MAPEI

IN COMPLIANCE WITH EUROPEAN STANDARD
EN 1504-6
MAPEI
ANCHORING MORTAR

Mapefill R

CE
EN 1504-6



Expansive, quick-hardening fluid mortar for fastening purposes

WHERE TO USE
Precise anchoring of machinery and metallic structures.

Some application examples
- Anchoring machine tools by pouring under bedding.
- Anchoring of metallic structures.
- Filling rigid joints between concrete elements and precast concrete.
- Underwall, etc. applications.

TECHNICAL CHARACTERISTICS
Mapefill R is a pre-blended mortar in powder form, made from high-strength cement, graded aggregates and special admixtures, including an expansive agent, according to a formula developed in MAPEI's own research laboratories.

When **Mapefill R** is mixed with water, it becomes a fluid mortar without segregation which has the property of flowing even into intricate spaces.

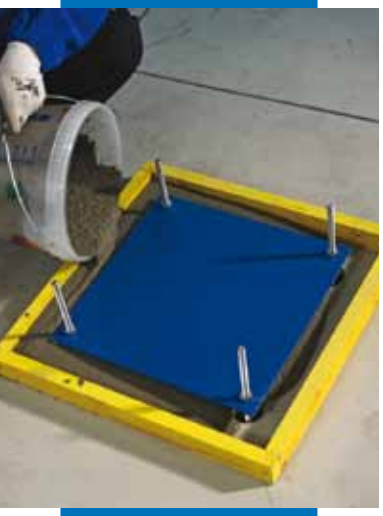
Thanks to the special expansive agent, **Mapefill R** is characterised by a total absence of shrinkage in both the plastic phase (ASTM 827 norm standards) and the hardened phase (UNI 8147 norm standards) develops extremely high levels of flexural and compressive strength, even after short periods.

Mapefill R also has the following properties:
- highly impermeable to water;
- excellent bond to steel and concrete;
- excellent resistance to mechanical stresses, including dynamic stresses;
- modulus of elasticity and coefficient of thermal expansion similar to those of medium-quality concrete;
- **Mapefill R** does not contain metallic aggregates or powdered aluminium.

Mapefill R meets all the main requirements for 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 1504-6 ("*Anchoring steel reinforcement*").

RECOMMENDATIONS
- Do not use **Mapefill R** for repairing structures by casting into formwork (use **Mapegrout Hi-Flow**).
- Do not use **Mapefill R** for vertical applications by spraying or with a trowel (use **Mapegrout Thixotropic**).
- Do not add cement or admixtures to **Mapefill R**.
- Do not add water once the mix has started to set.
- Do not use **Mapefill R** if the bag is damaged or if it has been opened before.

Mapefill R



Pouring Mapefill R



Completed grouting of anchor bolts with Mapefill R

- Do not apply **Mapefill R** if the temperature is lower than +5°C.

APPLICATION PROCEDURE

Preparation of the substrate

- Remove deteriorated concrete and any areas which are at risk of detachment, until a sound, strong substrate is obtained.
- Roughen the surface and completely remove all traces of dust, oil, grease, rubble and surface cement laitance.
- Saturate the sides of the cavities to be filled with water. Before pouring, wait until all excess water has evaporated off. If necessary, compressed air or a sponge may be used to remove free-standing water.

Preparation of the mortar

Pour 4.25-4.5 litres of water into a cement mixer. Turn the cement mixer on and slowly and continuously add **Mapefill R**. Mix for 1-2 minutes, remove all the powder which has not blended with the mix from the sides of the mixer and continue mixing for 2-3 minutes, until a fluid, lump-free blend is obtained. Either a mortar mixer or a drill equipped with a mixing attachment may be used according to the amount of material to be prepared. In this case, make sure air is not entrapped in the mix. We do not recommend mixing the mortar by hand.

Application

Pour **Mapefill R** from one side in a continuous flow, making sure that air comes out of the areas to be filled, which must be at least twice the size of the bars to be anchored. The use of **Mapefill R** to connect precast concrete elements and for filling rigid joints is recommended for thicknesses of up to 60 mm. It is not necessary to vibrate the mortar. To make filling of tight or intricate spaces easier, help the flow of cement with wooden slats or steel rods.

Addition of gravel

If cavities larger than those indicated require filling, add 30% by weight of **Gravel 6-10**. Because some characteristics may vary such as workability or strength, we recommend carrying out preliminary tests on site or contacting our Technical Services Department.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

- No special precautions need to be taken when the temperature is around +20°C.
- In hot weather, do not expose the material to the sun and use cold water to prepare the mix.
- In cold weather, use water at a temperature of approximately +20°C.
- After pouring, **Mapefill R** must be cured carefully. The surface of the mortar exposed to the air must be protected against quick evaporation of the water, which could cause the formation of surface cracks due to plastic shrinkage, especially in hot weather and windy days.
- Spray water on the surface exposed to the air for the first 24 hours of hardening, or spread on a suitable anti-evaporation product.

Cleaning

The mortar may be removed from tools using water before it hardens. Once set, it is difficult to remove the mortar and cleaning must be carried out using mechanical means.

CONSUMPTION

1.95 kg/dm^3 of cavities to be filled.

PACKAGING

25 kg bags.

STORAGE

Mapefill R may be stored for up to 12 months in its original packaging.
The product complies with the conditions of Annex XVII to Regulation (EC) N° 1907/2006 (REACH), item 47.
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.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapefill R 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.

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	
Type:	CC
Consistency:	powder
Colour:	grey
Maximum aggregate size (mm):	2.5
Bulk density (kg/m³):	1,300
Dry solids content (%):	100
Chloride ions 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 **Mapefill R** with 17-18 parts water (4.25-4.5 l per 25 kg bag)
Slip value of mortar according to EN 13395-2 (cm):	> 45
Density of the mix (kg/m³):	2,250
pH of the mix:	> 12.5
Application temperature range:	from +5°C to +35°C
Pot life of the mix:	approx. 45 minutes

FINAL PERFORMANCE (17.5% blending water)

Performance characteristic	Test method	Requirements according to EN 1504-6	Product performance
Compressive strength (MPa):	EN 12190	> 80% of the value declared by the manufacturer	32 (after 1 day) 50 (after 7 days) 62 (after 28 days)
Flexural strength (MPa):	EN 196/1	not required	5 (after 1 day) 7 (after 7 days) 8 (after 28 days)
Modulus of elasticity in compression (GPa):	EN 13412	not required	26 (after 28 days)
Bond strength to concrete (MC 0.40 type substrate - water/cement ratio = 0.40) according to EN 1766 (MPa):	EN 1542	not required	≥ 2 (after 28 days)
Contrasted expansion after 24 h (µm/m):	UNI 8147	not required	> 400
Impermeability to water - penetration depth - (mm):	EN 12390/8	not required	< 5
Free expansion in the plastic phase (%):	ASTM 827	not required	≥ 0.3
Drawing resistance of the steel rods - movement under a 75 kN load (mm):	EN 1881	≤ 0.6	< 0.6
Adherence tension of rods anchored with Mapefill R (MPa):	RILEM-CEB-FIP RC6-78	not required	> 25
Reaction to fire:	EN 13501-1	Euroclass	A1, $A1_{fl}$



Mapefill R

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