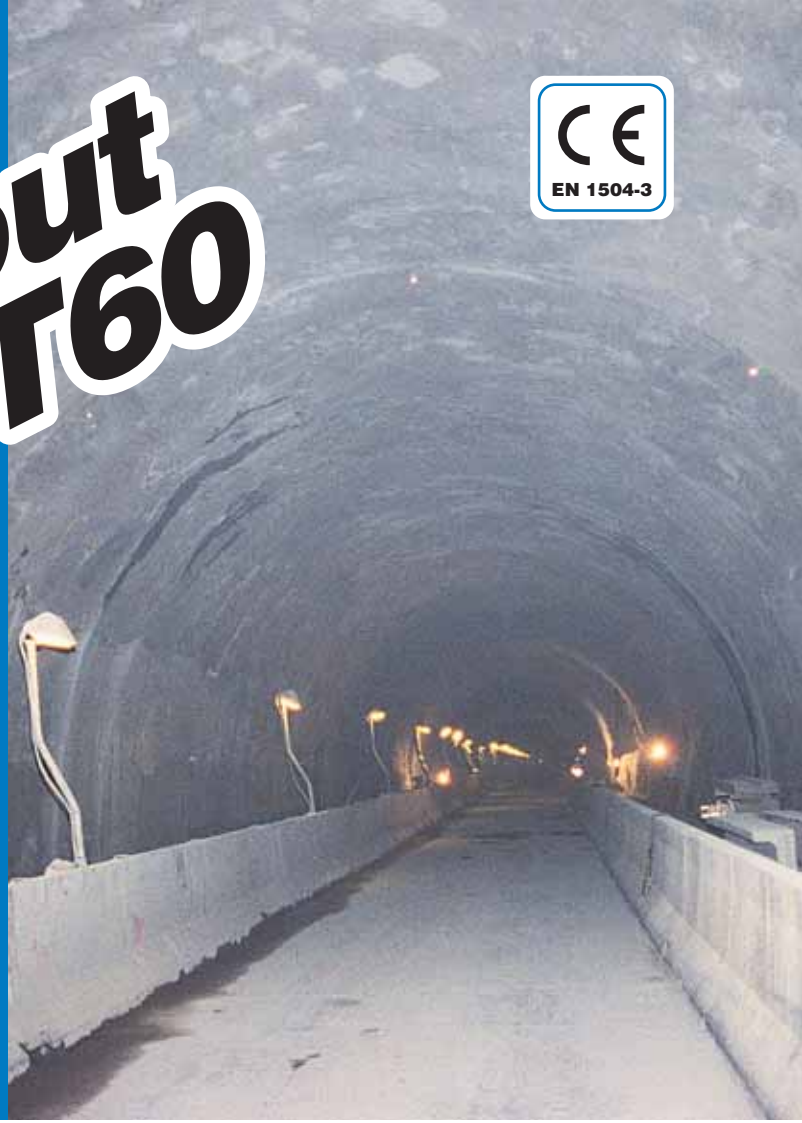




MapegROUT T60

**One component
sulphate-resistant,
fibre-reinforced
thixotropic grout for
the repair of concrete**



WHERE TO USE

Repair of degraded concrete structures or reinforced concrete structures subject to sulphate attack.

Some application examples

- Canal linings, hydraulic works, and tunnels that require resistance to sulphate attack.
- Repair and reconstruction of concrete coverings damaged by corroded reinforcing bars.
- Filling of rigid joints (e.g. between base and column, cracks in floors, joints between walls, etc.).
- Repair of precast structures.

TECHNICAL CHARACTERISTICS

MapegROUT T60 is a one-component pre-blended thixotropic cement-based mortar composed of sulphate-resistant hydraulic binders, synthetic polyacrylonitrile fibres, organic corrosion inhibitors, select aggregates and special water-retaining additives developed in the MAPEI Research Laboratories. If **MapegROUT T60** is prepared by only adding water, it must be cured under damp conditions in order to guarantee that the product's expansive properties develop completely and correctly. However, it is not very easy to guarantee that these conditions are created on site. Therefore, to guarantee that the expansive properties of **MapegROUT T60** take place when drying in the open air, 0.25% of **Mapecure SRA**, a special additive which has the property of reducing both plastic and hydraulic shrinkage, may be used to great advantage by adding it to the mix.

Mapecure SRA has a very important role to play, in guaranteeing better curing of mortar. Also, when mixed with **MapegROUT T60**, it may be considered a technologically advanced system, in that the additive has the capacity of slowing down evaporation of the water and of promoting the development of hydration reactions.

Mapecure SRA behaves like an internal curing agent and, thanks to its interaction with some of the main components which make up the cement, it helps to reduce shrinkage by between 20% and 50% compared with the standard values of the product without the additive. This will obviously lead to a lower incidence of cracking phenomena.

MapegROUT T60 may be used also without adding **Mapecure SRA**, in case the environmental conditions permit optimal curing.

MapegROUT T60 meets the requirements defined by EN 1504-9 (*"Products and systems for the protection and repair of concrete structures - Definitions, requirements, quality control and evaluation of conformity - General principles for the use of products and systems"*) and the minimum requirements claimed by EN 1504-3 (*"Structural and non structural repair"*) for structural mortars of class R4.

RECOMMENDATIONS

- Do not use **MapegROUT T60** on smooth surfaces: roughen the surface thoroughly and add rebars if necessary.
- Do not use cement or admixtures with **MapegROUT T60**.
- Do not pour **MapegROUT T60** into forms (use **MapegROUT Hi-Flow**).

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- Do not use **Mapegrout T60** for anchoring (use **Mapefill** or **Mapefill R**).

APPLICATION PROCEDURE

Substrate preparation

- Remove degraded and loose concrete down to the solid, resistant and roughened part of the substrate. Any previous repair work that is no longer thoroughly bonded must also be removed.
- Sandblast the concrete and the reinforcing bars until they are free of dirt, rust, cement laitance, grease, oil, varnish or old paint.
- Saturate the substrate with water.
- Before repairing with **Mapegrout T60**, wait until the excess water has evaporated. To facilitate the elimination of free water, use compressed air if needed.

Preparing the grout

Pour into the mixer the amount of water needed to obtain the consistency required for the application.

| Application | Litres of water per 25 kg bag |
|-------------|-------------------------------|
| Trowel | 4.1-4.3 |
| Spray | 4.2-4.4 |

- Start the mixer and slowly add **Mapegrout T60** to the water in a continuous flow.
- If improved open-air curing of the mortar is required, add **Mapecure SRA** at the end of the mixing phase at a dosage of 25% in weight of the mortar (0.25 kg every 100 kg of **Mapegrout T60**).
- Mix for 1 to 2 minutes, then check to make sure the mix is well blended. Scrape any unmixed powder from the bottom and the sides of the mixer. Mix again for another 2 to 3 minutes.
- Depending on the amount needed, a mortar mixer or a drill with an agitator attachment may also be used. Mix at low speed to avoid entraining air.
- Avoid mixing manually unless absolutely necessary. If so, mix small amounts at a time for at least 5 to 6 minutes until a completely homogeneous paste is obtained.

Keep in mind that mixing by hand requires a larger amount of water. This adversely affects several of the mortar's properties, including mechanical strength, shrinkage, watertightness, etc.

Mapegrout T60 remains workable for approx. 1 hour at +20°C.

The expansion of **Mapegrout T60** is calculated to compensate for hygrometric shrinkage. For it to be effective, the expansion needs to be restrained by rebars or restraints inserted into the substrate. Buildups of **Mapegrout T60** without restraints in thicknesses of more than 2 cm should be done only after inserting rebars and roughening the surface of the concrete,

take care to cover the reinforcement with a layer at least 2 cm thick.

Lesser thicknesses can be applied without rebars as long as the substrate has been thoroughly roughened to counter the expansion. The expansion phase ends during the first days of hardening.

Application procedure

Mapegrout T60 may be applied with a putty knife or trowel on vertical surfaces in layers up to 4 cm thick, or on ceilings in layers up to 2 cm thick, without the use of form-work. It may also be applied using a suitable piston or worm-screw type rendering machine, such as a Turbosol or Putzmeister. Do not use a continuous mixing type rendering machine.

For repairing concrete surfaces (e.g. balconies, columns, beams, etc.) we recommend treating the rebars with **Mapefer** or **Mapefer 1K** after sanding them.

When further coats of **Mapegrout T60** are needed, leave the previous coat rough and wet the surface with water.

Precautions to be taken during and after application

- Only use sacks of **Mapegrout T60** which have been stored on their original pallets and covered and stored in a dry place.
- In warm weather do not expose the material to direct sunlight. Use cold water to prepare the mix. Store in a cool place.
- At low temperatures, prepare the mix with water heated to approx. +20°C.

After applying **Mapegrout T60**, we recommend that it is cured carefully, especially in hot or windy weather, to avoid the water evaporating too quickly and causing the formation of surface cracks due to plastic shrinkage. Spray water on the surface 8-12 hours after applying the mortar, and repeat the operation (every 3-4 hours) for at least the first 48 hours. As an alternative, after tamping the mortar, spread on a layer of either **Mapecure E** anti-evaporation treatment in watery emulsion with a low-pressure pump, **Mapecure S** solvent-based curing film for mortar and concrete or **Elastocolor Primer** solvent-based, high-penetration primer for absorbent substrates and curing agent for repair mortar. **Mapecure E** and **Mapecure S**, as with all the best quality products in the same category which are currently available on the market, impede bonding of successive dressing layers. Therefore, if a smoothing layer or paint is to be applied later, they must be completely removed by sandblasting. If **Elastocolor Primer** is used as an anti-evaporation treatment, on the other hand, a final protective layer of **Elastocolor Paint** or **Elastocolor Rasante** may be applied directly on the treated surface without having to remove it.

Cleaning

Grout that has not yet hardened can be removed from tools with water.

TECHNICAL DATA (typical values)

PRODUCT IDENTIFICATION

| | |
|--|---|
| Class according to EN 1504-3: | R4 |
| Type: | CC |
| Consistency: | powder |
| Colour: | grey |
| Maximum aggregate size (mm): | 2.5 |
| Bulk density (kg/m³): | 1,350 |
| Dry solids content (%): | 100 |
| Chloride ions content: – minimum requirement ≤ 0.05% according to EN 1015-17 (%): | ≤ 0.05 |
| Storage: | 12 months in original packaging in a dry place |
| Hazard classification according to EC Directive 1999/45: | irritant. Before using refer to the “Safety instructions for preparation and application” paragraph and the information on the packaging and Safety Data Sheet |
| Customs class: | 3824 50 90 |

PRODUCT APPLICATION DATA (at +20°C - 50% R.H.)

| | |
|--|--|
| Colour of the mix: | grey |
| Mixing ratio: | 100 parts of Mapegrout T60 with 16.5-17.5 parts water (approx. 4.1-4.4 l per 25 kg sack) and 25% of Mapecure SRA (one 0.25 kg bottle for 4 sacks of Mapegrout T60) |
| Consistency of the mix: | thixotropic |
| Density of the mix (kg/m³): | 2,200 |
| pH of the mix: | > 12.5 |
| Application temperature range: | from +5°C to +35°C |
| Pot life of the mix: | ca. 1 hour |
| Waiting time between one layer and the next: | max 1-2 hours |

FINAL PERFORMANCE (17% mixing water)

| Performance characteristic | Test method | Requirements according to EN 1504-3 standards for R4 class mortar | Performance of product |
|---|--|---|---|
| Compressive strength (MPa): | EN 12190 | ≥ 45 (after 28 days) | > 20 (after 1 day) > 45 (after 7 days) > 60 (after 28 days) |
| Flexural strength (MPa): | EN 196/1 | none | > 4 (after 1 day) > 7 (after 7 days) > 8 (after 28 days) |
| Modulus of elasticity in compression (GPa): | EN 13412 | ≥ 20 (after 28 days) | 27 (after 28 days) |
| Bond strength to concrete (MC 0.40 - type substrate water/concrete ratio = 0.40) according to EN 1766 (MPa): | EN 1542 | ≥ 2 (after 28 days) | > 2 (after 28 days) |
| Contrasted expansion (µm/m): | UNI 8147 | none | > 400 after 1 day |
| Crack resistance: | “O Ring Test” | none | no cracks after 180 days |
| Resistance to accelerated carbonation: | EN 13295 | Depth of carbonatation ≤ reference concrete (MC 0.45 type with water/concrete ratio = 0.45) according to UNI 1766 | test passed |
| Impermeability to water - penetration depth - (mm): | EN 12390/8 | none | < 5 |
| Capillary absorption (kg/m²·h ^{0.5}): | EN 13057 | ≤ 0.5 | < 0.25 |
| Slip resistance of steel rods - bonding stress - (MPa): | EN 15184 | none | ≥ 25 |
| Bond strength measured according to EN 1542 (MPa): – freeze-thaw cycles with deicing salts immersion – storm cycling: – dry cycling: | EN 13687/1 EN 13687/2 EN 13687/4 | ≥ 2 (after 50 cycles) ≥ 2 (after 30 cycles) ≥ 2 (after 30 cycles) | > 2 > 2 > 2 |
| Reaction to fire: | Euroclass | value declared by manufacturer | A1 |

The mechanical strength of **Mapegrout T60** with the addition of aggregate 30% by weight of the grout remains the same as the mechanical strength of the grout without the addition of aggregate.

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After setting, cleaning is very difficult and can only be done mechanically.

CONSUMPTION

18.5 kg/m² per cm of thickness if used pure and 14.5 kg/m² if used mixed with 30% of 3 to 6-8 mm aggregate.

PACKAGING

25 kg bags and 1500 kg "Big Bags".

STORAGE

12 months if stored in a dry, sheltered place.

Manufactured in compliance with the regulations of the 2003/53/EC Directive.

SAFETY INSTRUCTIONS FOR PREPARATION AND INSTALLATION

Mapegrout T60 contains cement that, when in contact with sweat or other bodily fluids, produces an irritant alkaline reaction and allergic reactions in those predisposed. It is highly recommended to wear protective clothing, gloves and eye/face protection. For further information refer to the Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product report correspond to the best of our knowledge and experience, all the above information must, in every case, be taken as merely indicative and subject to confirmation after long-term practical applications: for this reason, anyone who intends to use the product must ensure beforehand that it is suitable for the envisaged application: in every case, the user alone is fully responsible for any consequences deriving from the use of the product.

**All relevant references
for the product are available
upon request and from
www.mapei.com**