

Torggler

Concrete Restoration

RESTAURO R2

Premixed fast setting thixotropic mortar, uni en 1504-3 pcc type and r2 class, resin-bonded and fibre-reinforced, for reconstruction of concrete.



- Exceptional workability
- Excellent thixotropy
- Excellent mechanical strength
- Applicable in layers 10 to 60 mm thick
- Semi-rapid product
- Low modulus of elasticity



APPLICATION AREAS

- Cortical restoration and reconstruction of cover of concrete and reinforced concrete elements such as beams, columns, septa, floors
- Reconstruction of balcony pediments, cornices, and stringcourses.
- Repair of concrete castings, screeds, precast and noncast elements such as channels, diaphragms, tunnels.
- Regularization of gravel nests, formwork spacer holes, joint shells.
- Consolidation and reinforcement of masonry.

TYPES OF SUBSTRATE

- Concrete and reinforced concrete
- Cementitious mortars and substrates with good mechanical strength

MAXIMUM ATTAINABLE THICKNESSES

Applicable in thicknesses from 10 mm to 40 mm and, in limited extension situations, even up to 60 mm per coat. Maximum total thicknesses achievable: 80-100 mm.

FEATURES

Restauro R2 is a rapid, ready-for-use, fibre-reinforced, grey-coloured mortar which is based on special cements, selected aggregate, synthetic resins and special additives. Its high thixotropic nature makes it possible to use the mortar for vertical or ceiling applications, both manually and sprayed with a pump, without leaving sag marks. A slight expansion both in the plastic stage and in the post-hardening stage makes it possible to compensate for shrinkage with considerable improvement in the final adhesion and at the same time avoiding the formation of cracks. The high level of water retention reduces the danger of "burns" when applying thin coats (which, however, must be no less than 1 cm) and during critical climatic conditions (high temperatures and strong winds). In this case, suitable precautions must be taken (avoid direct exposure to the sun, mix with cold 1/4 water, apply the product in the cooler hours of the day when it is not too sunny, etc.). Restoration R2 and particularly suitable for rebuilding balcony pediments, steps, parapets, and for reconstructing the concrete cover in concrete structures degraded by carbonation phenomena or other types of deterioration, provided that the structures have not suffered structural failure (in this case use Structural). It can also be advantageously used to regularize defects in reinforced concrete castings, such as gravel nests of a certain consistency and incorrect positioning of reinforcing bars resulting in their surfacing, provided that such regularizations have the thickness of at least 1 cm. According to EN 1504-9, the scope of Restoration R2 is referable to Principles 3 (Concrete Restoration) and 7 (Preservation and Restoration of Passivity). Restauro R2 is a UNI EN 1504-3 R2 class PCC type hydraulic mortar designed for the non-structural repair of concrete.

WARNINGS

- Never mix with other binders such as cement, hydraulic lime, gypsum, etc.
- Do not add water when the mix has already started setting.
- To avoid the formation of cracks in the plastic mortar due to the too rapid evaporation of the mixing water in hot weather, and for the expansive action that cancels the effects of mortar shrinkage to take place, restorations and repairs made with Restauro R2 must be kept moist for at least 48 hours and protected from wind and direct sunlight.
- Do not apply the product at temperatures below +5 °C and above +30 °C.
- Avoid applications less than 1 cm thick, so do not perform "zero" shaving.
- The maximum total thickness is about 10 cm.
- The maximum thickness per coat is about 4-6 cm. For overall thicknesses greater than 3 cm, if the area involved in the intervention is extensive, the carryover must be reinforced with galvanized mesh and this must be protected with at least 1 cm of iron cover. If the total thicknesses are greater than 4 cm, electrowelded mesh can also be used. For localized interventions, e.g. small corners and edges, or restorations on limited surfaces, as well as for thicknesses of less than 3 cm, the use of a reinforcing mesh is not necessary, but in any case the substrate must be strongly roughened to counter expansion. In cases that allow it confine the carryover by means of formwork in order to better counteract the expansive action of the mortar.
- In the case of multiple-coat applications, apply the next coat before the previous one has finished setting, i.e., do not wait more than 90 minutes at +20 °C.
- For laying details (e.g., execution of edges and surface finishes) observe the standards of good technique and the precautions adopted in the application of cement mortars.

INSTRUCTIONS FOR USE

Preparation

The background must be clean and highly keyed. Hammer and scrape to remove any loose, disintegrated or damaged parts, until the resistant and clean background is revealed. Clear the protruding reinforcement bars by completely freeing them from the carbonated concrete and sandblast them until they are bare using a hydro-sandblaster or a normal sandblaster. Wet the background thoroughly and let the excess water evaporate or remove it with a sponge. For effective anti-corrosion protection, apply Restauro Ferri to the reinforcement bars and let it harden so that the subsequent applications do not damage the protective layer.

Mixing the product

Then prepare an Restauro R2 based rendering coat mixed with a 1:2 solution of Neoplast Latex and water to form a fluid and apply it to the background prepared as described above. Mix Restauro R2 with approximately 17 – 19% water (approx. 4.25 – 4.75 litres per 25 kg bag), mixing with a mechanical mixer (low RPM drill with mixer blade or mortar mixer) until the mix is even and without lumps. When using small amounts of mix, a trowel can also be used. However, in this case, the amount of water required may be higher. Moreover, this will lead to a decrease in the mechanical and qualitative results (increase in shrinkage and danger of cracking). The mix prepared in this way has a pot-life of approximately 30 minutes under normal conditions (+20 °C). If the temperatures are higher, the pot-life is reduced.

Application

Apply the Restauro R2 mix by hand to the set but not completely hardened rendering coat using a trowel or straight-edge, or by spraying with a plaster gun (due to the rapid setting time, it is necessary to clean the tubes and the nozzle of the gun every time there is a pause in work – this prevents clogging, which is difficult to clear). As a finish, we recommend Restauro Finitura or Monorasante.

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

Consistency	Powder
Bulk density (MIT 13*)	1,400 kg/m ³
Granulometry(EN 12192-1)	0-3 mm
Water soluble chlorides (EN 15015-17) (EN 1504-3 requirement $\leq 0.05\%$ by mass)	< 0,05%
Mixing water	17-19%
Mix consistency	thixotropic
Density of fresh mix (EN 1015-6)	2.050 kg/m ³
Mix pot life (EN 13395)	approx. 30 min.
Setting time: start(EN 196-3)	approx. 40 min.
Setting time: finish (EN 196-3)	approx. 100 min.
Application temperature	from +5 °C to +30 °C
Consumption per m ³ of mortar	approx. 1.800 kg
Operating temperature	from -20 °C to +90 °C
Density of hardened mortar (EN 12190)	2.030 kg/m ³
Flexing strength at 28 days (EN 12190)	8 MPa
Compressive strength at 28 days (EN 12190) (requirement EN 1504-3 ≥ 15 MPa)	≥ 35 MPa
Compression modulus of elasticity (MIT 90*)	15,0 GPa
Capillary absorption coefficient (EN 13057) (requirement EN 1504-3 ≤ 0.5 kg/(m ² •h ^{0,5}))	0,46 kg/(m ² •h ^{0,5})
Adhesion bonding (EN 1542) (EN 1504-3 requirement ≥ 0.8 MPa)	1,5 MPa
Impeded shrinkage/expansion (EN 12617-4) (requirement EN 1504-3 Bond strength after test: ≥ 0.8 MPa)	1,5 MPa
Thermal compatibility (freezing-thawing cycles) (EN 13687-4) (requirement EN 1504-3 Bond strength after cycles: ≥ 0.8 MPa)	> 1,5 N/mm ²
Reaction to fire (EN 13501-1) (requirement EN 1504-3 value declared by the manufacturer)	Class A1
Product classification (EN 1504-3)	R2 PCC

1 MPa is equal to 1 N/mm²

(*) Torggler internal methods (MIT) are available on request.

Packaging	bag
Pallet	50 bags
Packaging size	25 kg
Color	Grey

CONSUMPTION

Use approximately 19 kg/m² per cm of thickness.

STORAGE

Restauro R2 must be stored in a dry, cool and protected area. If closed in the original bags, it can be stored for at least 9 months.

CERTIFICATIONS

Product tested and classified as R2 PCC as per UNI EN 1504-3. The EC Declaration of Conformity and the related official test certificates are available on request.

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 03.11.2021.