



Mapegrout Gunitite FSD



**One-component, ready-to-use,
fibre-reinforced, cementitious mortar,
applied using wet or dry application spraying
technique with extra fast hardening**

WHERE TO USE

For the repair of concrete, stone and masonry structures, with the need of low dust emission and of low rebound.

Some application examples

- Repair of concrete lining in road/rail/metro tunnels.
- Fast support during excavation for D&B, hard rock TBMs and foundations.
- 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.

TECHNICAL CHARACTERISTICS

Mapegrout Gunitite FSD is a one-component pre-mixed cementitious mortar composed of hydraulic binders, silica fume, selected aggregate and special admixtures manufactured according to a formulation developed in the MAPEI research laboratories.

When mixed with water **Mapegrout Gunitite FSD** acquires a thixotropic consistency and can therefore be easily applied on vertical and overhead surfaces in substantial thickness.

The hardening process starts very early after the application, in order to improve:

- speed of application (several layers in a shorter time);
- safety during operation: manpower and equipment can move under the same area in shorter time if compared to standard gunites.

After hardening, **Mapegrout Gunitite FSD**:

- 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;

Mapegrout Gunitite FSD 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.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Material class:	R4
Type:	CC
Consistency:	powder
Colour:	grey
Maximum aggregate size (EN 1015-1) (mm):	1
Dry solids content (%):	100
Ion chloride content: Minimum requirement $\leq 0.05\%$ according to EN 1015-17 (%):	≤ 0.05

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

Colour of mix:	grey
Mixing ratio:	100 parts of Mapegrout Gunite FSD with 14.5-15.5 parts of water (3.6-3.9 l of water per each 25 kg bag)
Consistency:	thixotropic - trowellable
Density of the mix (kg/m³):	2.200
pH of the mix:	> 11.5
Application temperature range:	from +5°C to +35°C
Pot life of the mix:	approx. 25 minutes

FINAL PERFORMANCE

Performance characteristic	Test method	Requirements according to EN 1504-3 for R4-class mortar	Product performance
Compressive strength (MPa):	EN 12190	> 45	≥ 18 (after 3 hours) ≥ 25 (after 24 hours) ≥ 47 (after 28 days)
Flexural strength (MPa):	EN 196/1	not required	≥ 4 (after 3 hours) ≥ 5 (after 24 hours) ≥ 6 (after 28 days)
Compressive modulus of elasticity (GPa):	EN 13412	≥ 20 (after 28 days)	24 (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)
Thermal compatibility measured as adhesion according to EN 1542: Freeze-thaw cycles with de-icing salts (MPa):	EN 13687/1	≥ 2 (after 50 cycles)	≥ 2
Capillary absorption (kg/m²·h^{0.5}):	EN 13057	≤ 0.5	≤ 0.5
Resistance to accelerated carbonation:	EN 13295	Depth of carbonation \leq than the reference concrete (MC 0.45 type water/cement ratio = 0.45) according to UNI 1766	meets specifications
Reaction to fire:	EN 13501-1	Euroclass	A1

RECOMMENDATIONS

- Do not apply **Mapegrout Gunite FSD** on very smooth surfaces. Roughen them first and add reinforcement if necessary, and if the thickness is more than 50 mm.
- Do not add cement or admixtures to **Mapegrout Gunite FSD**.

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: this preliminary operation can be carried out by using the hose of the spray machine to spray water on the substrate.
- Before beginning repairs with **Mapegrout Gunite FSD**, 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.

Application of the mortar

Mapegrout Gunite FSD can be applied exclusively with a continuous mixer pump or with a rotor spray machine. In both cases the product is introduced in the hoppers in dry form.

When mixed with water, **Mapegrout Gunite FSD** acquires a thixotropic consistency and can be easily applied in thicknesses up to approx. 50 mm per coat without forms. For thicknesses bigger than 50 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

Continuous mixing unit: marmotta pump from ITALSWISS, M300 serie from M-TEC.
Rotor pump: OCMER type OCM-030 compact or OCM-045.

Precautions to be taken during and after application

- Only use bags of **Mapegrout Gunite FSD** which have been stored on their original, covered pallets.
- In hot weather, store the product in a cool area and use cold water to prepare the mix.
- In cold weather store the product in a closed area and protect from frost. Use tepid water to prepare the mortar.
- After applying and tamping **Mapegrout Gunite FSD**, and particularly in hot or windy weather, it is recommended to cure the mortar to prevent the mixing water evaporating too quickly, otherwise surface cracks may appear. Curing can be executed by spraying water on top of the mortar, or using a special curing agent from the **Mapecure** range.

Cleaning

The mortar can be removed from tools with water if it has not yet hardened. The nozzle should be cleaned with water.

CONSUMPTION

Approx. 25 kg per 13 liters of void to be filled.

PACKAGING

25 kg paper bags.

STORAGE

Mapegrout Gunite FSD can be stored for 12 months, in dry sheltered place.

The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH) - All. XVII, item 47.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapegrout Gunite contains cement that when in contact with sweat or other body fluids produces an irritant alkaline reaction and allergic reactions to those predisposed.

Wear 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

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Our Commitment To The Environment
MAPEI products assist Project Designers and Contractors create innovative LEED (The Leadership in Energy and Environmental Design) certified projects, in compliance with the U.S. Green Building Council.

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