



Mapegrout SV-HP Fiber



Ultra high performance, high-ductility, steel fibre-reinforced, rapid-setting and hardening, compensated-shrinkage, hi-flow cementitious mortar applicable at temperatures down to -5° for repairing concrete

WHERE TO USE

Repairing concrete structures in general, particularly those subjected to dynamic stress, cyclical loads, impact loads and vibration, including at low temperatures.

Some application examples

- Repairing concrete floors in industrial environments, shopping centres and warehouses.
- Repairing concrete floor slabs.
- Rebuilding and levelling off the upper parts of pier-caps and bearing elements on motorway viaducts.
- Repairing the ends of floor slabs.
- Repairing concrete road surfaces in airports.
- Repairing hydraulic structures.

TECHNICAL CHARACTERISTICS

Mapegrout SV-HP Fiber is a one-component, ready-mixed powdered mortar made from special hydraulic binders, high-strength cement, synthetic polyacrylonitrile fibres and stiff steel fibres, selected aggregates and special additives according to a formula developed in the MAPEI research laboratories. Thanks to its special composition, this product develops very high mechanical properties after short curing periods, including when applied at temperatures down to -5°C. When **Mapegrout SV-HP Fiber** is mixed with water it has a fluid consistency, making it suitable for casting into sealed formwork in layers up to 5 cm thick without segregating.

If layers more than 5 cm are required, add 30-40% of **Gravel 6-10** to **Mapegrout SV-HP Fiber**.

When completely hardened, **Mapegrout SV-HP Fiber** has the following properties:

- high flexural and compressive strength;
- modulus of elasticity, thermal expansion coefficient and permeability coefficient similar to high quality concrete;
- impermeability to water
- excellent adhesion to both old concrete, if dampened with water before application, and to rebar, especially if treated beforehand with **Mapefer** or **Mapefer 1K**;
- high resistance to impact loads.

Thanks to its rapid hardening properties, the mortar sets to foot traffic and may be used by wheeled vehicles just a few hours after application at +20°C.

Mapegrout SV-HP Fiber complies with the principles defined in 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 use of products and systems"*), and the minimum requirements of EN 1504-3 (*"Structural and non-structural repairs"*) for R4-class structural mortars.

RECOMMENDATIONS

- Do not add cement or admixes to **Mapegrout SV-HP Fiber**.
- Do not use **Mapegrout SV-HP Fiber** if the packaging is damaged.
- Do not add water once the mix has started to set.
- Do not apply **Mapegrout SV-HP Fiber** on asphalt or on surfaces treated with bitumen.
- Do not apply **Mapegrout SV-HP Fiber** on smooth surfaces. Roughen the surface of the substrate (to at

Mapegrout SV-HP Fiber

- least 5 mm) and, if necessary, insert dolly rods.
- Do not use **Mapegrout SV-HP Fiber** if the temperature is lower than -5°C or higher +35°C.
- Mapegrout SV-HP Fiber** hardens very quickly and it is recommended, therefore, to only mix quantities of mortar that will be applied within 10 minutes of adding the mixing water at +20°C.

APPLICATION PROCEDURE

Preparation of the substrate

- Remove all damaged and detached areas of concrete to form a sound, rough and strong substrate. Any areas previously repaired and which are not perfectly bonded must be removed.
- Remove all traces of paint, oil, dust and any other material or substance that could affect adhesion of **Mapegrout SV-HP Fiber** to the substrate.
- Treat any exposed rebar with **Mapefer** or **Mapefer 1K** according to the procedure illustrated in the relative Technical Data Sheet for each product.
- Wait until the **Mapefer** or **Mapefer 1K** has dried.
- Saturate the substrate with water.
- Before applying **Mapegrout SV-HP Fiber**, wait until any excess water has evaporated off; use compressed air to accelerate this process if necessary.

Preparation of the mortar

Pour 12 -13% of water (approx. 3.0-3.25 litres every 25 kg bag of product) into a cement mixer, depending on the consistency required. Slowly add the **Mapegrout SV-HP Fiber** and mix for 1-2 minutes.

Remove all traces of powder from the sides and bottom of the mixing drum and mix again for 2-3 minutes to form an even mix.

A mortar mixer or low speed drill with a mixing attachment may also be used, depending on the amount of mortar required. Avoid entraining too much air while mixing. If the areas to be integrated are thicker than 5 cm, mix **Mapegrout SV-HP Fiber** with 30-40% of **Gravel 6-10**.

Applying the mortar

Pour **Mapegrout SV-HP Fiber** into the area prepared as specified and finish off the surface immediately with a trowel; a vibro-poker is not required to spread the mortar. If the product is used to fix manholes or manhole covers in place, and the area around the repair needs to be re-asphalted, it is recommended to form a layer at least 3 cm thick in that area to allow the layer of bitumen to bond firmly and to withstand the weight of vehicles without subsiding.

The mortar maintains its workability for around 10 minutes from when the mixing water is added at +20°C.

PRECAUTIONS DURING APPLICATION

Low temperatures

- Make sure the substrate is not frozen and protect the product from freezing conditions for the first 24 hours after pouring.

- Mix the product with lukewarm water.
- Store the product in an area away from freezing weather and damp before use.

High temperatures and/or windy weather

- Saturate the substrate with water.
- Use cold water to prepare the mortar.
- Protect the surface of wet mortar to prevent the water evaporating off too quickly and generating plastic shrinkage cracks with **Mapecure S** or **Mapecure E**.

Cleaning

Remove wet mortar from tools used to prepare and apply the mortar with running water. Once hardened cleaning must be carried out mechanically.

COLOUR

Grey.

CONSUMPTION

- Used neat: approx. 21 kg/m² per cm of thickness.
- Used as concrete made up of 65 parts of **Mapegrout SV-HP Fiber** and 35 parts of gravel (s.s.d. condition): approx. 14.5 kg/m² per cm of thickness (approx. 7.8 kg/m² of **Gravel 6-10**).

PACKAGING

25 kg polyethylene bags.

STORAGE

Mapegrout SV-HP Fiber, may be stored for 12 months in its original packaging in a dry place.

This product complies with the prescriptions of Reg. (EC) N. 1907/2006 (REACH) - Annex XVII, item 47.

The special 25 kg vacuum-packed polyethylene bags may be stored outside for the entire duration of the site. Rain has no effect on its characteristics.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapegrout SV-HP Fiber contains cement that when in contact with sweat or other body fluids causes irritant alkaline reactions and allergic reactions to those predisposed. It can cause damage to eyes. During use wear protective gloves and goggles and to take the usual precautions for handling chemicals. If the product comes in contact with the 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.

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

TECHNICAL DATA (typical values)

PRODUCT IDENTITY

Class according to EN 1504-3:	R4
Type:	CC
Consistency:	powder
Colour:	grey
Maximum size of aggregate (mm):	2.5
Bulk density (kg/m³):	1.350
Dry solids content (%):	100
Ion chloride content: 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:	100 parts of Mapegrout SV-HP Fiber with 12 – 13 parts of water (approx. 3.0-3.25 litres of water per 25 kg bag)
Consistency of mix:	fluid
Flow according to 13395/1 (mm):	216
Density of mix (kg/m³):	2.350
pH of mix:	> 12.5
Recommended application temperature range:	from -5°C to +35°C
Application temperature:	+5°C +10°C +20°C
Pot life of mix:	60 minutes 20 minutes 10 minutes
Time for complete setting:	100 minutes 60 minutes 35 minutes

FINAL PERFORMANCE (12.5% mixing water)

Performance characteristic	Test method	Requirements according to EN 1504-3 for R4-class mortar	Performance of product			
			-5°C (*)	0°C	+20°C	
Compressive strength (MPa):	EN 12190	≥ 45 (after 28 days)	3 hours	> 8	> 15	> 30
			4 hours	> 12	> 20	> 45
			8 hours	> 25	> 30	> 55
			1 day	> 55	> 60	> 65
			7 days	> 65	> 70	> 80
			28 days	> 75	> 80	> 95
Flexural strength (MPa):	EN 196-1	not required	> 15 (after 1 day at +20°C) > 20 (after 7 days at +20°C) > 25 (after 28 days at +20°C)			
Compressive modulus of elasticity (GPa):	EN 13412	≥ 20 (after 28 days)	30 (after 28 days)			
Adhesion to 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)			
Resistance to accelerated carbonation:	EN 13295	depth of carbonation ≤ reference concrete (type MC 0.45, water/cement ratio = 0.45) according to UNI 1766	meets specifications			
Capillary absorption (kg/m²·h^{0.5}):	EN 13057	≤ 0.5	< 0.1			
Thermal compatibility measured as adhesion according to EN 1542 (MPa): – freeze-thaw cycles with de-icing salts: – storm cycles: – dry heat cycles:	EN 13687-1 EN 13687-2 EN 13687-4	≥ 2 (after 50 cycles) ≥ 2 (after 30 cycles) ≥ 2 (after 30 cycles)	> 2 > 2 > 2			
Slip-resistance of rebar – bonding stress - (MPa):	RILEM-CEB-FIP RC6-78	not required	> 25			
Impermeability to water – penetration depth - (mm):	EN 12390/8	not required	< 5			
Crack resistance:	“O-ring” test	not required	no cracks after 180 days			
Toughness: – load at first cracking: – toughness index:	ASTM C1018	not required	> 20 kN I ₂₀ > 20			
Reaction to fire:	EN 13501-1	Euroclass	A1			

(*) Mechanical properties at -5°C refer to mixes made by conditioning the product, water and formwork at +5°C followed by curing at -5°C.

Composition and characteristics of concrete made from Mapegrout SV-HP Fiber Composition of mix: 65 parts of Mapegrout SV-HP Fiber - 35 parts of Gravel 6-10 - 12.5 parts of water							
Performance characteristic	Test method	Performance of product					
Density of mix (kg/m ³):	EN 12350-6	2,400					
Compressive strength (MPa):	EN 12190-3	3 hours	4 hours	8 hours	1 day	7 days	28 days
		> 30	> 40	> 50	> 65	> 70	> 75

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

LEGAL NOTICE

The contents of this Technical Data Sheet ("TDS") may be copied into another project-related document, but the resulting document shall not supplement or replace requirements per the TDS in force at the time of the MAPEI product installation.

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

ANY ALTERATION TO THE WORDING OR REQUIREMENTS CONTAINED OR DERIVED FROM THIS TDS EXCLUDES THE RESPONSIBILITY OF MAPEI.

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