MAPEI

IN COMPLIANCE WITH EUROPEAN STANDARD
EN 1504-3
R4
MAPEI
REPAIR MORTAR

Mapegrout Gunite

CE
EN 1504-3

One component, ready-to-use, multi-purpose, fibre-reinforced, cementitious mortar, applied using either the dry or damp spraying technique

WHERE TO USE

For the repair of concrete, stone and masonry structures, with mortar applied using either the dry or damp spraying technique.

Some application examples

- Repair of concrete coverings in road tunnels.
- Covering stone or masonry in tunnels.
- Repair of damaged bridges.
- Repair of hydraulic works such as canals, tunnels, reservoirs, etc.
- Repair of industrial concrete structures.
- For supporting excavation work in open-ground, in tunnels and for supporting excavation of foundation footings.
- Construction of swimming pools.

TECHNICAL CHARACTERISTICS

Mapegrout Gunite is a one-component premixed cementitious mortar composed of hydraulic binders, silica fume, select aggregate and special additives manufactured according to a formula developed in the MAPEI Research & Development laboratories.

When mixed with water **Mapegrout Gunite** acquires a thixotropic consistency and can therefore be easily applied on vertical surfaces, on soffits of tunnels and bridges in substantial thickness.

After setting, **Mapegrout Gunite**:

- has high flexural and compressive strength;
- is watertight;
- adheres very strongly to old concrete, provided the concrete is first saturated with water, and to reinforcement bars, especially when they are first treated with **Mapefer** or **Mapefer 1K**.
- resists sulphates;
- resists carbonation;
- resists freeze-thaw cycles in the presence of sodium chloride in compliance with SIA 162/1, section 9.

Mapegrout Gunite meets all the main principles of EN 1504-9 ("*Products and systems for the protection and repair of concrete structures: definitions, requirements, quality control and conformity assessment. General principles for the use of products and systems*"), and the minimum requirements for EN 1504-3 ("*Structural and non-structural repairs*") for R4 class structural mortars.

RECOMMENDATIONS

- If the layer applied is thicker than 30 mm, prior to application, we recommend creating a very rough surface on the substrate inserting steel retaining rods.

Mapegrout Gunite

- **Mapegrout Gunite** is supplied ready to use and no other materials are required on site.

APPLICATION PROCEDURE

Preparation of the substrate (masonry, stone and concrete)

- Surfaces must be free of oils, grease, dirt, and loose material.
- Remove the deteriorated concrete down to where the substrate is solid, resistant and rough-textured. Any previous repairs that are not perfectly bonded must be removed.
- Remove dirt, rust, cement laitance, grease, oil, varnish or paint from the concrete and rebars with a high pressure cleaner or by sandblasting.
- Saturate the substrate with water.
- Before beginning repairs with **Mapegrout Gunite**, wait until the excess water evaporates. If needed, remove free water using compressed air.
- If there are clear signs of water seeping in, we recommend applying **Lamposilex** to seal off the seepage points.

Dry application of the mortar

Mapegrout Gunite can be applied exclusively with a special dry mix spray machine and only after the surface has first been saturated with water. This preliminary operation can be carried out by using the hose of the spray machine to spray water on the substrate.

When mixed with water, which takes place inside the nozzle of the hose, **Mapegrout Gunite** acquires a thixotropic consistency and can be easily applied in thicknesses up to approx. 40 mm per coat without forms.

For thicknesses greater than 40 mm, apply in several coats. To facilitate bonding between coats we recommend leaving the surface of the previous coat rough and then spraying it lightly with water when it has hardened.

After applying the last coat, smooth with a float (after initial setting and before hardening). For a finer-textured finish, use **Mapefinish, Monofinish** or **Planitop T**.

Recommended equipment

OCMER type OCM-030 compact or OCM-045.

Damp application of the mortar

Once the substrate has been prepared (as described in the previous paragraph), damp application of the mortar may be carried out. We recommend adding water at a rate of 13% in weight of the mortar (3.25 l per sack) to give an ideal consistency for laying. After mixing, apply the mortar by dry spraying, or with a piston or worm screw-type rendering machine, such as a Turbosol or Putzmeister. If shorter setting times are required, damp application of the mortar may be carried out, but by adding a setting accelerator in the lance nozzle while spraying.

Cleaning

The mortar can be removed from tools with water if it has not yet hardened.
The dry mix machine can be cleaned using high pressure air only. The nozzle should be cleaned with water.

CONSUMPTION

Approx. 20 kg/m^2 per cm of thickness (about 22 kg/m^2 per cm of thickness considering a 10% rebound).

PACKAGING

25 kg bags.

STORAGE

Mapegrout Gunite may be stored up to 12 months in a dry place in its orginal packaging. The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH), item 47.
The special packaging, made from 25 kg vacuum-packed polyethylene bags, allows the product to be stored outside for the entire duration of the site. Rain has no effect on its characteristics.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapegrout Gunite is irritant, it contains cement that when in contact with sweat or other body fluids causes irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to eyes. In case of contact with eyes or skin wash immediately with plenty of water and seek medical attention. It is recommended to use protective gloves and goggles.
For further and complete information about the safe use of our product please refer to the latest version of our Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

WARNING

Although the technical details and recommendations contained in this product data sheet 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 application; 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.

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

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Material class according to EN 1504-3:	R4
Type:	CC
Consistency:	powder
Colour:	grey
Bulk density (kg/m³):	1,250
Maximum size of aggregate (mm):	2.5
Dry solids content (%):	100
Content of chloride ions: – minimum requirements ≤ 0.05% - according to EN 1015-17 (%):	≤ 0.05
APPLICATION DATA (at +20°C - 50% R.H.)	
Colour of mix:	grey
Mixing ratio:	*Dry application:* 100 parts of **Mapegrout Gunite** with 12-13 parts of water (3-3.25 l of water per 25 kg bag). *Damp application:* 100 parts of **Mapegrout Gunite** with 13 parts of water (3.25 l of water per 25 kg bag)
Consistency of the mix:	thixotropic
Density of the mix (kg/m³):	2,200
pH of mix:	> 12.5
Recommended application temperature range:	from +5°C to +35°C

FINAL PERFORMANCE (13% blending 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	5.0 (after 1 day) 7.0 (after 7 days) 9.5 (after 28 days)
Compressive modulus of elasticity (GPa):	EN 13412	≥ 20 (after 28 days)	26 (after 28 days)
Adhesion 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)
Shear adhesion (wedge test) (at +23°C - 50 U.R.) (MPa):	Motorways test method	not required	> 8.5 (after 28 days)
Impermeability to water (mm):	EN 12390/8	not required	< 5
Capillary absorption (kg/m²·h$^{0.5}$):	EN 13057	≤ 0.5	≤ 0.5
Resistance to freeze-thaw cycles with sodium chloride - weight loss (mg/mm²):	SIA 162/1 part 9	none	< 0.6
Reaction to fire:	EN 13501-1	Euroclass	A1

TYPICAL VALUES FOR TESTS CARRIED OUT ON SITE

Application of **Mapegrout Gunite** in combination with a setting accelerator from the **Mapequick** range. Recommended setting accelerators: **Mapequick AF 1000** or **Mapequick AFK 777T** at a dosage of 3-6% in weight of the total weight of **Mapegrout Gunite**: **– start setting time (minutes):** **– end of setting time (minutes):**	 ≤ 1 ≤ 2
An example of how the compressive strength develops by adding **Mapequick AF 1000** or **Mapequick 777T** alkaline-free setting accelerator at a rate of 5% in weight of the total weight of the powder (MPa): **– after 1 hour:** **– after 3 hours:** **– after 12 hours:** **– after 1 day:** **– after 7 days:** **– after 28 days:**	 > 1 > 3 > 6 > 15 > 45 > 60

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