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





BENEFITS AND FEATURES

- 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-marked product according to EN 1504-2 and EN 14891 standards.
- Excellent elongation at failure (120%).
- Fluid consistency for easy application.
- Can also be applied on existing coverings.
- The product is certified EC1 Plus by the GEV Institute (Gemeinschaft Emissions-kontrollierte Verlegewerkstoffe, e.V.) as a product with very low emission of volatile organic compounds.

WHERE TO USE

Mapelastic Smart is used for waterproofing hydraulic structures such as channels, faces of dams, swimming pools, basins, storage tanks, etc. as well as balconies and terraces. It is 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, could suffer from cracking.

Some application examples

- Waterproofing hydraulic channels, dam faces, and basins.
- Waterproofing bathrooms, showers, balconies, terraces, swimming pools, etc. before laying ceramic tiles.
- Waterproofing of plasterboard, render or cementitious surfaces, lightweight cement blocks and marine plywood.
- 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 temperature variations or dynamic stresses due to the passage of vehicles, against water ingress 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 structures with an inadequate concrete cover of the reinforcement rods against the penetration of aggressive elements.
- Protecting concrete surfaces that come into contact with seawater, de-icing salts such as sodium chloride and calcium and sulphate salts.

TECHNICAL CHARACTERISTICS

Mapelastic Smart is a two-component, flexible, mortar made of cementitious binders, fine-grained selected aggregates, special additives, and synthetic polymers in water dispersion according to a formula developed in the MAPEI Research & Development Laboratories.

When the two components are mixed together, they form a mix with plastic consistency that can be applied by brush, roller, or spray with a worm screw rendering machine on both horizontal and vertical surfaces with a thickness of approximately 2 mm. Thanks to the high content of synthetic resins and to their quality, the hardened layer of **Mapelastic Smart** is highly flexible. This feature remains unaffected in all weather conditions.

Mapelastic Smart is watertight and resistant to the penetration of aggressive substances, which are present in the atmosphere, such as carbon dioxide, sulfur dioxide and sulfur trioxide, and soluble salts such as chlorides and sulfates, which are present in seawater or in the ground.

Mapelastic Smart also has excellent adhesion on all concrete, ceramic, and marble surfaces, provided they are sound and sufficiently clean. These properties, together with its excellent resistance to U.V. rays, ensure that structures protected with **Mapelastic Smart** are durable, even when located in areas with particularly cold climatic conditions, in coastal areas with a saline-rich atmosphere or in industrial areas where the air is highly polluted.

Mapelastic Smart complies with the principles defined in 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 minimum requirements of EN 1504-2 coating (C) according to principles PI, MC, and IR ("Surface protection systems for concrete").

RECOMMENDATIONS

- Do not apply **Mapelastic Smart** if the temperature is lower than +8°C.
- Do not add cement, aggregates, or water to **Mapelastic Smart**.
- Protect from rain and accidental spillages of water for the first 24 hours after application.
- Do not leave **Mapelastic Smar**t exposed in swimming pools.
- Do not apply Mapelastic Turbo on lightweight substrates.
- Do not apply on cementitious substrates not sufficiently cured.
- In hot weather, we recommend avoiding exposure of the material to the sun before use (powder and liquid).
- In particularly dry, warm, or windy weather, protect the surface with sheets after applying the product to prevent rapid evaporation.

APPLICATION PROCEDURE

TECHNICAL INFORMATION FOR PRODUCT PREPARATION	
Mixing ratio:	component A : component B = 2 : 1 (one 20 kg bag of component A with one 10 kg jerrycan of component B)
Thickness applied:	final thickness of at least 2 mm *(make reference to the paragraph "Application of the mortar")*
Application temperature:	Surrounding and substrate temperature from +8°C to +40°C
Density:	1600 kg/m^3 (for manual application) 2200 kg/m^3 (for spray application)
Pot life of mix:	60 mins. (at +20°C)

Preparation of the substrate

A) Protection and waterproofing of concrete structures and elements

(for ex. 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, stringcourses, etc.).

The surface to be treated must be sound and perfectly clean. Remove cement laitance, loose and crumbling parts, and traces of dust, and grease, and form release agents with sandblasting or high-pressure water jet.

For waterproofing damaged concrete structures with **Mapelastic Smart**, remove all the deteriorated parts using manual or power tools, or by hydrodemolition or hydroscarification.

The last two techniques require the use of high-pressure water. They are particularly recommended because they do not damage the reinforcing steel and structures are not subjected to vibrations that could provoke the formation of micro-cracking in the surrounding 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 products for balconies, terraces, and swimming pools

- *CEMENTITIOUS SCREED:*
  - seal cracks caused by settling of the screed or hygrometric shrinkage with **Eporip**;
  - to integrate layers up to 3 cm thick (such as to create slopes or fill hollows, etc.) use **Planitop Fast 330** or **Adesilex P4**.
- *EXISTING FLOORS:*
  - existing floors and coverings in ceramic, gres, clinker or terracotta, etc. must be well bonded to the substrate and must be completely free of substances that could affect adhesion, such as grease, oil, wax, varnish, etc.
  - To remove any traces of material that may compromise the adhesion of **Mapelastic Smart**, wash the existing flooring with **UltraCare HD Cleaner**, then rinse the flooring thoroughly with water only to remove any residue.
- *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), bonded to the substrate, resistant and free from dust or any kind of paint;
  - dampen absorbent surfaces to be treated beforehand with water.

Waterproofing features

In the waterproofing sector, more than in any other sector, it is essential that particular attention is paid to construction features, that alone can make a difference. For this reason, it is important to use products from the **Mapeband** and **Drain** ranges together with **Mapelastic Smart** when waterproofing such features.

Mapeband TPE is used to seal structural joints and all other breaks in the covering that are subjected to important dynamic stress, while **Mapeband**, **Mapeband Easy,** and **Mapeband SA** are used to waterproof fillet joints between horizontal and vertical elements and contraction joints. Special kits are also available from the **Drain** range to seal drainage points.

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

Preparation of the mortar

Pour component B (liquid) in a suitable clean container, then slowly add component A (powder) while mixing.

Accurately stir **Mapelastic Smart** for a few minutes, carefully removing all traces of dust from the sides and the bottom of the container.

Keep mixing until a completely blended mix is obtained.

A mechanical mixer at low speed is recommended for this operation, to prevent entraining too much air into the mix.

Avoid mixing the product manually.

Mapelastic Smart can also be prepared with a mixer, usually provided with a concrete mixer.

It is recommended to check the mortar is evenly mixed and that there are no lumps before pouring it into the hopper of the pump.

The instructions for the preparation of the mortar to be used for the creation of concrete samples for laboratory tests are reported in the Technical Data table.

Application of the mortar

Mapelastic Smart must be applied with a roller, a trowel, or by spray with a rendering machine within 60 minutes after mixing in at least two coats, to give a final thickness of at least 2 mm.

For waterproofing balconies, terraces, basins, swimming pools, and areas with micro-cracks or that are particularly stressed, we recommend embedding **Mapenet 150**, alkali-resistant, glass fibre reinforcing mesh, in the first layer of **Mapelastic Smart** while it is still wet, to reinforce the mortar.

After embedding the mesh, apply the second layer of **Mapelastic Smart** when the first layer has hardened (after 4-5 hours). To further improve the extension at elongation at break and crack-bridging properties of **Mapelastic Smart** on horizontal surfaces, we recommend using **Mapetex Sel N** non-woven polypropylene fabric. On the first coat of **Mapelastic Smart**, while still wet and at least 1 mm thick, apply **Mapetex Sel N** pressing down on it with the flat side of the trowel so that it is completely embedded. Then apply a second layer of **Mapelastic Smart** so that the fabric is completely embedded, and finish the surface with a flat trowel.

After applying **Mapelastic Smart**, wait at least 5 days for curing before laying ceramic tiles. This waiting time can be longer in cold weather.

In good weather and at the right temperature, and with a dry substrate, this period may be reduced to 24 hours.

Application of ceramic tiles on Mapelastic Smart

BALCONIES AND TERRACES:

- Use minimum C2 class adhesives to be selected depending on the format of the tiles, such as **Keraflex**, **Ultraflex S1 2K, Keraflex Maxi S1,** or **Ultralite S1 Flex,** alternatively use C2F class adhesives, such as **Keraquick Maxi S1, Ultralite S1 Flex Quick, Ultralite S2 Flex Quick**, or **Elastorapid** for rapid bonding work and at low temperatures.
- Grout the joints with cementitious products with minimum CG2 class, such as **Ultracolor Plus** or **Keracolor FF**, **Keracolor GG** mixed with **Fugolastic**.
- Seal joints with a specific MAPEI flexible sealant (such as **Mapeflex PU45 FT**, **Mapesil AC, Mapesil AC,** or **Mapesil LM**. Other types of sealant may be required, depending on specific service conditions. Please contact MAPEI Technical Services Department).

SWIMMING POOLS:

- Use minimum C2 class adhesives to be selected depending on the format of the tiles, such as **Keraflex**, **Keraflex Maxi S1,** or **Ultralite S1 Flex**, alternatively minimum C2F class rapid adhesives, such as **Keraquick Maxi S1, Ultralite S1 Flex Quick, Ultralite S2 Flex Quick**, or **Elastorapid**. For mosaic, use **Ultralite S1 Flex** or **Adesilex P10** + **Isolastic** mixed with 50% water (class C2ES1).
- Grout the joints with a CG2 class cementitious product (**Ultracolor Plus** or **Keracolor FF**/**Keracolor GG** mixed with **Fugolastic**) or with an RG class epoxy product from the **Kerapoxy** range.
- Seal the joints with. **Mapesil AC** or **Mapesil AC** silicone sealant.

Applying the mortar by spray

After preparing the surface (see "Preparation of the substrate" paragraph, apply **Mapelastic Smart** by spraying with a rendering machine fitted with a lance for finishing skimming coat, in at least 2 coats with a max. thickness of approx. 1 mm per coat, so that the final film thickness is at least 2 mm

Apply successive layers when the previous layer has dried (after 4-5 hours).

In areas with micro-cracks or that are particularly stressed, we recommend embedding **Mapenet 150** in the first layer of **Mapelastic Smart** while still fresh.

Smooth over the **Mapelastic Smart** with a flat trowel immediately after embedding the mesh. If the mesh needs to be covered even more, apply another layer of **Mapelastic Smart** by spray. oT further improve the extension at elongation at break and crack-bridging properties of **Mapelastic Smart** on horizontal surfaces, we recommend using **Mapetex Sel N** non-woven polypropylene fabric. On the first coat of **Mapelastic Smart**, while still wet and at least 1 mm thick, apply **Mapetex Sel N** pressing down on it with the flat side of the trowel so that it is completely embedded. Then apply a second layer of **Mapelastic Smart** so that the fabric is completely embedded and finish the surface with a flat trowel.

If **Mapelastic 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 **Mapelastic 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**.



Waterproofing of terraces by roller



Waterproofing of details by brush



Waterproofing of terraces by trowel

CLEANING

Due to the high adhesion of **Mapelastic Smart** even on metal, it is advisable to wash working tools with water before the mortar starts to set. Once hardened, cleaning can be carried out only mechanically.

CONSUMPTION

Application by trowel or roller

approx. 1.6 kg/m^2 per mm of thickness.

Spray application using a rendering machine:

approx. 2.2 kg/m2 per mm of thickness

Note: *the consumption rates are calculated on the basis of a seamless film on a flat surface, and they will be higher on uneven substrates.*

PACKAGING

30 kg unit:

component A: 20 kg bag

component B: 10 kg jerrycan

Upon request: light colour component A in 20 kg bag

STORAGE

Mapelastic Smart component A can be stored for 12 months in its original packaging in a dry area.

Mapelastic Smart component B can be stored for 24 months.

Store **Mapelastic Smart** in a dry place 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.it.

PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

PRODUCT IDENTITY Identification according to EN 1504-2 (methods and principles) Coating (C) – principles PI, MC and IR		
	Component A	**Component B**
Consistency:	powder	liquid
Colour:	grey	white
EMICODE:	EC1 Plus – very low emission	

PREPARATION OF SAMPLES FOR LABORATORY TESTS	
Mixing ratio:	component A : component B = 2 : 1
Preparation of mix:	mix with a low speed mixer for approx. 1 minute and 30 seconds until an even mix with the declared density is obtained

CHARACTERISTICS OF FRESH MIX (at +20°C - 50% R.H.)	
Colour of mix:	grey
Consistency of mix:	fluid-brushable
Density of mix:	1600 kg/m³

FINAL PERFORMANCE Curing at +23°C – 50% R.H. unless otherwise specified by the test methods (Thickness applied 2.0 mm)			
Performance characteristic	**Test method**	**Requirements EN 1504-2 (C) PI, MC and IR**	**Performance of product**

Bond strength to concrete by pull-off:	EN 1542	flexible systems without traffic ≥ 0.8 MPa	**1.3 MPa**
Thermal compatibility - freeze/thaw cycles with de-icing salts (50 cycles) following storm cycles (10 cycles)	EN 13687-1 EN 13687-2	flexible systems without traffic ≥ 0.8 MPa	**0.9 MPa**
Bond strength to concrete by pull-off (after 7 days at +20 °C and 50% R.H. and 7 days in water):	EN 1542	not required	**0.9 MPa**
Elasticity expressed as elongation (after 28 days at +20°C and 50% R.H.):	DIN 53504 mod.	not required	**120 %**
Static crack-bridging at +23°C after conditioning according to EN 1062-11 § 4.1 - 7 days at +70 °C:	EN 1062-7 Method A	from class A1 (0.1 mm) to class A5 (2.5 mm)	**Classe A5 (+23°C) (> 2.5 mm)**
Dynamic crack-bridging at 23°C after conditioning according to EN 1062-11 § 4.1 - 7 days at +70 °C:	EN 1062-7 Method B	from class B1 to class B4.2	**class B4.2 (23°C)** no failure of test sample after 20000 cracking cycles with movements in the crack from 0.2 to 0.50 mm)
Water-vapour permeability (wet-cup - method B) expressed as equivalent air-layer thickness S_d:	EN ISO 7783	Class I S_d < 5 m Class II 5 m ≤ S_d ≤ 50 m Class III S_d > 50 m	**S_d < 5 m Class I** *(permeable to water vapour)*
Impermeability expressed as coefficient of permeability to liquid water(W):	EN 1062-3	W < 0.1 kg/m²·$h^{0.5}$	***W* < 0.05 kg/m²·$h^{0.5}$** Class W_3 *(low permeability to water) according to EN 1602-1*
Permeability to carbon dioxide (CO2) – diffusion in equivalent air layer thickness S_D:	EN 1062-6 method B	S_D > 50 m	**S_D > 50 m**
Reaction to fire:	EN 13501-1	Euroclass	**E**

Performance characteristic	Test method	Requirements EN 14891 CM O1 P	Performance of product
Imperto water in pressure:	EN 14891-A.7	no penetration	**no penetration**
Crack-bridging ability at +23°C:	EN 14891-A.8.2	≥ 0.75 mm	**2.8 mm**
Crack-bridging ability at low temperature -5°C:	EN 14891-A.8.3	≥ 0.75 mm	**0.8 mm**
Initial tensile adhesion strength:	EN 14891-A.6.2	≥ 0.5 N/mm²	**1.1 N/mm²**
Tensile adhesion strength after water contact:	EN 14891-A.6.3	≥ 0.5 N/mm²	**0.65 N/mm²**
Tensile adhesion strength after heat ageing*:	EN 14891-A.6.5	≥ 0.5 N/mm²	**1.3 N/mm²**
Tensile adhesion strength after freeze-thaw cycles*:	EN 14891-A.6.6	≥ 0.5 N/mm²	**0.7 N/mm²**
Tensile adhesion strength after contact with lime water*:	EN 14891-A.6.9	≥ 0.5 N/mm²	**0.7 N/mm²**
Tensile adhesion strength after contact with chlorinated water*:	EN 14891-A.6.8	≥ 0.5 N/mm²	**0.7 N/mm²**

** Tensile adhesion strength values determined with **Mapelastic Smart** and type C2FTES2 cementitious adhesive in compliance with EN 12004*

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.

Please refer to the current version of the technical data sheet, available from our website www.mapei.com
www.mapei.com

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