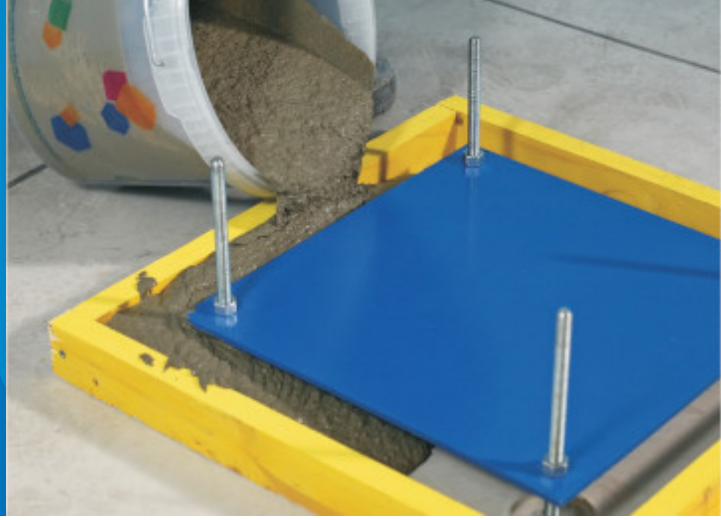
MAPEFILL R

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 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 940 standards) and the hardened phase (UNI 8147 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 evaluation of conformity. General principles for the use of products and systems*") and the minimum requirements for EN 1504-6 ("*Anchoring of reinforcing steel bar*").

RECOMMENDATIONS

- Do not use **Mapefill R** for repairing structures by casting into formwork (use **Mapegrout Hi-Flow Zero**).
- Do not use **Mapefill R** for vertical applications by spraying or with a trowel (use **Mapegrout Thixotropic Zero**).

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

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR THE APPLICATION	
Composition of the mix:	100 kg of **Mapefill R** 17-18 kg of water
Maximum thickness:	60 mm
Application temperature range:	surrounding and substrate temperature from +5°C to +35°C
Pot life of mix:	approx. 45 minutes (at +20°C)

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

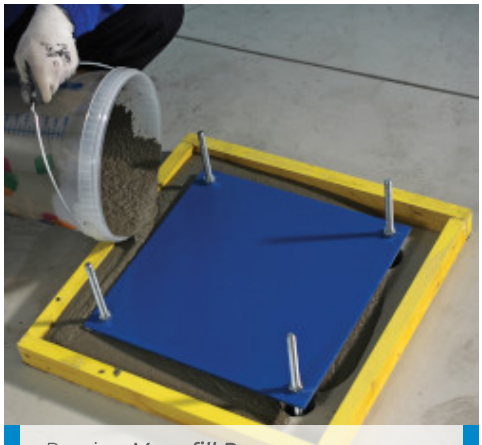
Pour 4.25-4.5 litres of water into a cement mixer. Turn the cement mixer on and slowly and continuously add **Mapefill R**. Mix for 1-2 minutes, remove all the powder which has not blended with the mix from the sides of the mixer and continue mixing for 2-3 minutes, until a fluid, lump-free blend is 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. Mixing by hand is not recommended.
Instructions for the preparation of mortar for Lab testing samples can be found in the TECHNICAL DATA section.

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.



*Pouring **Mapefill R***

*Completed grouting of anchor bolts with **Mapefill R***

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 mechanically.

CONSUMPTION

1.95 kg/dm³ 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 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

Instructions for the safe use of our products can be found on the latest version of the SDS available from our website www.mapei.com
PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY	
Consistency:	powder
Colour:	grey
Maximum size of aggregate:	2.5 mm
Ion-chloride content according to EN 1015-17 (minimum requirement according to EN 1504 ≤ 0.05%):	≤ 0.05 %

TECHNICAL INFORMATION FOR PRODUCT PREPARATION	
Composition of the mix:	100 parts by weight of **Mapefill Zero** with 17.5% water.
Preparation of the mix:	mix the product in compliance with the standard EN 196-1
Curing conditions:	CC according to Annex A – EN 12190

CHARACTERISTICS OF FRESH MIX (at +20°C - 50% R.H.)	
Colour of mix:	grey
Consistency of the mix:	fluid
Slip value of mortar after mixing (according to EN13395-2):	> 45 cm
Density of the mix:	2250 kg/m³

FINAL PERFORMANCE
According to curing defined in test methods

Performance characteristic	Test method	Requirements EN 1504-6	Product performance
Compressive strength: - 1 day - 7 days - 28 days	EN 12190	not required	32 MPa 50 MPa 62 MPa
Flexural strength - 1 day - 7 days - 28 days	EN 196-1	not required	5 MPa 7 MPa 8 MPa
Modulus of elasticity in compression:	EN 13412	not required	26 GPa
Adhesion to concrete by pull-off:	EN 1542	not required	≥ 2.0 MPa
Water impermeability – depth of penetration:	EN 12390-8	not required	< 5 mm
Restrained expansion (24 h):	UNI 8147 method A	not required	> 400 µm/m
Volume variation during the plastic phase:	ASTM C940	not required	≥ 0.3%
Pull-out strength of steel rebar – displacement at load of 75 kN:	EN 1881	≤ 0.6 mm	< 0.6 mm
Pull-out strength of ϕ 8 mm steel rebar – tension of adhesion t_{dm}:	EN 10080 Annex D *(in compliance with recommendation RILEM RC 6)*	not required	> 25 MPa
Reaction to fire:	EN 13501-1	Euroclass	A1, $A1_{FL}$

NOTES:
Specimen preparation: pour the mortar into the moulds filling them without compacting.

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.
The values declared in the TECHNICAL DATA table (typical values) were obtained in compliance with test methods and curing cycles defined in the technical standards referenced therein. Therefore, please note that the use of test procedures or methods other than those indicated in the table could lead to different values and that, in such cases, any liability of our company is excluded.
Please refer to the current version of the Technical Data Sheet, available from our website www.mapei.com

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