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# MAPELASTIC SMART

Two-component, high-flexibility cementitious mortar (with crack-bridging > 2 mm), applied by trowel or with a roller, for waterproofing balconies, terraces, bathrooms and swimming pools.



## WHERE TO USE

**Mapelastic Smart** is used for waterproofing hydraulic projects such as channels, faces of dams, swimming pools, basins, storage tanks, etc. and balconies and terraces.

Particularly suitable for waterproofing irregular surfaces.

**Mapelastic Smart** is also used to protect concrete structures, renders with hairline cracks and cementitious surfaces in general which, being subject to vibrations, may suffer from cracking.

### Some application examples

- Waterproofing hydraulic channels, faces of dams and basins.
- Waterproofing bathrooms, showers, balconies, terraces, swimming pools etc. before laying ceramic tiles.
- Waterproofing plasterboard, render or cementitious surfaces.
- Flexible protection layer of new concrete structures or repaired structures subject to minor deformation under load.
- Protection of cementitious renders or concrete with cracks due to shrinkage, minor movement caused by thermal gradients or dynamic stresses due to the passage of vehicles, against infiltration of water and aggressive elements from the atmosphere.
- Protection of concrete pillars and beams and road and railway viaducts repaired with products from the **Mapegrout** or **Planitop** ranges against the penetration of carbon dioxide.
- Protection of concrete surfaces which may come into contact with sea water, de-icing salts, such as sodium or calcium chloride, and sulphates.

## ADVANTAGES

- High performance: a 2 mm thick film can cover cracks up to 2 mm wide.
- Excellent mechanical characteristics thanks to the use of **Mapetex Sel N** reinforcement.
- CE-certified and UKCA certified product in compliance with EN 1504-2 and EN 14891.
- Excellent elongation at failure (120%).
- Fluid consistency for easy application.
- Resistant to UV rays.
- May also be applied on existing coverings.
- Compatible with ceramic, mosaic and natural stone coverings.
- Product certified ECI Plus by the GEV Institute (Gemeinschaft Emissions-kontrollierte Verlegewerkstoffe, e.V.) as a product with very low emission of volatile organic compounds.

## TECHNICAL CHARACTERISTICS

**Mapelastic Smart** is a two-component mortar based on cementitious binders, fine-grained selected aggregates, special admixtures and synthetic polymers in water dispersion, blended according to a formula developed in MAPEI's own research laboratories. When the two components are mixed, a blend with a plastic consistency is obtained. It may be applied by brush, by roller or by spraying with a worm screw rendering machine on both horizontal and vertical surfaces at a thickness of approximately 2 mm. Due to the content and high quality of the synthetic resins, the hardened layer of **Mapelastic Smart** remains constantly flexible under all environmental conditions.

**Mapelastic Smart** is waterproof and resistant to the penetration of aggressive substances which are present in the atmosphere, such as carbon dioxide, sulphur dioxide and sulphuric anhydride, and soluble salts such as chlorides and sulphates, which are present in seawater or in the ground.

**Mapelastic Smart** has excellent bonding properties on all cementitious, ceramic and marble surfaces as long as they are sound and sufficiently clean. These properties, together with its resistance to the deteriorating effect of UV rays, a characteristic of this product, ensure that structures protected and waterproofed with **Mapelastic Smart** have a long service life, even if they are located in areas with particularly rigid climatic conditions, in coastal areas with a saline-rich atmosphere or in industrial areas where the air is particularly polluted.

**Mapelastic Smart** meets the requirements defined by 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 requirements claimed by EN 1504-2 coating (C) according to the PI, MC and IR principles ("*Protection systems for concrete surfaces*").

## RECOMMENDATIONS

- Do not apply **Mapelastic Smart** at temperatures lower than +8°C.
- Do not add cement, aggregates or water to **Mapelastic Smart**.
- Protect from rain and water spillages for the first 24 hours after application.
- Do not leave **Mapelastic Smart** exposed in swimming pools.
- Do not apply on lightweight substrates.
- Do not apply on cementitious substrates not sufficiently cured.
- During hot weather, it is advisable to keep the product out of direct sunlight before use (powder and liquid).
- After application, and in particularly dry, hot or windy weather, we recommend that the surface is protected from rapid evaporation with sheets.
- Not suitable for Negative Pressure, look at **Mapelastic Foundation**.

## APPLICATION PROCEDURE

### Preparation of the substrate

#### A) Protection and waterproofing of concrete structures and elements.

(eg. pillars and beams for road and railway viaducts, cooling towers, chimneys, underpasses, retaining walls, applications in coastal areas, basins, channels, faces of dams, columns, faces of balconies, skirt roofs, etc.)

The surface to be treated must be sound and perfectly clean. Remove all cement laitance, flaky parts and traces of powder, grease, oil and removing compounds by sand-blasting or washing down with high-pressure water.

If the structure to be waterproofed and protected with **Mapelastic Smart** is in a poor condition, remove the damaged parts by hand or mechanical means, or by using a water jet blasting which uses high pressure water and is particularly recommended, because the reinforcement rods are not damaged and the structures are not subject to vibration which could cause hairline cracks to form in adjacent concrete.

Once the rust has been completely removed by sandblasting, carry out the repair with a ready-mixed mortar from the **Mapegrout** or **Planitop** range.

Absorbent surfaces to be treated with **Mapelastic Smart** must be slightly dampened beforehand with water.

#### B) Waterproofing of terraces, balconies and swimming pools

##### · CEMENTITIOUS SCREEDS:

- settlement cracks caused by plastic or hygrometric shrinkage must be sealed beforehand with **Eporip**;
- if thicknesses of up to 20 mm have to be levelled out (to create slopes, fill out dips, etc.) use **Adesilex P4** or **Planitop Fast 330**.

##### · EXISTING FLOORS:

- existing floors and coverings in ceramic, gres, klinker or terracotta etc. must be well bonded to the substrate and free from substances which could compromise the quality of the bond, such as grease, oil, wax, paint, etc.

To remove all traces of material that could affect the adhesion of **Mapelastic Smart**, clean existing floors with a mixture of water and 30% caustic soda and thoroughly rinse the floor with water to eliminate all traces of caustic soda.

##### · RENDERS:

- new, cementitious-based renders or lime-cement renders must be well cured (in good weather, we recommend at least 7 days per cm of thickness applied), bonded to the substrate, resistant and free of powder or all kinds of paint;
- dampen absorbent surfaces to be treated beforehand with water.

### Waterproofing: attention to detail

In the waterproofing sector, more than in any other sector, it is essential to pay particular attention to details, which alone are capable of making a difference. This is why it is essential to use products from the **Mapeband** and **Drain** ranges in combination with **Mapelastic Smart**.

**Mapeband TPE** is used to seal structural joints, gaps and interruptions subject to high dynamic stress, while **Mapeband**, **Mapeband Easy** and **Mapeband SA** are used to waterproof fillet joints between horizontal and vertical surfaces and check joints.

Special kits are also available from the **Drain** range to seal drainage points.

It is absolutely imperative that special care is in these critical areas after evening out and cleaning the substrate and before applying the cementitious waterproofing mortar.

## Preparation of the mortar

Pour component B (liquid) into a suitable, clean container. Then slowly add component A (powder) while stirring with a mechanical mixer.

Carefully mix **Mapelastich Smart** for a few minutes, making sure that no powder remains stuck to the sides or the bottom of the container.

If required allow to stand while removing any powder from the sides of the container.

Keep stirring until a perfectly homogenous mix is obtained.

Use a low-speed mechanical mixer for this operation to avoid too much air entering the mix.

Do not prepare the mix by hand. Preparation of **Mapelastich Smart** may also be carried out with a mortar mixer, which is usually supplied with mortar sprayers.

If this technique is used, make sure that the mix is homogenous and has no lumps before it is poured into the hopper of the pump.

## Manual application of the mortar

**Mapelastich Smart** must be applied in at least two coats by trowel or with a roller within 60 minutes of it being mixed, to give a final thickness of at least 2 mm.

When used for waterproofing terraces, balconies, basins and swimming pools, and for protecting substrates which have hairline cracks or elements which are particularly stressed, we recommend to embed **Mapenet 150** alkali-resistant glass fibre mesh in the first layer of fresh **Mapelastich Smart**, to act as a reinforcement.

After the mesh has been laid, finish the surface with a flat trowel and apply a second layer of **Mapelastich Smart** when the first one has set (after 4-5 hours). To further improve elongation at failure and crack-bridging of **Mapelastich Smart** on horizontal surfaces, we recommend inserting **Mapetex Sel N** non-woven macro-holed polypropylene fabric.

The first layer of **Mapelastich Smart** must be at least 1 mm thick. While it is still fresh, carefully lay **Mapetex Sel N** on the surface, and press it in using a flat-bladed trowel to make sure that it is perfectly buttered. Then apply the second coat of **Mapelastich Smart** to completely cover the fabric, and smooth over the surface using a flat-bladed trowel.

After applying **Mapelastich Smart**, wait at least 5 days for curing before laying ceramic tiles and a further 15 days before filling the pool. This waiting time can be longer in cold climatic conditions.

In good weather and at normal temperatures, on the other hand, this time may be reduced to 24 hours for dry substrates.

## Laying ceramic tiles on Mapelastich Smart

· BALCONIES AND TERRACES:

· Bond in place with a C2 class cementitious adhesive such as **Keraflex** or **Keraflex Maxi S1** or, for more rapid interventions, a C2F class adhesive such as **Granirapid** or **Ultralite S1 Quick**;

· Grout all joints with a CG2 class cementitious product such as **Keracolor FF** or **Keracolor GG** mixed with **Fugolastic** or **Ultracolor Plus**;

· Seal all expansion joints with a specific MAPEI flexible sealant (such as **Mapeflex PU 45 FT**, **Mapeflex AC** or **Mapesil LM**. Other types of sealant may be recommended, depending on specific service conditions. Please contact MAPEI Technical Services Department).

· SWIMMING POOLS:

· Bond ceramic tiles with a C2 class cementitious adhesive (**Keraflex** or **Keraflex Maxi S1**) or a C2F class rapid adhesive (**Granirapid** or **Ultralite S1 Quick**). For mosaic use **Adesilex P10+Isolastic** mixed with 50% water (class C2ES1);

· Grout all joints with a CG2 class cementitious product (**Keracolor FF/Keracolor SF** mixed with **Fugolastic** or **Ultracolor Plus**) or with an RG class epoxy product (from the **Kerapoxy** range);

· Seal all joints with **Mapesil AC** silicone sealant.

## Application of the mortar by spraying

After preparing the surface (refer to "Preparation of the substrate" section) spray on at least two layers of **Mapelastich Smart** at a thickness of at least 1 mm per layer with a rendering machine fitted with a spraying lance for smoothing and levelling compound in order to form a final layer at least 2 mm thick.

Successive coats must only be applied when the previous one is dry (after 4-5 hours).

In areas with hairline cracks or which are highly stressed, insertion of **Mapenet 150** in the first layer of fresh **Mapelastich Smart** is recommended.

Immediately after laying the mesh, **Mapelastich Smart** must be smoothed with a flat trowel. To ensure the mesh is totally encapsulated, a further layer of **Mapelastich Smart** may be applied with a spray gun.

To further improve elongation at failure and crack-bridging of **Mapelastich Smart** on horizontal surfaces, we recommend inserting **Mapetex Sel N** non-woven macro-holed polypropylene fabric. The first layer of **Mapelastich Smart** must be at least 1 mm thick. While it is still fresh, carefully lay the **Mapetex Sel N** on the surface, and press it in using a flat-bladed trowel to make sure that it is perfectly buttered. Then apply the second coat of **Mapelastich Smart** to completely cover the fabric, and smooth over the surface using a flat-bladed trowel.

If **Mapelastich Smart** is used, for protecting bridge piles and beams, railway underpasses or façades on buildings etc., the product may be painted over using products from the **Elastocolor** range, acrylic resin-based paint in water dispersion available in a wide array of colours obtained using the **ColorMap**® automatic colouring system.

If **Mapelastich Smart** is used for protecting horizontal concrete surfaces not for pedestrian use such as on flat roofs, the product may be painted over with **Elastocolor Waterproof** flexible acrylic resin-based paint in water dispersion.

Elastocolor Waterproof is available in a wide range of colours obtained using the ColorMap® automatic colouring system and must be applied at least 20 days after applying Mapelastic Smart.

## CLEANING

Due to the high bonding strength of Mapelastic Smart, even on metals, we recommend that work tools are washed with water before the mortar sets. Once it has set, cleaning may only be carried out by mechanical means.

## CONSUMPTION

### Application by trowel or roller:

Approx. 1.6 kg/m<sup>2</sup> per mm of thickness.

### Spray gun application:

Approx. 2.2 kg/m<sup>2</sup> per mm of thickness.

**N.B.:** the consumption figures indicated are for a seamless film on a flat surface and are higher if applied on uneven substrates.

## PACKAGING

Units of 30 kg:

component A: 20 kg bags;

component B: 10 kg drums.

## STORAGE

Mapelastic Smart component A may be stored for up to 12 months when contained in its original sealed packaging in a dry place.

Mapelastic Smart component B may be stored for up to 24 months.

Store Mapelastic Smart in a dry place and at a temperature of at least +5°C.

## 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.co.uk](http://www.mapei.co.uk).

PRODUCT FOR PROFESSIONAL USE.

**Mapelastic Smart: two-component flexible cementitious membrane for waterproofing balconies, terraces, bathrooms and swimming-pools, and for protecting concrete in compliance with the requirements of EN 14891 (CM01P) and EN 1504-2, coating (C) principles PI, MC and IR**

### TECHNICAL DATA (typical values)

### PRODUCT IDENTITY

	comp. A	comp. B
Consistency:	powder	liquid
Colour:	grey	white
Bulk density (g/cm <sup>3</sup> ):	1.4	–
Density (g/cm <sup>3</sup> ):	–	1.0
Dry solids content (%):	100	53

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

Colour of mix:	grey
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Mixing ratio:	component A : component B = 2 : 1		
Consistency of mix:	fluid, may be applied by brush		
Density of mix (kg/m <sup>3</sup> ):	1,600		
Density after application by spray (kg/m <sup>3</sup> ):	2,200		
Application temperature range:	from +8°C to +40°C		
Pot life of mix:	1 hour		
EMICODE:	EC1 Plus - very low emission		
<b>FINAL PERFORMANCE (thickness 2.0 mm)</b>			
Performance characteristic	Test method	Requirements according to EN 1504-2 coating (C) principles PI, MC and IR	Performance figures for Mapelastick Smart
Adhesion to concrete - after 28 days at +20°C and 50% R.H. (N/mm <sup>2</sup> ):	EN 1542	for flexible systems with no traffic: ≥ 0.8 with traffic: ≥ 1.5	1.3
Adhesion to concrete - after 7 days at +20°C and 50% R.H. + 21 days in water (N/mm <sup>2</sup> ):		not required	0.9
Thermal compatibility measured as adhesion according to EN 1542 (MPa): - freeze-thaw cycles with de-icing salts after storm cycles	EN 13687-1 EN 13687-2	for flexible systems with no traffic : ≥ 0.8 with traffic : ≥ 1.5	0.9
Elasticity expressed as elongation - after 28 days at +20°C and 50% R.H. (%):	DIN 53504 modified	not required	120
Static crack-bridging at +20°C expressed as maximum crack width - after 28 days at +20°C and 50% R.H. (mm):	EN 1062-7	from class A1 (0.1 mm) to class A5 (2.5 mm)	class A5 (+20°C) (> 2.5 mm)
Dynamic crack-bridging at +20°C expressed as resistance to cracking cycles:		from class B1 to class B4.2	class B4.2 (+20°C) No failure of the test piece after 20,000 crack cycles with movement of crack from 0.20 to 0.50 mm
Permeability to water vapour - equivalent air thickness S <sub>D</sub> (m):	EN ISO 7783	Class I (S <sub>D</sub> < 5 m) Class II (5 m < S <sub>D</sub> < 50 m) Class III (S <sub>D</sub> > 50 m)	Class I (permeable to water vapour)
			S <sub>D</sub> = 3.6      μ = 1800
Impermeability to water, expressed as capillary absorption (kg/m <sup>2</sup> ·h <sup>0.5</sup> ):	EN 1062-3	< 0.1	< 0.05
Permeability to carbon dioxide (CO <sub>2</sub> ) - diffusion in equivalent air layer thickness S <sub>DCO2</sub> (m):	EN 1062-6	> 50	> 50
Reaction to fire:	EN 13501-1	Euroclass	E
		<b>Requirements according to EN 14891</b>	<b>Performance figures for Mapelastick Smart</b>
Impermeability to water under pressure (1.5 bar for 7 days of positive lift):	EN 14891-A.7	no penetration	no penetration
Crack-bridging ability at +23°C (mm):	EN 14891-A.8.2	≥ 0.75	2.8

Crack-bridging ability at -5°C (mm):	EN 14891-A.8.3	≥ 0.75	0.8
Initial adhesion strength (N/mm <sup>2</sup> ):	EN 14891-A.6.2	≥ 0.5	1.1
Adhesion after immersion in water (N/mm <sup>2</sup> ):	EN 14891-A.6.3	≥ 0.5	0.65
Adhesion after application of heat source (N/mm <sup>2</sup> ):	EN 14891-A.6.5	≥ 0.5	1.3
Adhesion after freeze-thaw cycles (N/mm <sup>2</sup> ):	EN 14891-A.6.6	≥ 0.5	0.7
Adhesion after immersion in basic water (N/mm <sup>2</sup> ):	EN 14891-A.6.9	≥ 0.5	0.7
Adhesion after immersion in chlorinate water (N/mm <sup>2</sup> ):	EN 14891-A.6.8	≥ 0.5	0.7

Adhesion values according to EN 14891 measured on **Mapelastic Smart** and C2-type cementitious adhesive in compliance with EN 12004



Waterproofing of details by roller



Waterproofing of details by brush



Waterproofing of terraces by trowel

## 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.co.uk](http://www.mapei.co.uk)

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