

MAPEFILL 318

Pumpable, multi-purpose, shrinkage-compensated, cementitious grout



WHERE TO USE

Recommended for filling of voids and cavities in anchoring and concrete repair applications and for bearing pads.

Some application examples

- Anchoring of columns and posts.
- Filling of rigid joints between elements in concrete and precast concrete structures.
- Repair of concrete structures by form-and-pour or pressure grouting methods.
- Enlargement of beams and columns.
- Grouting of machine baseplates and bridge bearings.
- Execution of underpinnings.

TECHNICAL CHARACTERISTICS

Mapefill 318 is a preblended powdered grout composed of high strength cement, graded 1.2 mm aggregates and special additives with expansion agents formulated by the MAPEI research laboratories.

When mixed with water, **Mapefill 318** is transformed into a highly fluid grout with good pumping properties that able to fill narrow, intricate spaces without segregation.

Mapefill 318, due to its dual-stage expansion, is characterized by a total absence of shrinkage in the plastic and hardening phases, and develops very high early flexural and compressive strengths.

Mapefill 318 also has the following qualities:

- excellent impermeability to water;
- excellent adhesion to steel and concrete;
- excellent resistance to dynamic mechanical stress;
- modulus of elasticity and thermal expansion coefficient similar to those of high quality concrete.

Mapefill 318 meets all the main requirements defined by 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 claimed by EN 1504-6 ("Anchoring steel reinforcement").

RECOMMENDATIONS

- Do not add cement or additives to **Mapefill 318**.
- Do not add water when the mix begins to set.
- Do not use **Mapefill 318** if the bag is damaged or has already been opened.
- Do not apply **Mapefill 318** at temperatures below +5°C.

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR THE APPLICATION

Composition of the mix – Trowellable mix:	25 kg of Mapefill 318 3.25 – 3.75 kg of water
Composition of the mix – Pourable mix:	25 kg of Mapefill 318 3.75 – 4.25 kg of water
Composition of the mix – Flowable mix:	25 kg of Mapefill 318 4.25 – 4.75 kg of water
Application temperature range:	Surrounding and substrate temperature from +5°C to +40°C
Pot life of mix:	60 minutes (at +20°C)

Preparation of the concrete substrate

- Remove all deteriorated concrete down to sound substrate.
- Scarify the surface and completely remove dust, oil, grease, debris and any contaminant which may affect adhesion.
- Soak the sides of the cavity to be filled with water. Before pouring, remove all unabsorbed water. Use compressed air if necessary.

Preparing the steel substrate

Remove completely rust, oil, grease, scale and coating from the steel surface.

Preparing the grout

Pour up to 80% of the required water (see APPLICATION DATA) into a clean container and slowly add **Mapefill 318** while mixing continuously. Add the remaining water as necessary to achieve the desired mix. Mix for 1 - 2 minutes, making sure to scrape free any powder left sticking to the sides of the container. Remix for another 2 - 3 minutes until a fluid homogeneous paste is obtained. According to the quantities to be prepared, a grout mixer or a mechanical mixer can be used, paying careful attention to avoid the formation of air bubbles. Do not mix by hand. After mixing, stir gently with a spatula to remove entrapped air.

Application

In general, pour or pump **Mapefill 318** from one side only in a continuous flow to avoid the formation of voids and to facilitate the discharge of entrapped air.

- For formwork repairs, it is necessary to make breather holes for air discharge. The formwork must be water-tight and firmly supported in place.
- For large area applications, for example in machine base grouting, make sure enough material is prepared for grout placement in an uninterrupted operation. It is not necessary to vibrate the grout mechanically; to facilitate the filling of spaces that are particularly difficult, use a wooden stick, steel bar or steel chain as appropriate.

Addition of 8 - 10 mm aggregates

For filling cavities with section thicknesses greater than 60 mm, add washed 8 - 10 mm aggregates not exceeding 100% by weight of **Mapefill 318** to reduce heat build-up during the cement hydration process.

It is advisable to carry out preliminary tests at the work-site or to consult our Technical Service in order to determine the appropriate mix consistency and work method.

Instructions to be observed before and after application

- At temperature around +20°C, no particular precautions are required.
- In hot weather it is advisable not to expose the material to sun and to use cold water in preparing the mix.
- In low temperatures it is advisable to use water that is around +20°C.
- After casting, **Mapefill 318** must be properly cured; the surface of the grout exposed to air must be protected from rapid water evaporation that can cause the formation of surface cracks due to plastic shrinkage especially in hot and/or windy weather.
- Apply a curing compound such as **Mapecure SP** or cover with plastic sheets for at least 24 hours.

Cleaning

Fresh grout can be removed from tools with water. After curing, material can only be removed mechanically.

TECHNICAL DATA (typical values)

PRODUCT IDENTIFICATION DATA

Consistency:	powder
Colour:	grey
Maximum size of aggregate:	1.2 mm
Chloride ion content – minimum requirements $\leq 0.05\%$ - according to EN 1015 – 17%:	≤ 0.05

TECHNICAL INFORMATION FOR PRODUCT PREPARATION

Mixing ratio:	100 parts in weight of Mapefill 318 with 19% of water (Only for mechanical strengths: 100 parts in weight of Mapefill 318 with 16% of water)
Preparation of the mix:	While mixing, add approx. $\frac{3}{4}$ of the total amount of water. Then, add slowly the product and the remaining mixing water while continuing mixing. Mix under high shear for at least 2 minutes until a homogeneous paste without lumps is obtained.
Curing condition:	CC (according to Annex A – EN 12190)

CHARACTERISTICS OF THE FRESH MIX (at +20°C and 50% R.H.)

Colour of mix:	grey
Consistency of mix:	flowable
Flow (ASTM C939):	< 60 sec
Density of mix:	2200 kg/m ³
Bleeding:	absent
Volume change in plastic phase (ASTM C 940):	1.0%

FINAL PERFORMANCE

Performance characteristic	Test method	Requirements EN 1504-6	Product performance	
Compressive strength:			19% of water	16% of water
▪ 1 day			30 MPa	40 MPa
▪ 7 days	EN 12190	Not required	55 MPa	65 MPa
▪ 28 days			65 MPa	75 MPa
Flexural strength:			19% of water	16% of water

▪ 1 day			5 MPa	6 MPa
▪ 7 days	EN 196-1		7 MPa	8 MPa
▪ 28 days			8 MPa	9 MPa
Pull-out strength of steel rebar – displacement at load of 75 kN:	EN 1881	≤ 0.6	≤ 0.6	-
Reaction to fire:	EN 13501-1	Euroclass	A1, A1 _{FL}	-

CONSUMPTION

25 kg bag of **Mapefill 318** yields approximately:

- 13.3 - 13.5 litres of grout with 4.25 - 4.75 litres of mix water;
- 13.0 - 13.3 litres of grout with 3.75 - 4.25 litres of mix water;
- 12.8 - 13.1 litres of grout with 3.25 - 3.75 litres of mix water.

PACKAGING

Mapefill 318 is available in 25 kg bags.

STORAGE

Store in a dry, sheltered place in original, unopened packaging for 12 months.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our product can be found on the latest version of the Safety Data Sheet from our website www.mapei.com.my

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

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