

MAPEPROOF P5

Waterproofing bentonite sheet for vertical and horizontal surfaces on underground structures



WHERE TO USE

Waterproofing concrete structures below ground level.

Some typical application examples

Waterproofing horizontal and vertical concrete structures in underground environments, such as below slabs, on retaining walls, on bulkheads and berlinese coverings sheet piling, such as underground car parks, cellars, swimming pools, underpasses basements rooms, etc.

TECHNICAL CHARACTERISTICS

Mapeproof P5 consists of two geofabrics in needle-punched polypropylene, with the upper layer in non-woven fabric and the lower layer in woven fabric, which form a sandwich around a uniform layer of natural sodium bentonite. The needle-punch production process uses thousands of special hooked needles. They force part of the fibres from the upper layer of non-woven fabric to pass through the middle layer of bentonite, and to anchor them to the woven geofabric of the lower support layer. Thanks to this special mechanical strengthening system, the natural sodium bentonite contained in **Mapeproof P5** remains permanently fixed, even after hydration. The special grain size of the bentonite together with the type of non-woven geofabric used, guarantee that the non-woven fabric which comes into contact with the concrete pour is saturated with bentonite. These properties combine so that **Mapeproof P5** becomes a self-sealing composite that, upon contact with water or the humidity from the ground, is transformed into a gel with excellent waterproofing properties.

Mapeproof P5 is not affected by variations of the water table level, since the needle-punch pattern in the geotextile guarantees that the bentonite compound is held firm and stable, even when applied vertically.

APPLICATION PROCEDURE

Preparation of the substrate

The surfaces on which **Mapeproof P5** is to be applied must be even and free of protrusions or voids. The substrates may also be damp but without ponding water

Laying on horizontal surfaces

When laying on horizontal surfaces, cast a layer of concrete to form a uniform layer on which the membrane can be applied. The light-coloured side of **Mapeproof P5** is the side which comes into contact with the concrete to be waterproofed, while the dark-coloured side is in contact with the lean concrete or with the ground. Lay **Mapeproof P5** with staggered joints, overlapping the outer edges by 10 cm. Fix **Mapeproof P5** in place using nails and **Mapeproof CD** washers approximately every 50 cm. Lap the edges of **Mapeproof P5** around the perimeter of the formwork, or onto the vertical surfaces, such as bulkheads, piles, adjacent walls, etc. Then pour on the reinforced concrete, which must be designed to withstand the counter pressure from the underlying

water table. If pouring is interrupted, the second pour must be sealed using **Idrostop B25** or **Idrostop Soft**, bentonite joints, or with **Idrostop**, hydro-expansive acrylic profile. To improve durability, the base concrete must be chosen according to EN 206 standards.

In order to respect the water/cement ratios indicated for the exposure classes contained in the regulation and to guarantee excellent performance both of the fresh and cured concrete (fluidity, maintenance of workability, mechanical strength after short and long waiting times, etc.), it is recommended to use admixtures from the **Dynamon** range (refer to the respective Technical Data Sheets and contact MAPEI Technical Services Department to develop the correct mix design).

Laying on vertical surfaces (after pouring)

Before pouring on vertical surfaces, all construction joints between walls and the slab and between wall and wall, must be sealed using **Idrostop B25** or **Idrostop Soft**, bentonite joints, or with **Idrostop**, hydro-expansive acrylic profile. After carrying out pouring according to EN 206 standards, all the surface irregularities must be removed and clumps of gravel must be smoothed over using **MapegROUT 430 Zero** or **Planitop Smooth & Repair R4 Zero**. The metallic spacers must be removed by forming a hollow approximately 2 cm deep, which must then be sealed using **MapegROUT 430 Zero** or **Planitop Smooth & Repair R4 Zero**. If plastic piping is used as spacers, seal the piping with special plugs and seal the plugs with **Adesilex PG4** two-component, thixotropic epoxy adhesive.

Close to the right angle joint between the wall and the foundations, we recommend forming a fillet joint using **MapegROUT 430 Zero** or **Planitop Smooth & Repair R4 Zero**, or with mortar made up of sand and cement with **Planicrete** admix at a ratio of 1 to 3, in order to form a support base for blending in between the horizontal surface and the vertical surface. Then apply rolls of **Mapectroof P5**, starting from the top, making sure that the ends overlap by at least 10 cm. Fix **Mapectroof P5** in place using nails and **Mapectroof CD** polypropylene washers every 30 cm.

Before filling the excavations, protect the bentonite sheet that has just been applied by overlaying with spun-bound, non-woven fabric with a weight of 250 g/m². Filling must be carried out using carefully selected material without stones in contact with the membrane, in evenly-compacted layers of 40-50 cm.

Laying on bulkheads and berlinese coverings (before pouring)

Clean the surface using a hydro-cleaning machine, and even out the laying surface and ends of the tie rods to remove all protrusions and hollows, using **MapegROUT T60** fibre-reinforced, controlled-shrinkage thixotropic mortar which is resistant to sulphates, used for renovating concrete, together with 0.25% of **Mapecure SRA** admix. Once the mortar has hardened, apply a sheet of **Mapectroof P5** on the ends of the tie-rods in order to reinforce the waterproofing in those areas. Then waterproof all surfaces by applying the geomembrane starting from the top. Overlap the ends of the sheets by 10 cm and fix them in place using nails every 30 cm.

RECOMMENDATIONS

- The bentonite barrier must not be laid directly in water.
- An adequately designed structure made from homogenous, compact concrete must be realised on the bentonite barrier.
- On vertical surfaces of retaining walls (after pouring), as an alternative to **Mapectroof P5**, **Mapelastic Foundation** may be applied using a trowel, roller or with a spray in two coats at a thickness of 2 mm. Then, before filling in the excavations, apply a protective drainage layer in combination with a layer of non-woven fabric, such as **Polyfond Kit Drain** by Polyglass S.p.A.
- If there are elements passing through **Mapectroof P5**, grout the sheet in those areas with **Mapectroof Mastic** bentonite grouting paste.
- Repair any accidental damage to **Mapectroof P5** with **Mapectroof Mastic** bentonite grouting paste or by replacing the damaged part, according to the size of the damaged area.

PACKAGING

Mapectroof P5 is supplied in three formats:

- 1.1 m x 5 m rolls;
- 2.5 m x 25 m rolls;
- 5 m x 44 m rolls.

SAFETY INSTRUCTIONS FOR PREPARATION AND APPLICATION



Mapeproof P5 is an article and referring to the current European regulations (Reg. 1906/2007/CE – REACH) does not require the preparation of the Safety Data Sheet. During use it is recommended to wear protective gloves and goggles and follow the safety requirements of the workplace.
PRODUCT FOR PROFESSIONAL USE.

TECHNICAL DATA (typical values)

In compliance with European harmonised standards: EN 13361, EN 13362, EN 13491, EN 15382

PRODUCT IDENTITY AND FINAL PERFORMANCE

Lower layer of geofabric:	polypropylene fabric
Weight of lower geofabric (g/m ²):	110
Upper layer of geofabric:	non-woven polypropylene
Weight of upper geofabric (g/m ²):	200

Layer of bentonite

Type:	natural sodium bentonite
Mass per unit area (EN 14196) (g/m ²) - with reference to a 12% humidity level:	5,000
Swell index (ASTM D 5890) (ml/2 g):	25

Bentonite barrier

Total mass per unit area (EN 14196) (g/m ²):	5,310
Hydraulic conductivity (ASTM D 5887) (m/s):	2E-11
Flux (ASTM D5887) ((m ³ /m ²)/s):	5E-9
Static puncture strength (EN ISO 12236) (kN):	2.2
Longitudinal tensile strength (EN ISO 10319) (kN/m):	12.0
Transversal tensile strength (EN ISO 10319) (kN/m):	12.0
Peeling (ASTM D6496) (N/m):	450
Bond strength to concrete (ASTM D 903) (kN/m):	2.5
Thickness of product (EN ISO 9863-1) (mm):	6.0

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

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The most up-to-date TDS can be downloaded from our website www.mapei.com.

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Mapei S.p.A.

Via Cafiero, 22, 20158, Milano



+39-02-376731



www.mapei.com



mapei@mapei.it

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