

Torggler

Concrete Restoration

RESTAURO R4

Premixed, single-component, anti-shrinkage, normal setting, pre-mixed mortar for concrete and reinforced concrete reconstruction and protection, PCC type and class R4 according to EN 1504-3.



- High mechanical strength
- Excellent thixotropy
- Anti-shrinkage
- Applicable in thickness between 10 and 40 mm



APPLICATION AREAS

RestauRO R4 is indicated for:

- Structural plasters;
- Reconstruction of the concrete cover;
- Rebuilding of reinforced concrete elements.

In accordance with EN 1504-9, the fields of application of RestauRO R4 referred to in Principle 3 (Concrete Restoration), 4 (Structural Consolidation) and 7 (Preservation or Restoration of Passivity) by means of Methods 3.1, 3.2 and 3.3 (Application of Mortar by Hand), 4.4 (Addition of Mortar or Concrete) and 7.1 and 7.2 (Increase of concrete cover by Addition of Cement Mortar or Concrete).

MAXIMUM ATTAINABLE THICKNESSES

- Minimum thickness: approx. 1 cm.
- Maximum overall thickness: approx. 8 cm.
- Maximum thickness each coat: approx. 4 cm.

For overall thickness values greater than 2 cm, the covering must be reinforced with galvanised mesh which must be protected with at least 1 cm of concrete cover. Electrowelded mesh can also be used for overall thickness greater than 4 cm.

FEATURES

Restauro R4 is a ready-to-use, fibre-reinforced mortar for vertical or ceiling application without the need for formwork, slightly expansive both in the plastic and post-hardening phases to counteract the formation of cracks. It is easy to apply either by hand or by spray with a suitable pump, even in layers of several centimetres without any signs of dripping. It guarantees high mechanical characteristics with particular reference to flexural strength, an important parameter for professional repairs of reinforced concrete. Restauro R4 is a product for the structural repair of concrete structures by means of hydraulic mortar of PCC type and class R4 according to EN 1504-3.

WARNINGS

- To prevent cracks from forming in the plastic mortar due to too rapid evaporation of the mixing water and to ensure that the expansive action which cancels the effects of mortar shrinkage is carried out, the fillings and repairs carried out with Strutturale must be kept damp for at least 2 days by spraying the surface with nebulised water.
- For installation details (e.g. execution of edges, surface finishes), the rules of good engineering and precautions for the application of cement mortars must be observed.
- As with all cement-based products, never carry out work and applications at temperatures below +5 °C.

INSTRUCTIONS FOR USE

Preparation for use

The application surfaces must be clean and and severely roughened. Remove cement residues and loose, crumbling, inconsistent parts until the sound, durable substrate is reached. Remove rust from the iron bars. If the section of the bars is weakened, supplement them with additional iron bars. Wash with a pressurized water jet. Apply water on the substrate until it is rejected. In the event of water seepage or water penetration, block these with quick-setting or very quick-setting mortars such as Umafix and Stop. For an effective adhesion on the substrate and/or corrosion protection of the reinforcement, apply Restauro Ferri (see the relative technical data sheet).

Instructions for application

Mix Restauro R4 with about 15-17% of water (equal to 3.75-4.25 litres of water per 25 kg bag) and stir for a few minutes until the mixture is homogeneous and free of lumps. Apply the mortar by hand with a masonry trowel or American trowel or by spraying with a suitable plastering machine. In the summer season, mix Restauro R4 with cold water and apply it away from the sun or protect it adequately from the direct sunlight. In places particularly exposed to ventilation and sunlight, mix Restauro R4 with 1:4 diluted Neoplast Latex – water solution and protect the applied mixture. For better adhesion of the fillings, it is advisable to spread on the substrate an adhesion grout made of Restauro R4 mixed with Neoplast Latex diluted in water 1:2 working fresh on the fresh substrate (see Neoplast Latex technical data sheet). Restauro R4 can also be applied by spraying with a suitable piston or worm plastering machine such as Turbosol or Putzmeister, with the exception of 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	VALUE	REQUEST EN 1504-3
POWDER PRODUCT VARIATION		
Consistency	Powder	
Bulk density (MIT 13*)	1400 kg/m ³	
Particle size (EN 12192-1)	0-3 mm	

Water-soluble chlorides (EN 1015-17)	≤ 0.05%	≤ 0.05%
FRESH MIXTURE VARIATION		
Mixing water	15 – 17 % (3.75-4.25 litres of water per 25 kg)	
Mixture density (EN 1015-6)	2190 kg/m ³	
Mixture consistency	thixotropic	
Setting times (EN 196-3) setting start	approx. 4 hours	
Setting times (EN 196-3) setting end	approx. 5 hours	
Mixture workability time (EN 13395)	approx. 50 min	
Application temperature	from +5 °C to +30 °C	
Consumption	approx. 19 kg/m ² each cm of thickness	
HARDENED PRODUCT VARIATION		
Operating temperature:	from -20 °C to +90 °C	
Flexural strength (EN 12190) after 28 days	9 MPa	
Compressive strength (EN 12190) after 28 days	60 MPa	≥ 45 MPa
Compressive modulus of elasticity (EN 13412)	24 GPa	≥ 20 GPa
Adhesion bonding (EN 1542)	2.5 MPa	≥ 2.0 MPa
Resistance to carbonation (EN 13295)	Specification passed	d _k ≤ control concrete
Shrinkage/expansion prevented (EN 12617-4)	2.4 MPa	Bond strength after testing: ≥ 2.0 MPa
Thermal compatibility (freeze-thaw) (EN 13687-1)	2.1 MPa	Bond strength after 50 cycles: ≥ 2.0 MPa
Capillary absorption (EN 106213057)	0.1 kg/m ² h ^{0.5}	≤ 0.5 kg/(m ² •h ^{0.5})
Reaction to fire (EN 13501-1)	Class A1	Manufacturer's declared value
Product classification (EN 1504-3)	R4 PCC	

1 MPa equals 1 N/mm²* Torggler's Internal Methods (MIT) are available on request.

Color	Grey
Packaging	bag
Packaging size	25 kg
Pallet	50 bags

CONSUMPTION

The consumption of Resaturo R4 is approx. 19 kg/m² each cm of thickness.

STORAGE

Restauro R4 must be stored in a dry and sheltered place. In the original closed bags it is kept for at least 12 months. **PROTECT FROM HUMIDITY.**

CERTIFICATIONS

Product classified R4 PCC according to EN 1504-3.

Additional certifications and tests performed:

- 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 ingress".
- High resistance to freeze-thaw 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 checks 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 26 September 2000 (published in the Official Journal L258)
- Cements: according to DIN EN 197-1
- Aggregates: according to DIN EN 12620

Legend of classification according to EN 1504-3

CC	Hydraulic mortars and hydraulic concretes
PCC	Polymer hydraulic cement mortars or concretes
PC	Polymer binder-based mortar or concrete with calibrated aggregates
P	Reactive polymer binders
R1	Non-structural mortars with compressive strength \geq 10 MPa
R2	Non-structural mortars with compressive strength \geq 15 MPa
R3	Structural mortars with compressive strength \geq 25 MPa
R4	Structural mortars with compressive strength \geq 45 MPa

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. Version 04.02.2021.