MAPEI

Mapeproof LW

CE 1213-CPD-4489

Bentonite waterproofing sheets for structures below ground level, suitable for both horizontal and vertical surfaces

WHERE TO USE
Waterproofing concrete structures below ground level with a water table less than 5 m.

Some application examples
Waterproofing horizontal and vertical concrete structures in environments below ground level, below foundations, on retaining walls, against diaphragms and soldier-pile walls, for example in underground car-parks, cellars, swimming pools, underpasses and basements.

TECHNICAL CHARACTERISTICS
Mapeproof LW consists of two layers of geo-textile fabrics which are needle-punched together to form a sandwich around a uniform layer of natural sodium bentonite. The needle-punching process involves the use of thousands of needles with a hooked tip, which force part of the fibres of the upper layer of non-woven fabric through the middle layer of bentonite, and stitch it to the lower support layer of geo-textile fabric. Because of this special weaving system, the micronised natural sodium bentonite contained in **Mapeproof LW** remains fixed in place, even after hydration. The weaving process also guarantees that the non-woven geo-textile fabric in contact with the concrete is saturated with bentonite. The properties of **Mapeproof LW** ensure it forms a self-sealing composite which, on contact with moisture in the ground, forms a gel with excellent waterproofing properties.

APPLICATION PROCEDURE
Preparation of the substrate
The surfaces on which **Mapeproof LW** is applied must be even and free of large protruding areas or hollows. The substrate may also be damp.

Laying on horizontal surfaces
When laying on horizontal surfaces, spread a layer of concrete to form an even surface on which the bentonitic barrier will be laid. Lay the **Mapeproof LW** sheets by staggering the joints and overlapping the edges by 10 cm. Fasten the sheets in place with nails and **Mapeproof CD** washers at intervals of approximately 50 cm. Fold the edges of **Mapeproof LW** over formwork and onto vertical surfaces, such as diaphragms, micro-piles, adjacent brickwork, etc. Apply a layer of concrete at least 5 cm thick, with similar characteristics to the foundations, then pour on the reinforced concrete with sufficient protection to resist hydraulic lift. If casting of the concrete is interrupted, the construction joint between old and fresh concrete must be sealed with **Idrostop B25** bentonitic waterstop, or with **20x25 Idrostop** hydro-expanding acrylic tape. To improve durability, concrete used for foundations must be mixed according to UNI 11104 (EN 206) standards, while the cast concrete must be class XC3 if it does not come into contact with aggressive ground, or class XS2 if it is immersed in seawater.

Below is a list of the minimum requirements of the aforementioned classes of concrete:

Exposure class	**XC3**	**XS2**
Maximum water/cement ratio	0.55	0.45
Minimum strength class	C28/35	C35/45
Minimum cement content in kg/m^3	320	360

In order to achieve the recommended water/cement ratios, and guarantee good performance of both the

Mapeproof LW

Waterproofing of structures below ground level against sheet piles

Waterproofing vertical structures against micro-piles

fresh and hardened concrete (fluidity, maintenance of workability, good strength after medium and long periods, etc.), we recommend using admixes from the **Dynamon** range (please refer to the relative technical data sheets, and contact MAPEI's Technical Assistance Department to design the most suitable mix).

Laying on vertical surfaces (after casting)

Before pouring vertically, all construction joints between elevation walls and the foundations, and between adjacent masonry work, must be sealed using **Idrostop B25** bentonitic waterstop, or 20x25 **Idrostop** hydro-expanding acrylic tape. After casting the concrete as prescribed in UNI 11104 (EN 206) standards, all rough surfaces must be eliminated any honey combing must be smoothed over with **Mapegrout Fast-Set** or **Planitop 400**.
Spacers must be removed by forming a 2 cm-deep slot, which must then be sealed using **Mapegrout Fast-Set** or **Planitop 400**. Form a bead to blend in the horizontal and vertical surfaces at the corner between the walls and the foundations with **Mapegrout Fast-Set** or **Planitop 400**, or with mortar made using sand and cement, with **Planicrete** admix at a ratio of 1:3. Then lay rolls of **Mapeproof LW** starting from the top, making sure that the sheets overlap by 10 cm. The sheets must then be fixed in place with nails and **Mapeproof CD** washers at intervals of approximately 30 cm. Holes and trenches around the membrane must be filled using well-graded material without stones and clay, forming well-compacted, homogenous layers approximately 40 to 50 cm thick.

Laying on diaphragms and soldier-pile walls (before casting)

Use a high-pressure hydro-cleaner to wash down the surface. Smooth over the surface and the heads of the tie-rods with **Mapegrout T60** fibre-reinforced, controlled-shrinkage, sulphate-resistant thixotropic mortar for repairing concrete, with an addition of 0.25% of **Mapecure SRA**. Once the concrete has hardened, fix a sheet of **Mapeproof LW** on the heads of the tie-rods to locally reinforce the waterproofing layer. Then waterproof the entire surface by applying sheets of **Mapeproof LW** starting from the top, overlapping the sheets by 10 cm. Fix the sheets in position with nails every 30 cm.

RECOMMENDATIONS

- **Mapeproof LW** must only be used on structures where the water table is no more than 5 m deep.
- The bentonite barrier must not be laid directly under water.
- If the bentonite sheet is laid on horizontal surfaces, we recommend applying a 5 cm-thick layer of concrete.
- Only compact, homogenous concrete structures which are suitable for the foreseen hydrostatic loads must be built on the bentonite barrier.
- The bentonite barrier must only be used for concrete structures.
- Instead of a bentonitic barrier on retaining walls after casting, apply **Mapelastic** with a trowel or a rendering machine with a special spray fitting for levelling off surfaces, or two coats of **Mapelastic Smart** with a brush or roller at a total thickness of 2 mm. Before filling in holes and trenches, apply a layer of protective material such as TNT, or a drainage layer. Ensure the **Mapelastic** / **Mapelastic Smart** is applied to the positive sideof the wall.
- All tie-rods, etc. which pass through the layer of **Mapeproof LW** must be sealed with **Mapeproof Mastic** bentonite grouting paste.
- Damaged areas must be repaired with **Mapeproof Mastic** bentonite grouting paste or replaced with a new piece of **Mapeproof LW**, according to the size of the damaged area.

PACKAGING

Mapeproof LW is supplied in two versions:
– **Mapeproof LW** rolls (2.5 m x 22.5 m);
– **Mapeproof LW** rolls (5 m x 40 m).

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.au

TECHNICAL DATA (typical values) **Conforms to the following standards:**	**– European EN 13361/2006 (appendix ZA)** **– European EN 13362/2005 (appendix ZA)** **– European EN 13491/2006 (appendix ZA)**
PRODUCT IDENTITY	
Geo-textile fabric	
Lower layer of geo-textile fabric:	polypropylene fabric
Weight of lower layer of geo-textile fabric (g/m²):	120
Upper layer of geo-textile fabric:	polypropylene non-woven fabric
Weight of upper layer of geo-textile fabric (g/m²):	220
Layer of bentonite	
Type:	natural sodium
Aeric mass (EN 14196) (g/m²) with 12% humidity:	4,100 (-100 g/m²)
Swelling index ASTM D 5890 (ml/² g):	27
Customs class:	5911 90 90
Bentonitic geo-composite	
Total aeric mass (EN 14196) (g/m²):	4,460
Permeability coefficient (ASTM D 5887) (m/s):	< 1E-11
Permeability with 5 m water table (hydrostatic load 50 kPa) (*):	< 1.85E-11
Static perforation (EN ISO 12236) (N):	1,800 (- 50 N)
Longitudinal tensile strength (EN ISO 10319) (kN/m):	> 12.0 (-0.5 kN/m)
Transversal tear strength (EN ISO 10319) (kN/m):	> 12.0 (-0.5 kN/m)
Peeling (ASTM D 6496) (N/m):	> 385
Bond strength to concrete (ASTM D 903) (N/mm):	> 2.7
Thickness of product (EN 964-1) (mm):	5.0
Seal of overlaps:	the geocomposite product is self-sealing
** Laboratory tests according to ASTM D 5084*	

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