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MAPEGROUT GUNITE FSD

Fast setting, single component, low dust, fibre-reinforced cementitious spray mortar for wet and dry application



WHERE TO USE

For the repair of concrete, stone and masonry structures, where low dust emission and low rebound is required. **Mapegrout Gunite FSD** complies with the Highways England specification for repairs to highway structures.

Some application examples

- Repair of concrete lining in road/rail/subway 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 Gunite FSD is a one-component ready-mixed cementitious mortar composed of hydraulic binders, silica fume, selected aggregate and special additives manufactured according to a formulation developed in the MAPEI research laboratories.

When mixed with water, **Mapegrout Gunite 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 mortars.

After hardening, **Mapegrout Gunite 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 Gunite 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.

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 additives 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 back 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 in wet form and manually for local application where the use of a pump is not necessary.

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 form work. 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 litres of void to be filled.

PACKAGING

25 kg paper bags.

STORAGE

Mapegrout Gunite FSD can be stored for 12 months in the original, unopened packaging in a dry sheltered place. Protect from frost and damp.

TECHNICAL DATA

TECHNICAL DATA (typical values) In compliance with:		– European EN 1504-3 – UKCA EN 1504-3	
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 EN1015-17 (%):	≤ 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/m ³):	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 (substrate type MC 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 (MPa): – Freeze-thaw cycles with de-icing salts:	EN 13687/1	≥ 2 (after 50 cycles)	≥ 2
Capillary absorption (kg/m ² ·h ^{0.5}):	EN 13057	$\leq 0,5$	$\leq 0,5$
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

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website www.mapei.co.uk.
PRODUCT FOR PROFESSIONAL USE.

N.B.

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 the end users 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 specification.
End users 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.co.uk

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The most up-to-date TDS can be downloaded from our website www.mapei.co.uk.

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