MAPEGROUT SV FIBER

Flowable, shrinkage compensated, quick setting and hardening, high-ductility cementitious mortar, applied at temperatures as low as -5°C, with stiff steel fibres, for repairing concrete

EN 1504-3

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

2in1
Polvere + Fibre
Powder + Fibers

Fast Track Ready

WHERE TO USE

Repairing concrete structures where high thicknesses and special shapes of deterioration require the use of a free-flowing mortar, including at low temperatures.

Some application examples

· Repairing concrete floors (industrial, roads, airports).
· Repairing hydraulic structures (breather channels, canals and forced run-off channels).
· Restoration of floor slabs after removing deteriorated areas by scarifying.
· Repairs to joints in motorways.
· Rebuilding and levelling off the upper parts of base plinths and reinforced concrete bearing elements on motorway viaducts.
· Repairing lower spigots on pre-compressed beams for viaducts.

TECHNICAL CHARACTERISTICS

Mapegrout SV Fiber is a pre-blended mortar in powder form, made from special hydraulic binders, high-strength cement, selected graded aggregates, special admixtures, and stiff, hooked fibres in brass-plated steel according to a formula developed in MAPEI's own research laboratories.
The stiff, hooked fibres in brass-plated steel contained in **Mapegrout SV Fiber** have the following characteristics:
· length: 30 mm;
· diameter: 0.38 mm;
· tensile strength: > 2,600 MPa.

When **Mapegrout SV Fiber** is mixed with water, it forms a fluid mortar which is suitable for casting into formwork, without segregation, at a thickness of between 1 and 5 cm.
Once hardened, **Mapegrout SV Fiber** has the following characteristics:
· high flexural and compressive strength;
· modulus of elasticity, thermal expansion coefficient and permeability coefficient similar to high quality concrete;
· impermeable to water;
· excellent bond strength to old concrete, if dampened with water before application, and to reinforcement rods, especially if treated beforehand with **Mapefer** or **Mapefer 1K**;
· high resistance to wear due to abrasion or impact.

Mapegrout SV Fiber meets the main requirements of EN 1504-9 ("*Products and systems for protecting and repairing concrete structures: definitions, requirements, quality control and conformity assessment. General principles for the use and application of systems*"), and the minimum requirements for EN 1504-3 ("*Structural and non-structural repairs*") for R4-class structural mortars.
Mapegrout SV Fiber is recommended for thicknesses of up to 5 cm. If a thicker layer is required, we recommend the addition of 30 to 50% in weight of a suitable size aggregate; refer to the MAPEI Technical Services Department for further

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details.
Thanks to its rapid hardening properties, **Mapegrout SV Fiber** may be walked on and opened to rubber-wheeled traffic after only 2 hours from application at a temperature of +23°C.

RECOMMENDATIONS

· Do not apply **Mapegrout SV Fiber** on smooth surfaces. Roughen the surface of the substrate (ridges of at least 5 mm) and, if necessary, add reinforcement rods.
· Do not apply **Mapegrout SV Fiber** on surfaces treated with asphalt or bitumen.
· Do not add cement or admixtures to **Mapegrout SV Fiber**.
· Do not add water once the mix has started to set.
· Do not use **Mapegrout SV Fiber** for fixing elements accurately in place (use **Mapefill** or **Mapefill R**).
· Do not use **Mapegrout SV Fiber** if the temperature is lower than -5°C or higher than +35°C. If the product has to be applied at a different temperature than the recommended application range, please contact the Technical Services Department.
· **Mapegrout SV Fiber** hardens very quickly. Therefore we recommend preparing quantities of the product which will be applied within 20 minutes of mixing.
· Do not use **Mapegrout SV Fiber** if the packaging is damaged.

APPLICATION PROCEDURE

Preparation of the substrate
· Remove all deteriorated and loose concrete to form a solid, rough and strong substrate. Any areas previously repaired and which are not perfectly bonded must also be removed.
· Remove all dust, rust, cement laitance, grease, oil and old paint from the concrete and reinforcement rods by sandblasting.
· Saturate the substrate with water.
· Before casting, wait until excess surface water has evaporated off. Use compressed air to accelerate this process if required.

Preparation of the mortar
Pour 3.4-3.6 litres of water into the cement mixer, slowly add **Mapegrout SV Fiber**.
Mix for 2-3 minutes, remove all powder which has stuck to the walls of the mixer and mix again for 2-3 minutes to form a fluid, lump-free mix.
A mortar mixer or drill with a mixer fitting may also be used, according to the quantity of mortar required. Avoid excessive air entrainment while mixing.
Mapegrout SV Fiber remains workable for approximately 20 minutes at +20°C.
If there is insufficient boundary support, filling layers of **Mapegrout SV Fiber** thicker than 5 cm must only be applied after inserting reinforcing rods. A layer of at least 2 cm thick must be applied over the rods.

Application of the mortar
Pour **Mapegrout SV Fiber** in a continuous flow from one side only of the area to be filled, making sure that all air is expelled.
Immediately smooth over the surface with a trowel.
After application, **Mapegrout SV Fiber** does not require vibration.
If applied in formwork, water must not be absorbed from **Mapegrout SV Fiber**. In this case, we recommend treating the formwork with a form-release agent (for example **Form Release Agent DMA 1000**).

Preparation of the holes to insert the reinforcement rods (dowelling)

Removing dust with a vacuum cleaner

Fixing reinforcement rods for the dowelling in place using Adesilex PG1

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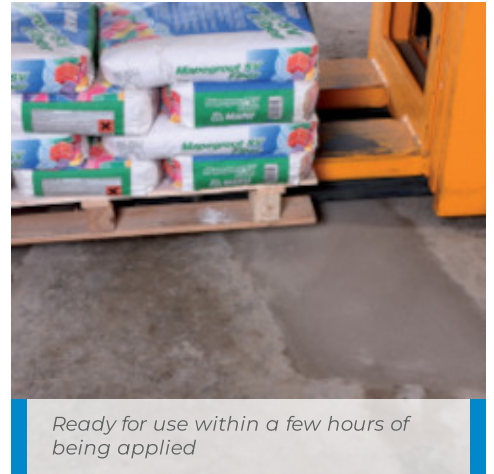*Preparation of the Mapegrout SV Fiber mix*

Consistency of the mix

Application of Mapegrout SV Fiber in the area under repair

Levelling off Mapegrout SV Fiber with a straight-edge

Tamping Mapegrout SV Fiber

Ready for use within a few hours of being applied

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

· Only use bags of **Mapegrout SV Fiber** which have been stored unopened on their original 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 application, and particularly in hot or windy weather, we recommend curing **Mapegrout SV Fiber** carefully, to avoid the mixing water evaporating too quickly, otherwise surface cracks may appear due to plastic shrinkage. Spray water on the surface 2-4 hours after applying the mortar and repeat this operation at regular intervals for at least 48 hours.

As an alternative, after tamping the surface of the mortar, apply **Mapecure E**, anti-evaporation agent in water emulsion with a low pressure pump, **Mapecure S**, film-forming curing agent for mortar and concrete or **Elastocolor Primer**, high-penetration solvent fixing agent for absorbent surfaces and curing agent for repair mortar.

As with all the best products in this category available on the market, they impede a good bond of successive layers. Therefore, if a smoothing layer or paint is to be applied after, they must be completely removed by sandblasting.

If **Elastocolor Primer** is used to block evaporation, the final protective layer of **Elastocolor Paint** or **Elastocolor Rasante** may be applied directly on the surface without removing it.

CLEANING

Fresh mortar may be removed from tools used to prepare and apply the mortar with running water.
Once hardened, cleaning is much more difficult, and the mortar must be removed mechanically.

CONSUMPTION

Approximately 20 kg/m² per cm of thickness.

PACKAGING

Mapegrout SV Fiber is supplied in 25 kg bags.

STORAGE

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

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapegrout SV Fiber 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 and to take the usual precautions when handling chemical products.
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.

TECHNICAL DATA (typical values)	
PRODUCT IDENTITY	
Class according to EN 1504-3:	R4
Type:	CC
Consistency:	powder
Colour:	grey
Bulk density (kg/m³):	1,300
Maximum aggregate size (mm):	2.5
Dry solids content (%):	100
Ion chloride content: – minimum requirement ≤ 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 SV Fiber** with 13.5-14.5 parts of water (approx. 3.4-3.6 litres of water per 25 kg bag)
Consistency of the mix:	fluid
Slump according to EN 13395/1 (mm):	215
Density of the mix (kg/m³):	2,350
pH of the mix:	> 12
Application temperature range:	from -5°C to +35°C
Pot life of the mix:	approx. 20 minutes
FINAL PERFORMANCE (13.5% mixing water)	

Performance characteristics	Test method	Requirements according to EN 1504-3 for R4 class mortar	Product performance			
Compressive resistance (MPa):	EN 12190	≥ 45 (after 28 days)	–	-5°C[*]	0°C	+20°C
			2 hours	10	14	23
			4 hours	15	18	30
			8 hours	18	23	40
			1 day	27	32	50
			7 days	57	60	65
			28 days	70	70	70
Flexural strength (MPa):	EN 196/1	not required	15 (after 1 day at +20°C) 18 (after 7 days at +20°C) 20 (after 28 days at +20°C)			
Compressive modulus of elasticity (GPa):	EN 13412	≥ 20 (after 28 days)	29 (after 28 days)			
Bond strength on concrete (substrate in MC 0.40 - water/cement ratio = 0.40) according to EN 1766 (MPa):	EN 1542	≥ 2 (after 28 days)	> 2 (after 28 days)			
Crack resistance:	"O Ring Test"	not required	no cracks after 180 days			
Resistance to accelerated carbonation:	EN 13295	carbonation depth ≤ than the reference concrete (MC 0.45 type water/cement ratio = 0.45) according to UNI 1766	meets specifications			
Impermeability to water: – penetration depth - (mm):	EN 12390/8	not required	< 5			
Capillary absorption (kg/m²·h$^{0.5}$):	EN 13057	≤ 0.5	< 0.35			
Slip-resistance of steel reinforcement rods – bonding stress (MPa):	RILEM-CEB-FIP RC6-78	not required	> 25			
Thermal compatibility measured as bonding according to EN 1542 (MPa): – freeze-thaw cycles with deicing salts: – storm cycle: – dry thermal cycle:	EN 13687/1 EN 13687/2 EN 13687/4	≥ 2 (after 50 cycles) ≥ 2 (after 30 cycles) ≥ 2 (after 30 cycles)	> 2 > 2 > 2			
Toughness: – load at first cracking: – toughness index:	ASTM C1018	not required	> 20 kN I_{20} > 20			
Reaction to fire:	EN 13501-1	Euroclass	A1			

[*] *The strength values at -5°C refer to mixes prepared using product, water and formworks held at +5°C and then cured at -5°C.*

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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