

# Mapelastic

**Two-component, flexible cementitious mortar for the protection and waterproofing of concrete surfaces, balconies, terraces, bathrooms and swimming pools**



## WHERE TO USE

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

### Some application examples

- Waterproofing of concrete basins used for containing water.
- 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.
- Waterproofing retaining walls or pre-cast concrete elements embedded in the ground.
- Flexible smoothing layer for light-sectioned concrete structures, including those subjected to small deformations when under load (e.g. pre-cast panels).
- Protection of renders or concrete with cracks caused by shrinkage, against the infiltration of water and aggressive atmospheric elements.
- Protection, against the penetration of carbon dioxide, of concrete pillars and joists and road and railway viaducts repaired with products from the **Mapegrout** range, and structures with an insufficient layer of concrete covering on the reinforcement rods.

- Protection of concrete surfaces which may come into contact with seawater, de-icing salts, such as sodium or calcium chloride, and sulphates.

## TECHNICAL CHARACTERISTICS

**Mapelastic** is a two-component mortar based on cementitious binders, fine-grained selected aggregates, special additives and synthetic polymers in water dispersion, 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.

Thanks to the high content and quality of the synthetic resins, the hardened layer of **Mapelastic** remains constantly flexible under all environmental conditions and, what is more, is completely waterproof up to a pressure of 1.5 bar and resistant to the chemical attack of de-icing salts, sulphates, chlorides and carbon dioxide.

**Mapelastic** has excellent bonding properties on all concrete, masonry, ceramic and marble surfaces, as long as they are solid and sufficiently clean.

These properties mean that structures protected and waterproofed with **Mapelastic** are hardwearing, even under particularly adverse climatic conditions, in coastal areas with a high salt content in the atmosphere or in industrial areas where the air is particularly polluted.

# Mapelastic



Mixing of Mapelastic with a mechanical mixer



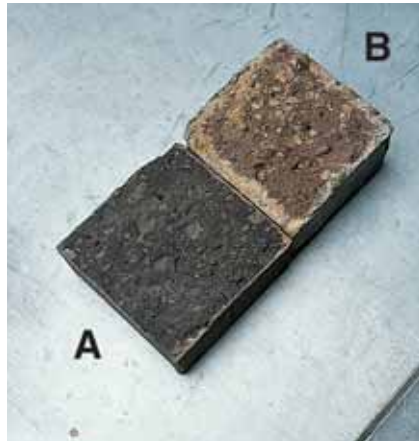
Waterproofing a balcony with Mapelastic incorporating a fibreglass net reinforcement



Setting tiles with Granirapid onto a balcony waterproofed with Mapelastic

## RECOMMENDATIONS

- Do not use **Mapelastic** for thick dressings (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 the application.
- When **Mapelastic** is used on large terraces or flat roofs that will not be covered with tiles, vapour vents must be appropriately positioned



Penetration test of chloride ions (UNI 9944). Sample A covered with Mapelastic is not penetrated; sample B, left uncoated, shows an advanced penetration of many mm

according to the level of humidity in the substrate (generally every 20-25 m<sup>2</sup>).

This operation is indispensable when **Mapelastic** is laid on substrates which are particularly absorbent, such as screeds which have been lightened with polystyrene or foamed clay.

## APPLICATION PROCEDURE

### Preparation of the substrate

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

(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, balcony fronts). The surface to be treated must be solid and perfectly clean.

Remove all cement laitance, flaky parts and traces of powder, grease, oil and form release agents by sand-blasting, or wash down with high-pressure water jets.

If the structure to be waterproofed and protected with **Mapelastic** is in poor condition, remove the damaged parts by hand or mechanical abrasion or by

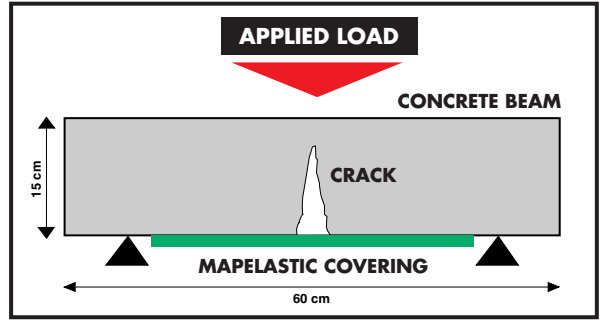
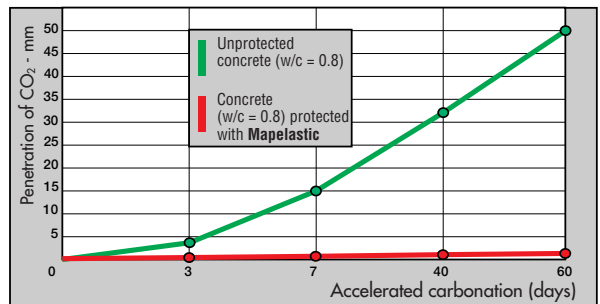
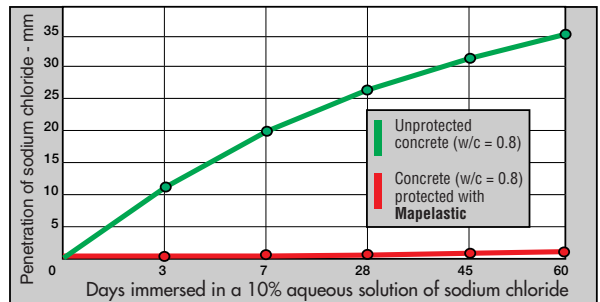


Fig. 1: Protection of a hairline crack with Mapelastic on the underside of a concrete beam subject to flexural stress

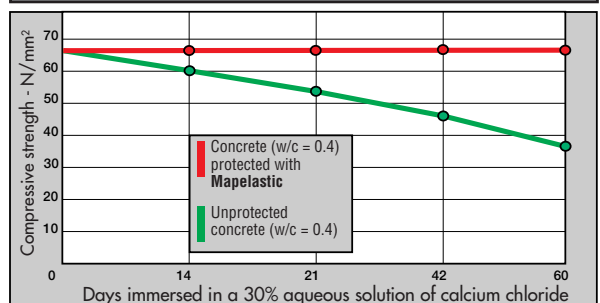
## FIG. 2: PROTECTION OF MAPELASTIC AGAINST ACCELERATED CARBONATION (30% of CO<sub>2</sub>) ON POROUS CONCRETE



## FIG. 3: PROTECTION OF MAPELASTIC AGAINST PENETRATION OF SODIUM CHLORIDE ON POROUS CONCRETE



## FIG. 4: PROTECTION OF MAPELASTIC AGAINST THE DECREASE IN MECHANICAL STRENGTH OF CONCRETE CAUSED BY CALCIUM CHLORIDE BASED DE-ICING SALTS



## TECHNICAL DATA (typical values)

### PRODUCT DETAILS

	comp. A	comp. B
<b>Consistency:</b>	powder	liquid
<b>Colour:</b>	grey	white
<b>Bulk density (g/cm³):</b>	1.4	-
<b>Density (g/cm³):</b>	-	1.1
<b>Dry solids content (%):</b>	100	50
<b>Storage:</b>	12 months	24 months
	in their original packaging in a closed place	
<b>Hazard classification according to 1999/45/CE:</b>	irritant	none
	Before using refer to the "Safety instructions for preparation and application" paragraph and the information on the packing and Safety Data Sheet	
<b>Customs class:</b>	3824 50 90	

### APPLICATION DATA (at 23°C and 50% R.H.)

<b>Colour of mix:</b>	grey
<b>Mixing ratio:</b>	component A : component B = 3 : 1
<b>Consistency:</b>	plastic - applied by trowel
<b>Density of mix (kg/m³):</b>	1,700
<b>Density after application by spraying (kg/m³):</b>	2,200
<b>Application temperature range:</b>	from +8°C to +35°C
<b>Pot life:</b>	60 min.

### FINAL PERFORMANCES

<b>Adhesion to concrete (N/mm²):</b>	
- after 28 days at +23°C and 50% R.H.:	1.1
- after 7 days at +23°C and 50% R.H. + 21 days in water:	0.6
<b>Elongation DIN 53504 (modified):</b>	
- after 28 days at +23°C and 50% R.H. (%):	30
<b>Waterproofing capacity</b>	
<b>EN 12390 / 8 Modified (1.5 bar for 7 days):</b>	waterproof
<b>Crack-bridging of non-reinforced Mapelastic:</b>	
- after 28 days at +23°C and 50% R.H.:	width 0.8 mm
- after 7 days at +23°C and 50% R.H. + 21 days in water:	width 0.6 mm
- after 7 days at +23°C and 50% R.H. + 24 months in water:	width 0.5 mm
<b>Crack-bridging at breakage of Mapelastic membrane reinforced with Fibreglass Mesh</b>	
- after 28 days at +23°C and 50% R.H.:	width 1.5 mm
<b>Crack-bridging at failure of the Mapelastic film reinforced with Mapetex Sel</b>	
- after 28 days at +23°C and 50% R.H.:	width > 3 mm



*Waterproofing of a swimming pool with Mapelastic*



*Laying of ceramic tiles on Mapelastic in a swimming pool*



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



using a hydro-demolition system or a hydro-scarifier.

The last two techniques, which use high-pressure water, are particularly recommended because the reinforcement rods are not damaged and the structures are not subject to vibration which could cause onset of small cracks in adjacent concrete.

Once the rust has been completely removed by sandblasting, carry out the repair with ready-mixed mortar from the **Mapegrout** range or with **Planitop 400** (see relative Technical Data Sheets). Absorbent surfaces to be treated with **Mapelastic** must be dampened beforehand with water.

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

#### • CEMENTITIOUS SCREED:

– slump cracks or cracks caused by plastic or hygrometric shrinkage must be sealed beforehand with **Eporip**;

– if thicknesses of up to 2 cm have to be levelled out (to create slopes, fill in dips, etc.) use **Adesilex P4**.

#### • EXISTING FLOORS

– existing floors and coverings in ceramic, gres, clinker or terracotta, etc. must be well bonded to the substrate and free of substances which 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 of all dust and paint;

• dampen absorbent surfaces to be treated beforehand with water.

### **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 too much air being dragged into the mix.

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 it being mixed.

Smooth off the prepared surface by applying a thin layer of **Mapelastic** with a smooth trowel, then apply a second coat on the first layer while it is still fresh, to have a final thickness of approximately 2 mm.

When used for waterproofing terraces, balconies, basins and swimming pools, it is recommended to insert a layer of 4.5x4 mm **Fibreglass Mesh** in the first layer of fresh **Mapelastic**, to act as a reinforcement (see the **Fibreglass Mesh** Technical Data Sheet).

The mesh must also be used in areas with either small cracks or in areas which are particularly stressed.

After the mesh has been laid, finish off the surface with a flat trowel and apply a second layer of **Mapelastic** when the first one has set (after 4-5 hours).

To further improve both elongation at failure and crack-bridging of **Mapelastic**, we recommend inserting **Mapetex Sel** macro-holed non-woven polypropylene fabric (please see the **Mapetex Sel** data sheet). The first layer of **Mapelastic** must be at least 1 mm thick. While it is still fresh, carefully lay the **Mapetex Sel** 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 **Mapelastic** to completely cover the fabric and smooth over the surface using a flat-bladed trowel.

During waterproofing operations, take special care when operating around expansion joints and joints between horizontal and vertical surfaces, where either **Mapeband**, tape with alkali-resistant felt, or **Mapeband TPE**, tape made from thermo-plastic polymers and synthetic elastomers, must be used.

After applying **Mapelastic**, wait at least 5 days for curing (in favourable climatic conditions) before laying ceramic tiles.

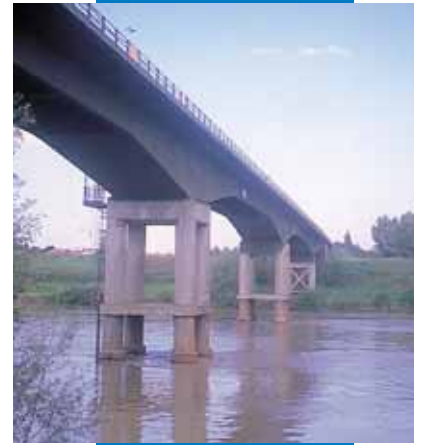
### **Laying ceramic tiles on Mapelastic**

#### • BALCONIES AND SWIMMING POOLS

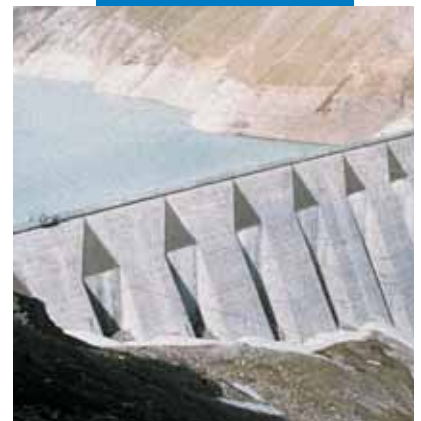
– lay the tiles with MAPEI cementitious adhesives and leave wide joints. In swimming pools, use **Granirapid** (class C2F, S1), **Elastorapid** (class C2FTE, S2) or **Keracrete + Keracrete Powder** (class C2T). If mosaics are laid, **Adesilex P10 + Isolastic** mixed with 50% water may also be used (class C2TE, S1).

– grout the joints between the tiles with a suitable cementitious grout (for example **Keracolor FF**, **Keracolor GG** mixed with **Fugolastic**, **Ultracolor Plus** - class CG2) or epoxy resin (for example **Kerapoxy** - class RG);

– seal expansion joints with **Mapeflex PU21**, **Mapeflex PU20**, **Mapeflex PU50 SL** or **Mapesil AC**, according to requirements.



*Example of Mapelastic applied on a viaduct by spraying*



*Example of Mapelastic applied on a dam by spraying*

## Application of the mortar by spraying

After preparing the surface (see paragraph on "Preparation of the substrate"), apply **Mapelastic** with a spray gun with a lance fitting for smoothing mortar, at a maximum thickness of 2 mm per layer.

If a thicker layer is required, **Mapelastic** must be applied in several coats.

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

In areas with small cracks or which are highly stressed, insertion of 4.5x4 mm **Fibreglass Mesh** in the first layer of fresh **Mapelastic** is recommended.

Immediately after laying the mesh, **Mapelastic** must be smoothed off with a flat trowel.

If the mesh needs to be covered better, a further layer of **Mapelastic** may be applied with a spray gun.

To further improve both elongation at failure and crack-bridging of **Mapelastic**, we recommend inserting **Mapetex Sel** macro-holed non-woven polypropylene fabric (please see the **Mapetex Sel** data sheet). The first layer of **Mapelastic** must be at least 1 mm thick. While it is still fresh, carefully lay the **Mapetex Sel** 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 **Mapelastic** to completely cover the fabric, and smooth over the surface using a flat-bladed trowel.

In the areas around expansion joints and joints between horizontal and vertical surfaces, either **Mapeband**, tape with alkali-resistant felt, or **Mapeband TPE**, tape made from thermo-plastic polymers and synthetic elastomers, must be used.

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

## 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 by covering it with sheets.

## TECHNICAL PERFORMANCE DATA

The Technical Data table contains the identification and application data for the product. Figures 1, 2, 3 and 4 illustrate some of **Mapelastic's** characteristics.

Figure 1 shows the load diagram for evaluating the product's crack-bridging capacity. The sample to which **Mapelastic** was applied, on the underside of the beam, is subjected to increasing loads in the middle. The crack-bridging capacity of **Mapelastic** is determined by measuring the maximum width of the crack in the concrete at the 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 rods.

Figure 2 is a graph which compares accelerated carbonation (in an atmosphere of air enriched with 30% of CO<sub>2</sub>), and shows how **Mapelastic** is completely impermeable to this aggressive substance (Fig. 5). The **Mapelastic** membrane also protects the concrete from the action 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<sub>2</sub>) 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/mm<sup>2</sup>) of concrete permanently immersed in a solution of 30% CaCl<sub>2</sub>. 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.

## 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 set, cleaning may only be carried out by mechanical means.

## CONSUMPTION

Manual application:  
approx. 1.7 kg/m<sup>2</sup> per mm of thickness.

Spray gun application:  
approx. 2.2 kg/m<sup>2</sup> per mm of thickness.

## PACKAGING

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

Upon request, component B may also be supplied in 1000 kg tanks.

## STORAGE

**Mapelastic** component A may be stored up to 12 months in its original packaging.



# Mapelastic



Manufactured in compliance with the regulations of the 2003/53/EC Directive.

**Mapelastic** component B may be stored up to 24 months.

Keep **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 perspiration or other body fluids, produces an irritating alkaline reaction and allergic reactions to those predisposed. Use protective gloves and goggles.

For further information, please refer to the Safety Data Sheet.

PRODUCT FOR PROFESSIONAL USE.

#### **WARNING**

*While the indications and guidelines contained in this data sheet correspond to the company's knowledge and wide experience, they must be considered, under all circumstances, merely as an indication and subject to confirmation only after long-term, practical applications. Therefore, anybody who undertakes to use this product, must ensure beforehand that it is suitable for the intended application and, in all cases, the user is to be held responsible for any consequences deriving from its use.*

**All relevant references for the product are available upon request and from [www.mapei.com](http://www.mapei.com)**

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