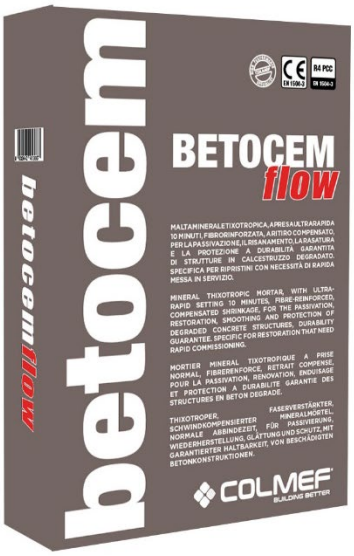
Betocem Flow

POURABLE, FIBRE-REINFORCED, SHRINKAGE COMPENSATED MINERAL MORTAR WITH A LOW MODULUS OF ELASTICITY FOR THE REHABILITATION AND STRUCTURAL CONSOLIDATION OF DEGRADED CONCRETE STRUCTURES WITH GUARANTEED DURABILITY BY MEANS OF SUITABLE FORMWORK.



TECHNICAL DATA SHEET – REV. 01/2024

DESCRIPTION

BETOCEM FLOW is a powder mortar, with compensated shrinkage, composed of high-strength cement binders, selected aggregates and special additives. When mixed with water, it turns into a mortar with excellent fluidity and flowability, high adhesion on concrete substrates, suitable for application by pouring into formworks without the risk of segregation, even in great thicknesses. Once hardened, BETOCEM FLOW has high mechanical resistance to bending and compression, water impermeability and elastic modulus, thermal expansion coefficient and water vapour permeability coefficient similar to high quality concrete.
Can be used in thicknesses up to 60 mm.

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

FIELDS OF APPLICATION

BETOCEM FLOW is used for the restoration of degraded concrete works that require the use of pourable mortars due to thicknesses or particular degradation conformations, such as in the structural reintegration of reinforced concrete pillars and beams (by means of collaborating castings) or slabs following the removal of deteriorated parts. BETOCEM FLOW is ideal for the rigid filling of joints in civil and industrial prefabrication, for the reinstatement of road, airport and industrial concrete floors, for the reinstatement of hydraulic works, such as canals or dams, and for the anchoring of both machinery and metal structures by underplate pouring.

SUPPORT PREPARATION

Substrates must be perfectly clean, solid, free of dust, greasy substances and suitably roughened. Remove all deteriorated or detached concrete, down to the solid, consistent and rough substrate. Previous restoration work that is not perfectly consistent must be removed. Carefully clean the concrete and reinforcement rods until all oxide on the reinforcement 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 4.5 litres of clean water for each 25 kg bag of BETOCEM FLOW into a container or concrete mixer and mix for 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 mix is obtained. Allow the resulting mixture to rest for a few minutes, stirring it briefly before use. This dough remains workable for about 1 hour at a temperature of +23 °C.
Pour the BETOCEM FLOW slurry into the formwork in a continuous flow, taking care not to entrap air or otherwise allow it to escape. The formwork must not absorb water from the mortar mix, so it is advisable to treat it beforehand with a suitable release agent. Once the casting has been completed, it will not be necessary to vibrate it with mechanical vibrators. Always check that the filling of the degraded parts has reached even the most difficult to access areas, such as narrow spaces or underplates; in particularly difficult areas it may be useful to help with wooden battens or iron rods in order to facilitate perfect filling. The maximum thickness that can be applied with BETOCEM FLOW is approx. 60 mm; for greater thicknesses, the addition of aggregates of a suitable grain size in the amount of 30 % of the product weight is indispensable. Coatings of BETOCEM FLOW thicker than 4 cm, in the absence of confinement, should only be carried out after placing contrasting reinforcement bars, taking care to apply an iron cover of at least 2 cm. If it is necessary to apply subsequent coats of BETOCEM FLOW, it is advisable to leave the surface of the last layer applied rough and to saturate the substrate. In addition to BETOFER (1 K or 2 K) and BETOCEM FLOW, the complete renovation cycle also includes a decorative protection coat to be applied with anti-carbonation elastomeric water paint.

YIELD

19 kg/m^2 per cm of thickness.

RECOMMENDATIONS

- Do not use BETOCEM FLOW for spray or trowel applications, as it is not a thixotropic mortar.
- Do not use BETOCEM FLOW on smooth concrete substrates, but strongly roughen the surface to be restored.
- Cure BETOCEM FLOW thoroughly avoiding, especially on hot or very windy days, rapid evaporation of the mixing water which 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.

PACKING

BETOCEM FLOW 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

Il prodotto contiene cemento che a contatto con il sudore del corpo produce una reazione alcalina irritante e sensibilizzante per la pelle. Usare indumenti adatti, guanti e occhiali protettivi.
Per maggiori informazioni per un impiego sicuro del prodotto, consultare la relativa Scheda Dati di Sicurezza.

SPECIFICATIONS

Renovation and structural consolidation of deteriorated concrete works by pouring pourable, fibre-reinforced, shrinkage-compensated mineral mortar with a low modulus of elasticity, composed of high-strength hydraulic binders, siliceous aggregates and special additives, such as **BETOCEM FLOW** by COLMEF Srl. The product must meet the minimum requirements of Standard EN 1504-3 for class R4 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 in thicknesses of no more than 60 mm, with a consumption of approximately 19 kg/m^2 per cm of thickness.

TECHNICAL DATA

Conforms to Standard:	**EN 1504-3**
Class:	**R4**
Typology:	**PCC**
Form:	powder
Colour:	grey
Apparent specific weight (kg/m3):	1300
Mixing ratio:	~ 4.5 litres of water per 25 kg of powder
Mixing density (kg/m^3):	2267
Colour of the mixture:	grey
Consistency of the mixture:	pourable
pH value:	12-13
Setting start time:	1,5 h
End of setting time:	3-3,5 h
Permissible application temperature:	+5 °C to +35 °C

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

	Requirements	**Results**	**Text method**
Compressive strength after 28 days (MPa)	≥ 45	> 78,3	EN 12190
Flexural strength after 28 days (MPa):	not required	> 10,4	EN 12190
Chloride ion content (%):	≤ 0,05	< 0,02	EN 1015-17
Direct tensile adhesion (MPa):	≥ 2,0	> 2,0	EN 1542
Carbonation resistance:	dk ≤ control cls [MC(0.45)]	Passes	EN 13295
Elastic modulus in compression (GPa):	≥ 20	> 29,2	EN 13412
Thermal compatibility measured as adhesion according to EN 1542 - Bond strength after 50 cycles (MPa): - freeze-thaw cycles: - thunderstorm cycles: - dry thermal cycles:	 ≥ 2,0 ≥ 2,0 ≥ 2,0	 > 2,0 > 2,0 > 2,0	EN 13687-1
Capillary absorption (kg/$m^2 \cdot h^{0.5}$):	≤ 0,5	< 0,08	EN 13057
Reaction to fire:	Euroclass	Class A1	EN 13501-1

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

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