



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: BASIC and DARK GREY



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 two versions: BASIC, ideal for architectural paving made with light-colored stones and DARK GREY, ideal for architectural paving made with dark stones.

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/sets;
- smoller 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 ($C \geq 55$ 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 $+5^{\circ}\text{C}$ and $+30^{\circ}\text{C}$.
- **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 3-3.5 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.

Mapestone PFS 2



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

TECHNICAL DATA (typical values)

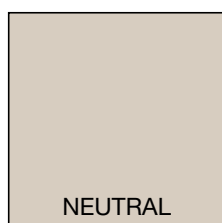
PRODUCT IDENTITY

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

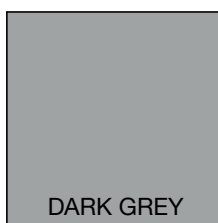
APPLICATION DATA (at +20°C - 50% R.H.)

Mixing ratio:	3.0-3.5 litres per bag according to surrounding temperature
Bulk density of blend (kg/m ³):	2,000
Mixing time:	3 minutes
Application temperature range:	from +5°C to +30°C

Strength	Compressive strength (MPa)	Flexural strength (MPa)
after 1 day	15	3
after 7 days	45	5
after 28 days	55	8



NEUTRAL



DARK GREY

Due to the printing processes involved, the colours should be taken as merely indicative of the shades of the actual products

- 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 m² 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 two colors: PFS2 BASIC and PFS 2 DARK GREY.

STORAGE

Mapestone PFS 2 remains stable for 12 months if stored in a dry place protected from damp. The product complies with the conditions of

Annex XVII to Regulation (EC) N° 1907/2006 (REACH), item 47.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapestone PFS 2 contains cement which, in contact with sweat or other body fluids, causes an irritant alkaline reaction and allergic reactions to those predisposed. It can cause damage to the eyes. During use, wear protective gloves and goggles and take the usual precautions for handling chemicals. In case of contact with the eyes or the skin, wash immediately with plenty of water and seek medical attention.

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

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.

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

All relevant references for the product are available upon request and from www.mapei.com



An example of flooring in cobblestones, slabs and porphyry setts



An example of a piazza used as a car-park



An example of small blocks in a circular pattern

Mapestone PFS 2



An example of how to protect the paving



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