024 - Gubbio (PG) ITALY | Tel. +39 075923561 | info@colmef.com | www.colmef.com