

Mapegrout Thixotropic

Shrinkage-compensated fibre-reinforced mortar for concrete repair.



WHERE TO USE

Surface repair of deteriorated concrete structures on both vertical and horizontal surfaces.

Some application examples

- Repairing deteriorated areas of concrete, corners of pillars and beams, edges of balconies damaged by the oxidation of the reinforcing rods.
- Reconstruction of the concrete covers in reinforced concrete structures.
- Smoothing surface defects, such as honey combs, construction joints, holes created by formwork spacers, exposed rods, etc.
- Filling of rigid joints.
- Repair of surfaces subjected to heavy abrasion (canals, industrial floors, ramps, etc.).
- Smoothing of diaphragm walls and tunnels.
- Repairing viaducts for highways, roads and railways.

TECHNICAL CHARACTERISTICS

Mapegrout Thixotropic is a ready-mixed powdered mortar composed of high-strength cements, selected aggregates, special additives and synthetic fibres prepared according to a formula developed in the MAPEI research laboratories. When mixed with water, **Mapegrout Thixotropic** becomes an easily workable mortar with high thixotropic properties that can be applied on vertical surfaces without sagging even in great thicknesses and with no need for formwork.

Mapegrout Thixotropic is prepared by only adding water, it must be cured under damp conditions in order to guarantee that the product expansive properties develop completely and correctly. Unfortunately, it is not easy to guarantee that these conditions are created on site.

However, to guarantee that the expansive properties of **Mapegrout Thixotropic** are carried out 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 when added to the mix.

Mapecure SRA has a very important role to play, in guaranteeing better curing of mortar. Also, when mixed with **Mapegrout Thixotropic**, 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.

Basically, **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 reduced risk of cracking.

Once hardened, **Mapegrout Thixotropic** has the following properties:

- Very high flexural and compressive strength.
- Modulus of elasticity, coefficient of thermal expansion, and permeability to water vapour similar to those of high-quality concrete.
- It has high adhesion to old concrete, provided it has been soaked with water beforehand, and also to reinforcing rods, especially if they have been treated with **Mapefer** or **Mapefer 1K**.
- High resistance to abrasion. **Mapegrout Thixotropic** 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.

RECOMMENDATION

- Do not use **Mapegrout Thixotropic** on smooth concrete surfaces: roughen them well, and if necessary add reinforcing rods.
- Do not use **Mapegrout Thixotropic** for anchors (use **Mapesfill**).
- Do not use **Mapegrout Thixotropic** to repair structures by pouring into formwork (use **Mapegrout Hi-Flow** or **Mapegrout ME06**).
- Do not add cement, aggregates, or additives to **Mapegrout Thixotropic**.
- Do not add water after the mix has started to set.
- Do not apply **Mapegrout Thixotropic** at temperatures below +5°C.
- Do not use **Mapegrout Thixotropic** if the packing has been damaged or if it has been opened beforehand.

APPLICATION PROCEDURE

Preparing the substrate

- Remove degraded and or loose concrete until a sound and solid substrate is achieved.
- Where necessary clean the concrete and reinforcing steel by sweep blasting or other approved mechanical methods, to remove all dirt, any corrosion products, cement laitance, grease, oil, any previous coatings, and other deleterious elements.
- Any previous repairs that are no longer thoroughly bonded must also be removed.
- Pre-soak the substrate with clean, potable grade water to obtain a saturated surface dry (SSD) condition. Before repairing with **Mapegrout Thixotropic** allow the excess water to evaporate. If necessary, use oil-free compressed air or sponges to facilitate the removal of water.

Preparing the mortar

- Pour into the mixer the amount of water corresponding to the consistency required for the application (15.5-16.5% of the powder).
- Start the concrete mixer and slowly and continuously pour **Mapegrout Thixotropic** into the water.
- If improved open-air curing of the mortar is required, add **Mapecure SRA** to the final mix at a dosage of 0.25% by weight of the mortar (0.25 kg every 100 kg of **Mapegrout Thixotropic**).
- Mix for 1-2 minutes, checking the homogeneity of the mix while scraping any unmixed powder off the sides of the mixer; remix for another 2-3 minutes.
- Depending on the quantity to be prepared, a mortar mixer or a drilling machine with a stirrer attachment can be used. The mixing must be carried out at low speed to avoid entraining an excess of air into the mix.

Mapegrout Thixotropic has a pot life of about 1 hour at +20°C.

The expansion of **Mapegrout Thixotropic** has been calculated to compensate for hygrometric shrinkage. In order to be effective, the expansion must be countered with suitable reinforcement or formwork around the structure. Without formwork, **Mapegrout Thixotropic** can only be applied in thicknesses greater than 2 cm if the surface has been roughened and reinforcing rods have been placed, taking care to apply at least 2 cm of cover to the reinforcement. Smaller thicknesses can be applied without reinforcing rods as long as the substrate is sufficiently rough to be able to counter the expansion. This expansion phase is completed during the first days of curing.

Applying the mortar

The mix can be applied with a flat or gauging trowel with no need for formwork even on vertical surfaces or ceilings; the maximum thickness allowed is 30-35 mm per layer. **Mapegrout Thixotropic** can also be sprayed with a suitable piston or worm screw type rendering machine (Turbosol - Putzmeister), excluding continuous mixing machines. Apply **Mapegrout Thixotropic** after treating the reinforcing rods with **Mapefer** or with **Mapefer 1K**.

When a further layer of **Mapegrout Thixotropic** is necessary, it must be applied before the previous one has completely set (not more than 4 hours at +23°C). The repair process is complete when a smoothing coat of **Mapefinish** and a coat of **Elastocolor Paint** have been applied.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

In hot working conditions the following precautions should be taken:

- Avoid direct exposure to sunlight for stored material and also mixing equipment.
- Prior to use, the product must be stored in a shaded area out of direct sunlight.
- Use cool water for mixing.
- Avoid application during the hottest time of the day and/or in direct sunlight.
- Mix only sufficient material that can be applied using available labour and equipment.
- At low temperatures, prepare the mix with water heated to approx. +20°C.

CURING

In accordance with good concrete practice, all exposed surfaces of **Mapegrout Thixotropic** must be immediately cured after application, using wet hessian covered with polythene sheeting; failure to cure the open surfaces can cause the formation of cracks due to plastic shrinkage, especially in hot and/or windy climatic conditions; **Mapecure SRA** should also be considered.

Spray water onto the surface of the application within the first 8-12 hours and repeat the operation for at least the first 48 hours. As an alternative, after finishing the application of the material, apply a coat of curing membranes such as **Mapecure E**, **Mapecure S**, or **Elastocolor Primer**. On the other hand, the final protective layer of **Elastocolor Paint** or **Elastocolor Rasante** may be applied directly on the treated surface without having to remove. Film-forming curing membranes can impair the adhesion of subsequent finishes, please consult your local MAPEI technical representative for further advice.

Cleaning

Before hardening, the mortar can be cleaned tools with water. After setting, cleaning is very difficult and the mortar can only be removed mechanically.

COVERAGE

19 kg/m² per cm of thickness.

YIELD

13.0 litres per 25 kg bag

PACKAGING

25 kg bags.

STORAGE

Mapegrout Thixotropic may be stored for up to 12 months in its original packaging. The product is available in special 25 kg vacuum-packed polyethylene bags which may be stored outside for the entire construction phase of the site. Rain has no effect on its characteristics.

SAFETY INSTRUCTIONS FOR PREPARATION AND INSTALLATION

Mapegrout Thixotropic is an irritant, it contains cement that when in contact with sweat or other body fluids causes the irritant alkaline reaction and allergic reactions to those predisposed. It is recommended to use protective gloves and goggles and to take the usual precautions for the handling of chemicals. In case of contact with eyes or skin wash immediately with plenty of water and seek medical attention.

For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

TECHNICAL DATA (typical values)	
PRODUCT IDENTIFICATION	
Class according to EN 1504-3:	R4
Type:	PCC
Consistency:	powder
Color:	grey
Maximum aggregate size (mm):	2.5
Bulk density (kg/m ³):	1,250
Dry solids content (%):	100

Chloride ions content: – minimum requirements $\leq 0.05\%$ - according to EN 1015-17 (%):	≤ 0.05		
APPLICATION DATA (at +20°C - 50% R.H.)			
Colour of the mix:	grey		
Mixing Ratio:	100 parts of Mapegrout Thixotropic with 15.5-16.5 parts water (approx. 3.8-4.1 l per 25 kg bag)		
Consistency of mix:	thixotropic		
Density of the mix (kg/m ³):	2,200		
pH of the mix:	> 12.5		
Application temperature range:	from +5°C to +50°C		
Pot life of the mix at +20°C:	approx. 1 h		
FINAL PERFORMANCE (16% mixing water)			
Performance characteristic	Test method	Minimum requirements according to EN 1504-3 for R4 class mortar	Product performance
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	not required	> 4.5 (after 1 day)
			> 7.0 (after 7 days)
			> 8.5 (after 28 days)
Modulus of elasticity in compression (GPa):	EN 13412	≥ 20 (after 28 days)	26 (after 28 days)
Bond strength to concrete (MC 0.40 type substrate water/cement ratio = 0.40) according to EN 1766 (MPa):	EN 1542	≥ 2 (after 28 days)	> 2 (after 28 days)
Capillary absorption (kg/m ² ·h ^{0,5}):	EN 13057	≤ 0.5	< 0.20

IMPORTANT NOTES

Whilst we try to ensure that any advice, recommendations, or information given in our literature is accurate and correct, we have no control over the circumstances in which our product is used. It is therefore important that installers satisfy themselves that the product and conditions are suitable for the envisaged application. No warranty can be given or responsibility accepted other than, that the product supplied by us will meet our written specifications. The installer should ensure that our latest product data and safety information sheets have been consulted prior to use.

Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com.

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

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