

# Torggler

## Concrete Restoration

# COLABILE

Premixed, high-strength, fibre-reinforced mortar, UNI EN 1504-3 PCC type and R4 class, applicable by casting in formwork for the reconstruction of structural components.



- High mechanical strength
- Excellent rheological properties
- Anti shrinkage
- Anti bleeding and anti sedimentation



## APPLICATION AREAS

Colabile is ideal in construction engineering for repairing damaged beams, columns and string courses, where casting in formwork is recommended. It can be used to good advantage to repair thick fronts, ledges and parapets by casting in formwork and for volume restoration of damaged floor slabs and decking. It can also be used for anchorage and placement of lightweight structures and machinery, taking into account the time taken to develop the mechanical strength required to support the structure or machine under working conditions. Using the UNI EN 1504-9 classification, Colabile is suitable for Repair Principle 3 (Concrete Restoration), Repair Principle 4 (Structural Strengthening) and Repair Principle 7 (Preserving or restoring passivity) applications using Method 3.1 (Applying mortar by hand), Method 4.4 (Adding mortar or concrete) and Method 7.1 (Increasing cover to reinforcement with additional cementitious mortar or concrete).

## FEATURES

Colabile is a ready-to-use, fiber-reinforced, gray-colored mortar based on high-strength special cements, selected aggregates and special additives. Its self-levelling power makes it possible to carry out repairs and volumetric reinstatements in large thicknesses by pouring into formworks, achieving perfect and fast filling

without the need for vibration. A slight expansion in both the plastic and post-hardening phases makes it possible to compensate for shrinkage by ensuring perfect plugging of every interstice with considerable improvement in final adhesion characteristics, while avoiding cracking. The mortar, although fluid, is cohesive and does not undergo phenomena of component separation. It guarantees high mechanical properties with particular reference to flexural strength, an important parameter for workmanlike repairs of reinforced concrete. Colabile is a structural repair product for concrete structures by means of hydraulic mortar of type PCC and class R4 according to EN 1504-3, in addition Colabile is a mortar with excellent resistance to penetration of chloride ions, determined according to EN 13396.

## **WARNINGS**

- To avoid cracking caused by excessively rapid evaporation of the water in the mixture in hot weather and to promote expansion to compensate for shrinkage, the surface of Colabile castings and repairs must be kept wet for at least 48 hours and must be protected from wind and direct sunlight.
- For surface finishing details, general rules of good practice in the application of cementitious mortars apply.
- As with all cement-based products, do not apply at temperatures below +5 °C.

## **INSTRUCTIONS FOR USE**

### **Preparation**

The substrate must be clean and well keyed. Hammer and scrape the substrate to remove all loose, crumbling or non-cohesive material until a clean, resistant surface is revealed. Remove all traces of carbonated concrete from the reinforcement. Clean thoroughly using a dry or wet sand blaster to expose the bare metal. To protect against rust and corrosion, apply Restauero Ferri on the reinforcement. The day before casting, wet the substrate until the water stops soaking in.

### **Mixing the product**

Mix Colabile with approximately 14 to 16% water (about 3.5 to 4.0 litres per 25 kg bag) depending on the consistency required. Do not use more than 4 litres for 25 kg of product. Pour approximately 3/4 of the total amount of water in the cement mixer and, while the mixer is moving, add the dry premixed mortar, pouring it in uniformly and continuously. Mix until smooth and free of lumps. Then add the rest of the water until you obtain the required consistency. For small quantities, a mechanical stirrer (low-speed drill with mixer attachment) may also be used, following the same procedure. Whatever the type of mixer used, avoid incorporating an excessive amount of air in the mixture. Very small quantities may be mixed by hand using a bucket and trowel. In this case, more water may be needed in proportion and the end quality may not be as good in terms of mechanical properties (shrinkage and risk of cracking).

### **Application**

The mixture prepared in this way has a pot life of about 30 minutes under normal conditions (+20 °C). Higher temperatures reduce pot life. Wet the surface again until it is saturated and let the excess water evaporate or remove it with a sponge. Pour the mixture into the forms smoothly and from one side only so that the air can escape from the other side. Use iron rods or bars to help fill in narrow gaps or crevices. Vibrating is not necessary. For thicknesses greater than 2 cm, the mortar must be reinforced with galvanized mesh and this must have a cover of at least 1 cm. For final layers more than 4 cm thick, electro-welded mesh may also be used. For layers 1 to 2 cm thick, reinforcement mesh is not necessary but the substrate must be well keyed so as to counter expansion. For cavities larger than 3-4 cm, dilute Colabile up to a maximum of 50% by weight of fine gravel (3-7 mm) i.e. 2 parts Colabile to 1 part fine gravel. In practical terms this means approximately 3 buckets of fine gravel for every 100 kg (equal to four 25 kg bags) of Colabile. This changes some of the characteristics of the product such as the amount of water required for the mix which is reduced from approximately 14% of the product to approximately 10% of the product when diluted with gravel. Mechanical performance in terms of compression resistance is reduced by approximately 5% to somewhere in the order of 60 MPa. Pourable can also be pumped with suitable piston or worm plastering machine such as Turbosol or Putzmeister, excluding continuous mixing machines.

### **Cleaning**

The tools used for laying can be cleaned with water before the mortar hardens; afterwards cleaning can be carried out only by mechanical removal.

## TECHNICAL SPECIFICATIONS

PARAMETER AND METHOD	REQUIREMENT EN 1504-3	VALUE
<b>MEASURED ON POWDER PRODUCT</b>		
Consistence		Powder
Colour		grey
Bulk density MIT 13 (*)		1.400 kg/m <sup>3</sup>
Granulometry (EN 12192-1)		0-2,5 mm
Water soluble chlorides (EN 1015-17)	≤ 0,05%	< 0,01%
<b>MEASURED ON FRESH MIX</b>		
Mixing water		14-16%
Density of fresh mix (EN 1015-6)		2,200 kg/m <sup>3</sup>
Mix consistency		Fluid and pourable
Setting time: start (EN 196-3)		approx. 6 ore
Setting time: finish (EN 196-3)		approx. 8 ore
Mix pot life (EN 13395)		> 30 min
Free expansion in plastic stage (UNI 8996)		0,80 %
Contrasted expansion at 24 hours (UNI 8147)		0,006 %
Contrasted expansion at 28 days (UNI 8147)		0,017 %
Application temperature		from +5 °C to +30 °C
<b>MEASURED ON HARDENED PRODUCT</b>		
Operating temperature		from -20 °C to +90 °C
Compressive strength at 1 day (EN 12190)		approx. 23 MPa
Compressive strength at 7 day (EN 12190)		approx. 50 MPa
Compressive strength at 28 day (EN 12190)	≥ 45 MPa	approx. 60 MPa
Flexing strength at 1 day (EN 12190)		approx. 5 MPa
Flexing strength at 7 day (EN 12190)		approx. 7 MPa
Flexing strength at 28 days (EN 12190)		approx. 10 MPa
Compression modulus of elasticity (EN 13412)	≥ 20 GPa	approx. 25 GPa
Adhesion by pull-off test (EN 1542)	≥ 2,0 MPa	approx. 2,7 MPa
Carbonation resistance (EN 13295)	dk ≤ control concrete	dk = 0 mm (no CO <sub>2</sub> penetration)
Penetration of chloride ions (EN 13396)	Penetration values after 28 days	< 4 mm
	Penetration values after 3 months	< 8 mm
	Penetration values after 6 months	< 8 mm

Impeded shrinkage/expansion (EN 12617-4)	Bond strength after test: $\geq 2,0$ MPa	approx. 3,0 MPa
Thermal compatibility (freezing-thawing cycles) (EN 13687-4)	Bond strength after 50 cycles: $\geq 2,0$ MPa	approx. 2,5 MPa
Capillary absorption (EN 13057)	$\leq 0,5 \text{ kg}/(\text{m}^2 \cdot \text{h}^{0,5})$	approx. $0,3 \text{ kg}/(\text{m}^2 \cdot \text{h}^{0,5})$
Reaction to fire (EN 13501-1)	Value declared by the producer	Class A1
Product classification (EN 1504-3)		R4 PCC

1 MPa is equal to 1 N/mm<sup>2</sup>\* Torggler's Internal Methods (MIT) are available on request.

Color	Grey
Packaging	bag
Packaging size	25 kg
Pallet	50 bags

## CONSUMPTION

Consumption is approximately 2000 kg/m<sup>3</sup>.

## STORAGE

Colabilev must be stored in a dry, protected place. Unopened in its original bags, the product can be stored for at least 12 months.

## CERTIFICATIONS

Product tested and classified as R4 PCC as per UNI EN 1504-3. The EC Declaration of Conformity and the related official test certificates are available on request.

Additional certifications and tests conducted:

- The product can be applied for exposures XC 1-4, XF 1-4, XW 1-2, XD 1-3, XS 1-3, XM 1, XA 1-2 and X0 according to EN 13396 "Products and systems for the protection and repair of concrete structures – Test methods – Measurement of chloride ion penetration."
- High resistance to freezing-thawing salts – detection by CDF method
- High resistance to chloride penetration – detection by chloride migration coefficient test (test according to EN 13396)
- Complies with water resistance under pressure according to DIN 12390-8
- Factory production verifications according to DIN EN 1504-3
- Company certification according to DIN EN ISO 9001: 2015
- Meets the requirements of building material class A1 (non-combustible) according to European Commission Decision 2000/605 / EG of September 26, 2000 (published in the Official Journal L258)
- Cements: according to DIN EN 197-1
- Aggregates: according to DIN EN 12620

The information contained in this document is reported on the basis of our experience and knowledge; therefore, any recommendations and suggestions made are without any guarantee and must be verified before using the product by those who intend to use it, who assume all responsibility that may result from its use since the conditions of use are not under our direct control. In case of doubt, it is always advisable to make preliminary tests and/or ask for the intervention of our technicians. Torggler reserves the right to modify, replace and/or delete the items, as well as to change the product data in this document without prior notice; in this case the indications given here may no longer be valid. Always refer to the latest version of the data sheet, available at [www.torggler.com](http://www.torggler.com). Version 17.11.2021.