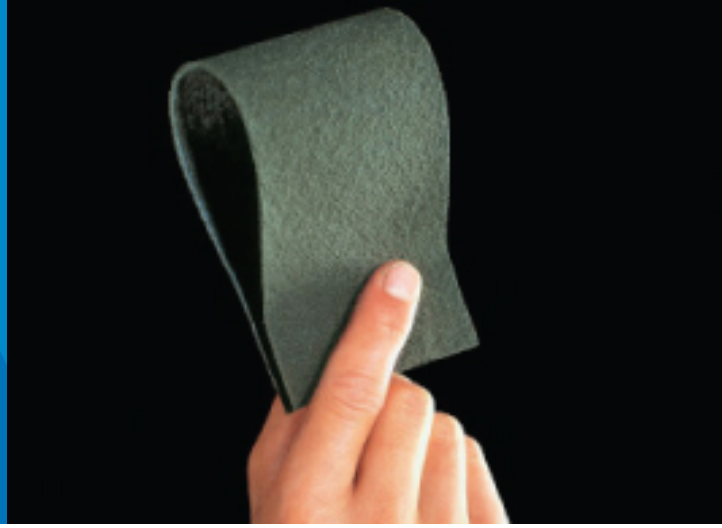
MAPELASTIC

Two-component, flexible cementitious mortar for waterproofing balconies, terraces, bathrooms and swimming pools



WHERE TO USE

Waterproofing and protection of concrete structures, renders, and cementitious screeds.

Some application examples

- Waterproofing of water retaining structures
- Waterproofing bathrooms, showers, balconies, terraces, swimming pools, etc. before laying ceramic tile finishes
- Waterproofing of plasterboard, render or cementitious surfaces, lightweight cement blocks, and marine-grade plywood
- Flexible smoothing layer for light-sectioned concrete structures, including those subject to minor deformation when under load (e.g. pre-cast panels)
- Protection of renders or concrete surfaces with cracks caused by shrinkage, against the infiltration of water and aggressive atmospheric elements
- Protection against the penetration of carbon dioxide of concrete elements, road and railway viaducts plus additional protection to structures repaired with products from the **Mapegrout** range. Particularly suitable for structures with an insufficient layer of concrete cover to the reinforcement
- Protection of concrete surfaces in contact with seawater, de-icing salts, such as sodium or calcium chloride and sulfates

TECHNICAL CHARACTERISTICS

Mapelastic is a two-component coating based on cementitious binders, fine-grained selected aggregates, special additives, and synthetic polymers dispersed in water, blended according to a formula developed in MAPEI's own research laboratories. When the two components are mixed together, a free-flowing mix is obtained which may be easily applied, even on vertical surfaces, at a thickness of up to 2 mm in one single coat.
Due to the high content and quality of the synthetic resins used, the cured layer of **Mapelastic** remains constantly flexible under all environmental conditions and furthermore, is completely waterproof up to a pressure of 1.5 bar and remains resistant to the chemical attack of deicing salts, sulfates, chlorides, and carbon dioxide.
Mapelastic has excellent bonding properties to all concrete, masonry, ceramic and marble surfaces, as long as they are sound and sufficiently clean.
In addition, its resistance to the deteriorating effect of UV ensures that structures protected and waterproofed with **Mapelastic** have a long service life, even in areas with particularly aggressive climatic conditions, such as highly saline coastal areas or in industrial areas where the air is particularly polluted.

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

RECOMMENDATIONS

- Do not use **Mapelastic** for thick coating applications (more than 2 mm per coat).
- Do not apply **Mapelastic** at temperatures below +8°C.
- Do not add cement, aggregates, or water to **Mapelastic.**
- Protect from rain and water spillage for the first 24 hours after application.

For large terraces and flat roofs where **Mapelastic** is to be applied or for substrates that are particularly absorbent, such as foamed concrete, polystyrene modified mortar, or foamed clay, please consult your local MAPEI technical representative for full detailing.

APPLICATION PROCEDURE

Preparation of the substrate

A) Protection and waterproofing of concrete structures and pre-cast units

(e.g. pillars and beams for road and railway viaducts, cooling towers, chimneys, underpasses, retaining walls, applications in coastal areas, basins, swimming pools, canals, faces of dams, columns, balconies). The surface to be treated must be sound and all loose or degraded concrete should be removed. Where necessary clean the concrete and any exposed reinforcing steel by sweep blasting or other approved mechanical means, to remove all dirt, any corrosion products, cement, laitance, grease, oil, and any other deleterious materials. The reinforcing steel, when cleaned should be protected using **Mapefer** or **Mapefer 1K**. Should repairs be required these should be carried out using products from the **Mapegrout** or **Planitop** range of MAPEI repair materials before application of **Mapelastic**.
Surfaces to be coated with **Mapelastic** must be dampened beforehand with potable grade water to achieve a saturated surface dry condition (SSD).

B) Waterproofing terraces, balconies, and swimming pools

• CEMENTITIOUS SCREEDS:
– Cracks caused by plastic or hygrometric shrinkage must be repaired beforehand with **Eporip**;
– if thicknesses of up to 3 cm need to be leveled (to create slopes, filling undulations, etc.) use **Planitop Fast 330.**

• EXISTING FLOORS:
– existing floors and coverings in ceramic, porcelain tiles, clinker or terracotta, etc. must be well bonded to the substrate and free of substances that could compromise the bonding, such as grease, oil, wax, paint, etc.

• RENDERS:
– cementitious renders must be sufficiently cured (7 days per cm of thickness in good weather conditions), well bonded to the substrate, resistant and free from all dust and paint.
– dampen absorbent surfaces to be coated with potable grade water (SSD condition).

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 **Mapelastic** for a few minutes, making sure that no powder remains stuck to the sides or the bottom of the container. Keep stirring until a perfectly homogenous mix is obtained.
Use a low-speed mechanical mixer for this operation to avoid air entrainment. Do not prepare the mix by hand.
Preparation of **Mapelastic** 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

Mapelastic must be applied within 60 minutes of mixing.
Smooth off the prepared surface by applying a thin layer of **Mapelastic** with a smooth trowel. Apply a second coat on top of this first coat when it has set (typically 4-5 hours) to achieve a final thickness not less than 2mm.
When used for waterproofing terraces, balconies, basins and swimming pools, it is recommended to insert a layer of **Mapenet 150**, alkaline resistant fibre glass mesh in the first layer of fresh **Mapelastic**, to act as reinforcement (see **Mapenet 150** technical data sheet).
After the mesh has been applied, finish off the surface with a flat trowel and apply a second coat of **Mapelastic** when the first coat has set (typically after 4-5 hours).
During waterproofing operations take special care when operating around expansion joints and joints between horizontal and vertical surfaces, where **Mapeband**, tape with alkali resistant felt, or **Mapeband TPE**, tape made from thermoplastic polymers and synthetic elastomers, must be used.
Special kits from the MAPEI Drain range are used to seal drains and pipe penetrations prior to applying the cementitious waterproofing coating. (Please seek advice from your local MAPEI technical representative).
After applying **Mapelastic**, wait 5 days for curing before laying ceramic tiles.

Laying ceramic tiles on Mapelastic

• **BALCONIES AND SWIMMING POOLS:**
– lay the tiles with MAPEI cementitious adhesives and leave wide joints. In swimming pools, use **Granirapid** (class C2F S1), **Elastorapid** (class C2FTE S2) or **Kerabond T** + **Isolastic** (class C2 S2). If mosaics are laid, **Adesilex P10** + **Isolastic** mixed with 50% water may also be used (class C2TE S1).
– grout the joints between the tiles with a suitable cementitious grout (for example **Keracolor FF** (class CG2 WA), **Keracolor GG** (class CG2 WA) mixed with **Fugolastic**, **Ultracolor Plus** - (class CG2 WA) or epoxy resin (for example **Kerapoxy** - class RG).
– seal expansion joints with a suitable flexible sealant from the MAPEI range (such as **Mapeflex PU21**, **Mapeflex PU20**, **Mapeflex PU50 SL**, **Mapeflex PU45**, **Mapeflex PU40** or **Mapesil AC**, according to requirements).

Spray application of the coating

After preparing the surface (refer to “Preparation of the substrate” section) spray on at least two coats of **Mapelastic** at a thickness of at least 1mm per coat with a rendering machine fitted with a spraying lance. Smooth and level the applied material to form a final thickness of at least 2 mm thick.
Successive coats must only be applied when the previous coat is dry (typically after 4-5 hours).

Special consideration to detailing of expansion joints, construction joints, all penetrations and at changes of direction (vertical and horizontal) using either **Mapeband**, tape with alkali[1]resistant felt, or **Mapeband TPE**, tape made from thermoplastic polymers and synthetic elastomers (further technical recommendation can be obtained from your local MAPEI technical representative).

If **Mapelastic** is used for protecting stacks and joists on bridges, railway underpasses and façades on buildings, etc. the product may be painted using products from the **Elastocolor** range, which are acrylic resin-based water dispersion and are available in a wide range of colours which may be obtained using the **ColorMap®** automatic colouring system.

If **Mapelastic** is used, on horizontal concrete surfaces not for pedestrian use such as on flat roofs, the product may be over-coated with **Elastocolor Waterproof** flexible acrylic resin, based on paint in water dispersion (refer to the technical data sheet for **Elastocolor** Waterproof). **Elastocolor** Waterproof is available in a wide range of colours obtained using the **ColorMap®** automatic colouring system and must be applied at least 15 days after applying **Mapelastic.**

Precautions to be taken during and after application

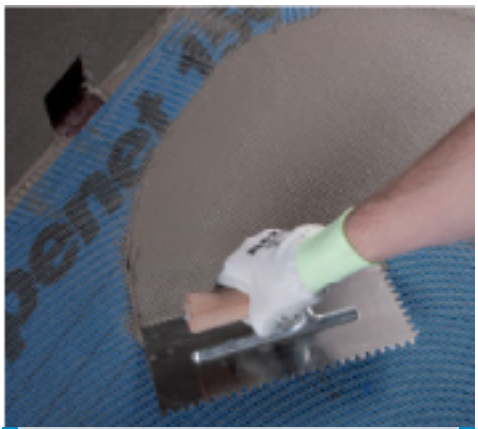
- No special precautions need to be taken when the temperature is around +20°C
- During hot weather, it is advisable to keep the product out of direct sunlight (powder and liquid)
- After application, and in particularly dry, hot or windy weather, it is recommended to protect the surface from rapid evaporation

Waterproofing screeds with Mapelastic and Mapeband

Installing ceramic with Kerabond T + Isolastic

Private terrace, Cereseto (Alessandria) - Italy

Application of Drain Vertical on Mapelastic

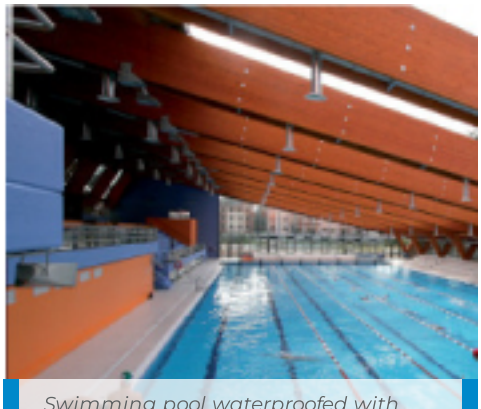


Laying Mapelastic on Mapenet 150

Laying Granirapid on a terrace waterproofed with Mapelastic

Waterproofing a swimming pool with Mapelastic

Laying ceramic tiles on Mapelastic in a swimming pool



Swimming pool waterproofed with Mapelastic: Scarioni Leisure Centre - Milan - Italy

Example of Mapelastic applied on a viaduct by spraying

TECHNICAL PERFORMANCE DATA

The technical data table contains the identification and application data for the product.

Figures 1, 2, 3, 4, and 5 illustrate some of **Mapelastic's** characteristics.
Figure 1 shows the load diagram for evaluating the product's crack-bridging capacity. The sample which **Mapelastic** was applied is on the underside of the beam, which is subjected to increasing loads in the middle. The crack-bridging capacity of **Mapelastic** is determined by measuring the maximum load at moment **Mapelastic** fractures. The degree of protection offered by **Mapelastic** to the concrete substrate is not limited to a simple "covering" of subsequent cracks provoked by heavy loads, shrinkage, temperature variations etc. **Mapelastic** itself is also very resistant to chemical attack, as illustrated by the results of the following tests, and offers good protection for the concrete against carbonation and therefore, subsequent corrosion of the reinforcing steel.

Figure 2 is a graph that compares accelerated carbonation (in an atmosphere of air enriched with 30% of CO_2), and shows how **Mapelastic** is completely impermeable to this aggressive substance. The **Mapelastic** coating also protects the concrete from the attack of sodium chloride for example seawater.

Figure 3 shows how **Mapelastic** completely blocks infiltration of salt into the concrete which is, in itself, very porous and may be easily penetrated. **Mapelastic** also provides an impenetrable barrier against calcium chloride ($CaCl_2$) based de-

icing salts, which have a destructive action on even the highest quality concrete.

Figure 4 shows the reduction in mechanical resistance (initially 65 N/mm²) of concrete permanently immersed in a solution of 30% CaCl2. In this case, too, **Mapelastic** offers efficient protection of the concrete and prevents the salt from carrying out its aggressive and destructive action on the concrete.

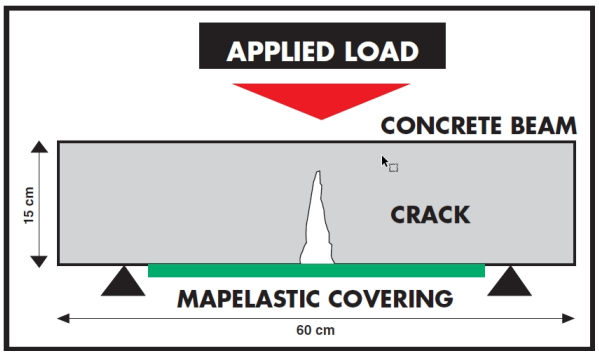


Fig. 1: Protection of a hairline crack to a concrete beam subject to flexural stress, coated with Mapelastic to the underside

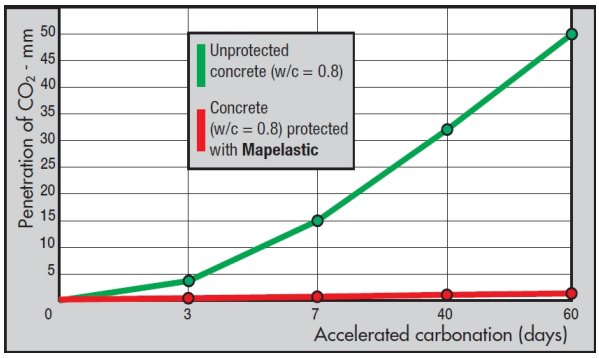


Fig. 2: Protection of porous concrete with Mapelastic against accelerated carbonation (30% of CO2)

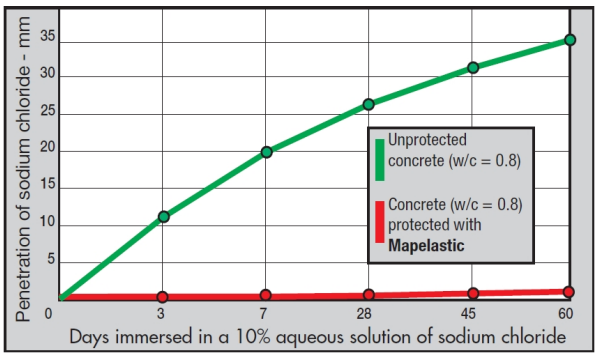


Fig. 3: Protection of porous concrete with Mapelastic against penetration of sodium chloride

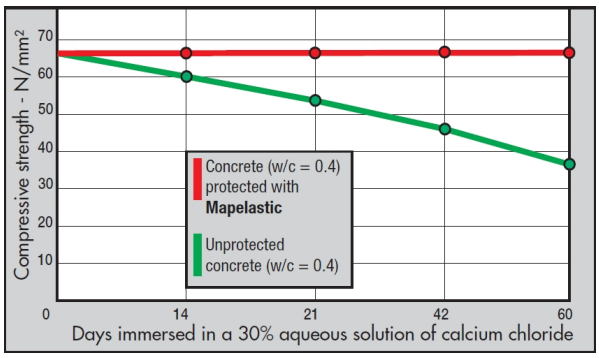


Fig. 4: Protection of concrete with Mapelastic against the decrease in mechanical strength caused by calcium chloride based de-icing salts

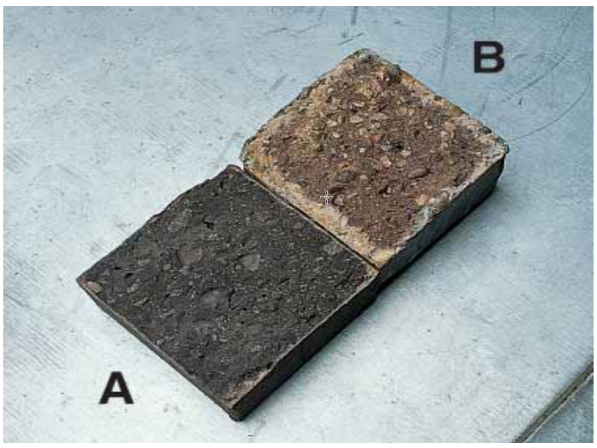


Fig. 2B - Penetration test of chloride ions (UNI 9944). Sample A coated with Mapelastic shows no penetration; sample B, left uncoated, shows significant chloride penetration

CLEANING

Due to the high bonding strength of **Mapelastic**, even on metals, it is recommended to wash work tools with water before the mortar sets. Once it has been set, cleaning may only be carried out by mechanical means.

CONSUMPTION

Manual application: approx. 1.7 kg/m² per mm of thickness.
Spray gun application: approx. 2.2 kg/m² per mm of thickness.

PACKAGING

Units of 32 kg:
component A: 24 kg bags.
component B: 8 kg drums.

STORAGE

When stored in dry conditions in the original, unopened bags, **Mapelastic** component A has a shelf life of 12 months. If stored at high temperature and or high humidity, the shelf life may be reduced.
Mapelastic component B when kept in the original unopened packaging may be stored for up to 24 months. Store **Mapelastic** in a dry place and at a temperature of at least +5°C.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION

Mapelastic component A contains cement which, in contact with sweat or other body fluids, produces an irritant alkaline reaction and allergic reaction to those predisposed. Wear protective gloves and goggles. For further and complete information about the safe use of our product please refer to our latest version of the Material Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

Mapelastic : *two-component flexible cementitious membrane for waterproofing balconies, terraces, bathrooms, swimming pools and for protecting concrete in compliance with the requirements of EN 14891 and EN 1504-2, EN 1504-9 coating (C) principles PI, MC and IR*		
TECHNICAL DATA (typical values)		
PRODUCT IDENTIFICATION		
	Component A	Component B
Consistency:	powder	liquid
Colour:	grey	white
Bulk density (g/cm³):	1.4	-
Density (g/cm³):	-	1.1
Dry solids content (%):	100	50
APPLICATION DATA OF PRODUCT (at +20°C - 50% R.H.)		
Colour of mix:	grey	
Mixing ratio:	component A : component B = 3 : 1	
Consistency of mix:	plastic, trowellable	
Density of mix (kg/m³):	1700	
Density after application by spray (kg/m³):	2200	
Application temperature range:	from +5°C to +40°C	
Pot life of mix:	1 hour	
FINAL PERFORMANCE (thickness 2.0 mm)		
	Acceptable limit according to EN 1504-2 coating (C) (PI, MC and IR principles)	Performance figures for Mapelastic

Bond strength to concrete according to EN 1542: – after 28 days at +20°C and 50% R.H. (N/mm²):	For flexible systems with no traffic: ≥ 0.8 with traffic: ≥ 1.5	1.0	
Thermal compatibility to freeze/thaw cycles with de-icing salts, measured as bond strength according to EN 1542 (N/mm²):		0.8	
Bond strength to concrete according to EN 1542: – after 7 days at +20°C and 50% R.H. + 21 days in water (N/mm²):	not applicable	0.6	
Flexibility according to DIN 53504 mod, expressed as elongation: – after 28 days at +20°C and 50% R.H. (%):	not applicable	30	
Static crack-bridging at -20°C according to EN 1062-7 expressed as maximum width of the crack (mm):	from class A1 (0.1 mm) to class A5 (2.5 mm	class A3 (-20°C) (> 0.5 mm)	
Dynamic crack-bridging at -20°C according to EN 1062-7 of a film of Mapelastic reinforced with Mapetex Sel, expressed as resistance to cracking cycles:	from class B1 to class B4.2	class B3.1 (-20°C) No failure of the test piece after 1,000 crack cycles with movement of crack from 0.10 to 0.30 mm	
Permeability to water vapour according to EN ISO 7783-1: - equivalent thickness of air SD (m):	class I: SD < 5 m (permeable to vapour)	S_D	μ
		2.4	1,200
Impermeability to water, expressed as capillary absorption according to EN 1062-3 (kg/m²·h0.5):	< 0.1	< 0.05	
Permeability to carbon dioxide (CO2) according to EN 1062-6 - diffusion in an equivalent thickness of air SDCO (m):	> 50	> 50	
Reaction to fire (Euroclass):	According to class declared by manufacturer	C, s1 - d0	
	Acceptable limit according to EN 14891	**Performance figures for Mapelastic**	
Impermeability to water under pressure according to EN 14891-A.7 (1.5 bar for 7 days of positive lift):	no penetration	no penetration	
Crack-bridging ability at +20°C according to EN 14891-A.8.2 (mm):	> 0.75	0.9	
Crack-bridging ability at -20°C according to EN 14891-A.8.3 (mm):	> 0.75	0.8	
Initial bond strength according to EN 14891-A.6.2 (N/mm²):	> 0.5	0.8	
Bond strength after immersion in water according to EN 14891-A.6.3 (N/mm²):	> 0.5	0.55	
Bond strength after application of heat source according to EN 14891-A.6.5 (N/mm²):	> 0.5	1.2	
Bond strength after freeze-thaw cycles according to EN 14891-A.6.6 (N/mm²):	> 0.5	0.6	
Bond strength after immersion in basic water according to EN 14891-A.6.9 (N/mm²):	> 0.5	0.6	

Bond values according to EN 14891 were measured using **Mapelastic** and a C2F-type cementitious adhesive according to EN 12004 and ISO 13007.

WARNING

Although the technical details and recommendations contained in this product datasheet 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.

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

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