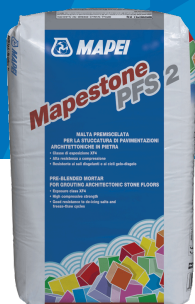


# MAPESTONE PFS 2

Pre-mixed, high-strength mortar with good resistance to de-icing salts, seawater and freeze-thaw cycles, exposure class XF4 and XS3, for grouting architectural stone paving. Available in two versions: NEUTRAL, DARK GREY and WHITE



## PRODUCT DESCRIPTION

**Mapestone PFS 2** is a pre-mixed, ready-to-use powder mortar for the grouting of joints of external natural stone paving and road finishes suitable for vehicular use.

**Mapestone PFS 2** is a complementary product of **Mapestone** system, which allows to realize architectural stone paving with high durability even in environments subject to rain, to freeze and thaw cycles in the presence of de-icing salts and seawater (environmental conditions classified by EN 206 standard as XF4 and XS3).

**Mapestone PFS 2** is available in three versions: NEUTRAL, ideal for architectural paving made with light-colored stones, DARK GREY, ideal for architectural paving made with dark stones and WHITE.

White

Dark Grey

Neutro

## WHERE TO USE

**Mapestone PFS 2** is used for grouting joints in natural stone architectural paving and road finishes: squares, roads, pavements, car-parks, pedestrian crossings, roundabouts and speed humps made from:

- small blocks/setts;
- smaller bricks;
- cobblestones;
- slabs;
- blocks.

## TECHNICAL CHARACTERISTICS

**Mapestone PFS 2** is a pre-mixed mortar in powder form, made from special binders, selected aggregates in a granulometric curve (maximum size 2 mm) and special additives.

Joints grouted with **Mapestone PFS 2** are resistant to freeze-thaw cycles (exposure class XF3), seawater (exposure class XS3) and de-icing salts (exposure class XF4), are very strong ( $C \geq 50$  MPa) and highly resistant to abrasion.

**Mapestone PFS 2** is easy to use in that it needs only to be mixed with water. This means that dosing errors for the binders and aggregates by the user are avoided, errors which would otherwise compromise the initial and final characteristics of the mortar.

## RECOMMENDATIONS

- Only apply **Mapestone PFS 2** if the temperature of the surrounding air, the substrate and the stone is between +5°C and +30°C.
- **Mapestone PFS 2** is a pre-mixed powdered mortar; never add other binders or aggregates.
- Mix **Mapestone PFS 2** mechanically using a suitable equipment (such as with a vertical concrete mixer, a mixing drill or in a bucket with a worm-screw mixing attachment) with the recommended amount of water (approximately 3.5 - 4.2 litres per sack) depending on the surrounding temperature for at least 3 minutes.
- Respect the recommended water/sack ratios in order to prevent unwanted color shifts.
- Mixing by hand is not recommended.
- Apply **Mapestone PFS 2** the same day as installing the stone paving (using the “fresh on fresh” technique), i.e. before the installation screed has completely set.
- To guarantee the durability of the paving, use **Mapestone TFB 60** pre-mixed mortar to make the installation screed for the stones.
- We recommend including expansion and perimeter joints, along kerbs, pavements, around manholes and drains, along the lines of changes in slope and along rainwater run-off troughs. A maximum pitch area of 30 m<sup>2</sup> is recommended according to UNI 11322 standard.

## APPLICATION PROCEDURE

To guarantee the durability of the paving, the substrate on which it is installed must be designed and prepared according to the stresses and loads the paving will have to withstand (e.g. a concrete floor slab with electro-welded reinforcement mesh). If existing joints have to be re-grouted, a design engineer must first make sure that the cause of deterioration (e.g. subsidence in the substrate, deterioration of the installation mortar, poor quality of the existing grouting) has been eliminated before grouting.

### Preparing the joints

- Before pouring in the mortar, the stones must be wet and the joints must be clean and free of stagnant water and any detached parts.
- Completely fill all the joints between the stone. The size of the joints depends on the size of the stone and must be at least 25 mm deep.

### Preparation of the mix

- Mix the **Mapestone PFS 2** pre-mixed mortar with 3.0 to 3.5 litres of water per sack (according to the surrounding temperature) in a vertical concrete mixer, with a mixing drill or in a bucket with a worm-screw mixing attachment for at least 3 minutes until it forms a fluid, well-blended slurry.
- Never mix the product by hand.
- Apply the mortar within 40 minutes of mixing at +20°C. At higher temperatures, workability times are considerably reduced.

### Application of the mix

- Apply the mix at a temperature of between +5°C and +30°C.
- Grout the joints the same day as installing the stone paving (using the “fresh on fresh” technique) before the installation screed has completely set.
- Spread the slurry over the damp stones with the aid of a rubber rake or pour it directly into the joints using a suitable container.
- Joints deeper than 25 mm may be filled in a single application.
- Clean the stone using conventional techniques before **Mapestone PFS 2** has completely hardened: residues of mortar may be removed by hosing down with sawdust, a light and steady jet of water or with a cleaning machine.

Protect the grout for at least 12 hours after application from:

- high temperatures, for example with jute sacks;
- rain and freezing weather, for example with non-woven fabric or sawdust under thick nylon sheets.

The grout sets to foot traffic after 12-24 hours and to vehicle traffic after just 7 days at +20°C. If the temperature is lower than +15°C, the set to foot traffic and set to vehicle traffic times are considerably longer.

## CONSUMPTION

The consumption of **Mapestone PFS 2** for installing architectural stone flooring depends on the size and thickness of the stones and the width and depth of the joints.

### Cleaning

Clean tools and stones with water before the product has completely hardened.

## PACKAGING

**Mapestone PFS 2** is supplied in 25 kg bags, and is available in three colors: PFS2 NEUTRAL, PFS 2 DARK GREY and PFS 2 WHITE.

## STORAGE

**Mapestone PFS 2** remains stable for 12 months if stored in a dry place protected from damp.

## SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Instructions for the safe use of our products can be found on the latest version of the Safety Data Sheet, available from our website [www.mapei.com](http://www.mapei.com).

PRODUCT FOR PROFESSIONAL USE.

## TECHNICAL DATA (typical values)

### PRODUCT IDENTITY

<b>Consistency:</b>	powder
<b>Colour:</b>	PFS 2: basic PFS 2 DARK GREY: dark grey PFS WHITE
<b>Maximum grain size:</b>	2 mm
<b>pH value:</b>	approximately 12 at +20°C in saturated solution
<b>Bulk density (kg/m<sup>3</sup>):</b>	approximately 1,750
<b>Modulus of elasticity:</b>	approximately 30 GPa

### APPLICATION DATA (at +20°C - 50% R.H.)

<b>Mixing ratio:</b>	3.5- 4.2 litres per bag according to surrounding temperature
<b>Bulk density of blend (kg/m<sup>3</sup>):</b>	2,000
<b>Mixing time:</b>	3 minutes
<b>Application temperature range:</b>	from +5°C to +30°C

Strength	Compressive strength (MPa)	Flexural strength (MPa)
after 1 day	15	3
after 7 days	42	5
after 28 days	50	8

## 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](http://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](http://www.mapei.com).

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



An example of small blocks in a circular pattern



Mix Mapestone PFS 2 with water only using a mixing attachment or cement mixer



Spreading the slurry on the wet stone



Small porphyry blocks laid in straight rows



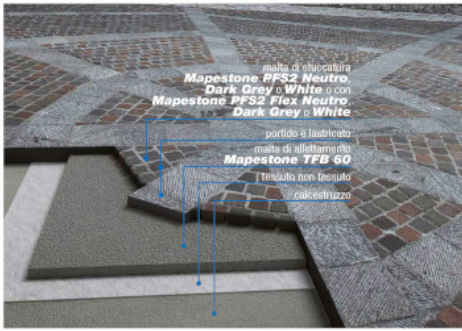
An example of how to protect the paving



An example of flooring in cobblestones, slabs and porphyry setts



An example of a piazza used as a car-park



*An example of small porphyry blocks and natural stone slabs installed using the Mapestone system*

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