MAPEFILL HES

High early strength, rapid setting cementitious structural grout

WHERE TO USE

Precision grouting, anchoring and repair applications where rapid setting and the onset of early compressive strength gain is a requirement.

Some application examples

- Anchoring machinery/bearing pads/baseplates etc.
- Anchoring of metallic structures.
- Filling rigid joints between concrete and precast elements.
- Anchoring and grouting applications where a fast return to service is required.
- Repairing of beams and columns.

TECHNICAL CHARACTERISTICS

Mapefill HES is a pre-blended mortar in powder form, made from high-strength cement, graded aggregates and special admixtures, including expansive agents, according to a formula developed in MAPEI's own research laboratories. When **Mapefill HES** is mixed with water, it becomes a highly fluid rapid setting grout without segregation which has free-flowing properties even into intricate spaces. Thanks to the special expansive agent, **Mapefill HES** 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 early compressive strength after as little as 2 hours.
Mapefill HES 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 high-quality concrete;
- **Mapefill HES** does not contain metallic aggregates;
- low electrical resistivity.

Mapefill HES 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 HES** for vertical applications by spraying or by trowel (use **Planitop LSN R4** for example).
- Do not add cement or admixtures to **Mapefill HES**.
- Do not add water once the mix has started to set.
- Do not use **Mapefill HES** if the bag is damaged or if it has been opened before.
- Do not apply **Mapefill HES** if the temperature is lower than +5°C.

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR APPLICATION	
Composition of mix:	100 kg of **Mapefill HES** 12.5 - 13.5% L of water
Application thickness:	10 - 200 mm
Application temperature range:	surrounding temperature and substrate temperature from +5°C to +35°C
Pot life of mix (at +20°C):	15 - 20 minutes

Preparing the substrate

- Remove weak, loose, or friable concrete until the substrate is sound and suitably textured (CSP 4+). Any previous restoration work that is not soundly bonded must also be removed.
- Clean the concrete and any exposed reinforcement rods to remove all dirt, rust, laitance, grease, oil, and previously applied paints or coatings.
- Soak the prepared substrate with clean fresh water until it is saturated. Allow the excess water to drain away and make sure there is no standing water when placing the mix. If necessary, use oil-free compressed air to facilitate the removal of free water.

Preparing the mix

Pour **2.5 – 2.7 litres** (12.5 – 13.5%) of fresh water per bag into a mortar mixer. Start the mixer and slowly and continuously add **Mapefill HES**. Mix for 1-2 minutes, scraping any unmixed dry powder off the sides of the mixer and remix for a further 1 – 2 minutes and until the mix is fluid and free of lumps. Depending on the quantity being prepared, **Mapefill HES** may also be mixed in a clean container with a drill and mixing paddle. Avoid entraining air during the mixing process. Instructions for the preparation of the mortar to create samples for Lab testing are contained in the TECHNICAL DATA table.

Applying the mortar

When placing **Mapefill HES** and to ensure the efficient and complete filling of the void, pour the mix continuously and from one point ensuring air can escape the form from the opposite side.

PRECAUTIONS TO BE TAKEN DURING AND AFTER APPLICATION

In hot weather, it is advisable to prevent the material from being exposed to the sun and to use cold water for preparing the mix. When temperature is low, the water used for the mix should be around 20°C
Once poured, **Mapefill HES** must be cured very carefully. The surface of the mortar exposed to air must be protected against the rapid evaporation of water, particularly in warm and windy conditions, to prevent plastic shrinkage surface cracking. Spray water onto the surface during the first 24 hours of curing or apply a curing agent e.g. **Mapecure E30**.
The protection of concrete structures utilising **Mapefill HES** may be enhanced with **Mapelastic Guard** or **Elastocolor** protective coating systems.

CLEANING

The grout 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

Approx. 20 kg/m^2 at 10 mm thickness

PACKAGING

20 kg paper bags

TECHNICAL DATA (Typical Values)

PRODUCT IDENTITY	
Consistency:	powder
Colour:	grey
Maximum size of aggregate:	2.5 mm

TECHNICAL INFORMATION FOR THE PREPARATION OF THE PRODUCT	
Composition of mix:	100 parts in weight of **Mapefill HES** with 13% of water
Preparation of the mix:	Mixing of the product according to EN 196-1

CHARACTERISTICS OF FRESH MIX (at +20°C - 50% R.H.)	
Colour of mix:	grey
Consistency of mix:	fluid
Density of mix:	2300 kg/m^3
Setting time: **- initial** **- final**	 25 minutes 40 minutes

FINAL PERFORMANCE
According to curing defined in test methods

Performance characteristic	Test method	Performance of product
Compressive strength: **- 2 hours** **- 1 day** **- 7 days** **- 28 days**	AS 1478.2	 25 MPa 40 MPa 50 MPa >60 MPa
Flexural strength (28 days):	AS 1012.11	6 MPa
Indirect tensile strength (28 days)	AS 1012.10	4 MPa
Bond strength to substrates determined by tensile:	EN 1542	>2.0 MPa
Drying shrinkage (28 days):	AS 1478.2	<600 µm
Electrical resistivity (28 days):	T 358	25,000 Ωcm

STORAGE

Mapefill HES may be stored for up to 12 months in its original packaging. Bags must be stored off the ground and in a cool dry area.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

For further and complete information about the safe use of our product please refer to the latest version of our Safety Data Sheet available for download from our website at www.mapei.com.au.
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.au

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Mapei Australia Pty Ltd
180 Viking Drive, Wacol, Queensland, 4076
+61 7 3276 5000 www.mapei.com.au sales@mapei.com.au

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