



**BRANZ Appraised**

Appraisal No.484 [2012]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 484 (2012)**

This Appraisal replaces BRANZ  
Appraisal No. 484 (2005) issued  
28 July 2005.

Amended 12 November 2013

**MAPEGUM WPS,  
MAPELASTIC,  
MAPELASTIC SMART  
AND AQUADEFENSE  
WET AREA  
MEMBRANES**

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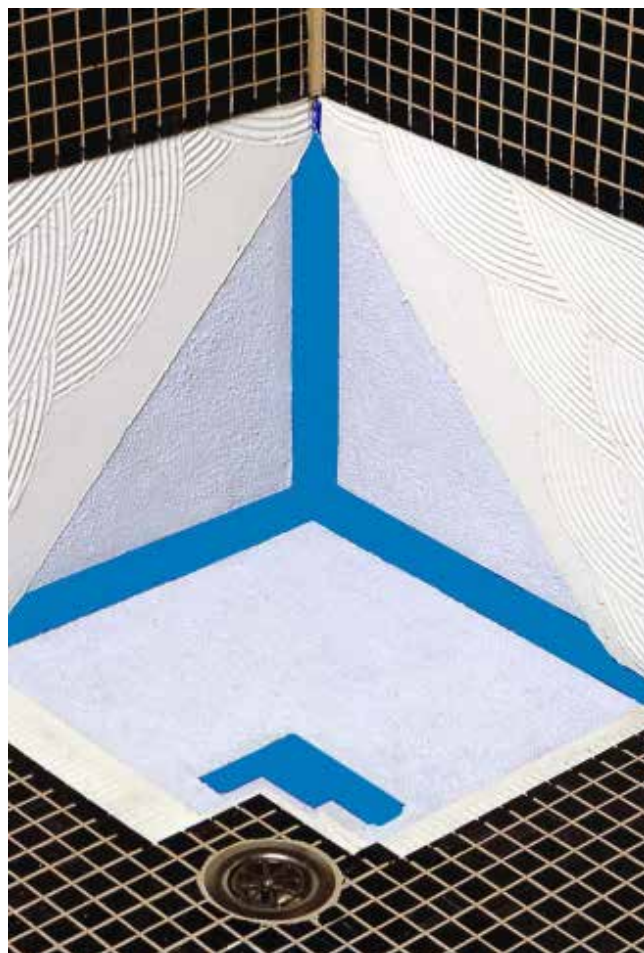
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## Product

1.1 Mapegum WPS and Mapelastic AquaDefense are premixed membranes. Mapelastic and Mapelastic Smart are two-part membranes. They are liquid-applied waterproofing membranes for use under ceramic or stone tile finishes in internal wet areas.



## Scope

2.1 Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes have been appraised for use as waterproofing membranes for internal wet areas of buildings, within the following scope:

- on floor substrates of concrete, flooring grade particle board, plywood, compressed fibre cement sheet and fibre cement sheet tile underlay, and on wall substrates of concrete, concrete masonry, wet area fibre cement sheet lining systems and wet area plasterboard lining systems; and,
- when protected from physical damage by ceramic or stone tile finishes; and,
- where floors are designed and constructed such that deflections do not exceed 1/360<sup>th</sup> of the span.

2.2 The use of Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes on concrete slabs where hydrostatic or vapour pressure is present is outside the scope of this Appraisal.

2.3 Movement and control joints in the substrate must be carried through to the tile finish. The design and construction of the substrate and movement and control joints are specific to each building, and are therefore the responsibility of the building designer and building contractor and are outside the scope of this Appraisal.

2.4 Ceramic or stone tile finishes are outside the scope of this Appraisal.

2.5 The membranes must be installed by Mapei New Zealand Ltd approved applicators.

## Building Regulations

### New Zealand Building Code (NZBC)

**3.1** In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the NZBC:

**Clause B2 DURABILITY:** Performance B2.3.1 (b) 15 years and B2.3.2. Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes meet these requirements. See Paragraph 9.1.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.6. Interior wet area floors and walls incorporating Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes will meet this requirement. See Paragraphs 11.1 - 11.7.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes meet this requirement and will not present a health hazard to people.

**3.2** This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

## Technical Specification

**4.1** Materials supplied by Mapei New Zealand Ltd are as follows:

### Mapegum WPS

- A one-part, fast drying, polymer-based, ready-to-use, liquid-applied membrane. It is supplied as a light grey-coloured paste in 5, 10 and 25 kg buckets.

### Mapelastic

- A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 24 kg multi-wall bags and a Part B liquid in 8 kg plastic containers. When dry, the membrane is grey in colour.

### Mapelastic Smart

- A two-part, flexible, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 10 kg plastic containers. When dry, the membrane is light grey in colour.

### Mapelastic AquaDefense

- A one-part solvent free, ultra-quick drying synthetic resin based paste in water dispersion liquid applied membrane. It is supplied as a light blue coloured paste in 15 kg drums.

### Mapeband and Mapeband Gaskets

- A rubber-coated polyester tape for waterproofing expansion joints and sealing around drains and pipes. Available as a tape 120mm wide in rolls 50m long, and also in ready-made internal and external corners (90 and 270 degrees) and pipe gaskets 118 x 118 mm and 300 x 300 mm, "T" profiles 515 mm x 315 mm and cross profiles 515 x 515 mm.

### Mapeband PE120

- Is a PVC fabric tape used to reinforce wall/wall and floor/wall joints. **It is only used with Mapegum WPS and Mapelastic AquaDefense.** Available as a tape 120 mm wide in rolls 10 m and 50 m long, and also as preformed angles 90° and 270°.

### Mapetex Sel

- Is a macro-holed non-woven fabric, used to reinforce the first and second layer of the waterproofing membranes. It is supplied as a polypropylene, white fabric in rolls 100 mm, 200 mm and 1.0 m wide x 25 m long.

### Mapenet 150

- Is a glass fibre mesh used to reinforce the membranes. It is supplied as a blue mesh in rolls 1.0 m wide and 50 m long.

## Handling and Storage

**5.1** All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and out of freezing conditions. The membrane products have a shelf life of 24 months from date of manufacture in the original unopened packaging. Once opened, the products must be used within 3 months.

## Technical Literature

**6.1** Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes. The Technical Literature must be read in conjunction with this Appraisal. All aspects of design, use, installation and maintenance contained in the Technical Literature and within the scope of this Appraisal must be followed.

## Design Information

### General

**7.1** Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes are for use in buildings where an impervious waterproof membrane is required to floors and walls to prevent damage to building elements and adjoining areas.

**7.2** Mapegum WPS and Mapelastic AquaDefense are designed to be used where a quicker curing time is required, such as in cool or humid conditions.

**7.3** The membranes must be protected from physical damage by the application of ceramic or stone tile finishes.

**7.4** Movement and control joints may be required depending on the shape and size of the building or room, and the tile finish specified. Design guidelines can be found in the BRANZ "Good Practice Guide to Tiling".

**7.5** Timber framing systems must comply with NZS 3604, or where specific engineering design is used, the framing shall be of at least equivalent stiffness to the framing provisions of NZS 3604, or comply with the serviceability criteria of AS/NZS 1170. In all cases framing must be provided so that the maximum span of the substrate as specified by the substrate manufacturer is met and all sheet edges are fully supported. Timber framing systems supporting the substrates must be constructed such that deflections do not exceed 1/360th of the span. Where NZS 3604 is used, the allowable joist spans given in Table 7.1 shall be reduced by 20%.

## Substrates

### Plywood

8.1 Plywood must be a minimum of 17 mm thick complying with AS/NZS 2269, CD Grade Structural with sanded C face upwards and treated to H3 (CCA treated). **LOSP treated plywood must not be used.** The plywood must be supported with dwangs or framing with a maximum span of 400 mm in each direction, fixed with 10g x 50 mm stainless steel countersunk head screws at 150 mm centres along the sheet edges and 200 mm through the body of the sheets.

### Fibre Cement Compressed Sheet/Fibre Cement Sheet Tile Underlay

8.2 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS/NZS 2908.2 and must be specified by the manufacturer as being suitable for use as a wet area substrate. Fibre cement sheet tile underlay must be covered by a valid BRANZ Appraisal for use in internal wet areas. Installation must be in accordance with the manufacturer's instructions.

### Particleboard

8.3 Particleboard must be specified for end use in accordance with NZS 3602.

### Concrete and Concrete Masonry

8.4 Concrete and concrete masonry substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101 and NZS 3604 concrete slab-on-ground floors and concrete masonry to NZS 4229 and NZS 4230.

### Wet Area Wall Linings

8.5 Plasterboard wall linings must be manufactured to comply with AS/NZS 2588, and be covered by a valid BRANZ Appraisal for use in internal wet areas.

8.6 Fibre Cement Sheet must be covered by a valid BRANZ Appraisal for use in wet areas.

## Durability

### Serviceable Life

9.1 The Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes, when subjected to normal conditions of environment and use, are expected to have a serviceable life of at least 15 years and be compatible with ceramic or stone tile finishes with a design service life of 15-25 years.

## Maintenance

10.1 No maintenance of the membranes will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the tiled areas to ensure they are sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles, grouts and sealants.

10.2 In the event of damage to the membranes, the tiling must be removed and the membrane repaired by removing the damaged portion and applying a patch as for new work.

10.3 Drainage outlets must be maintained to operate effectively, and ceramic or stone tile finishes must be kept clean.

## Internal Moisture

11.1 Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes are impervious to water and when appropriately designed and installed will avoid the likelihood of water penetrating behind linings or entering concealed spaces.

11.2 Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes are suitable for use to contain accidental overflow to meet NZBC Clause E3.3.2. A means of code compliance for overflow is given in NZBC Acceptable Solution E3/AS1 Paragraph 2.

11.3 Surfaces must be finished with ceramic or stone tile finishes. A means of code compliance to NZBC Clause E3.3.3 is given in NZBC Acceptable Solution E3/AS1 Paragraph 3.1.1 (b) and 3.1.2 (b).

11.4 Falls in showers and shower areas must be a minimum of 1 in 50. In unenclosed showers, falls must extend a minimum of 1500 mm out from the shower rose. Floor wastes must be provided and the floor must fall to the outlet.

11.5 The waterproofing membrane must completely cover shower bases, and for unenclosed showers it must extend a minimum of 1500 mm out from the shower rose. Further design guidance on waterproofing wet areas, including waterproofing walls and junctions can be obtained from AS 3740, the BRANZ "Good Practice Guide to Tiling", and flooring and wallboard manufacturers.

11.6 Where water resistant wall finishes such as prefinished sheet materials are used, they must flash over the membrane a minimum of 30 mm.

11.7 BRANZ recommends the entire floor be covered by a waterproof membrane for bath, shower and spa rooms where timber and plywood floors are used.

## Installation Information

### Installation Skill Level Requirement

12.1 Installation of the membranes must be completed by trained applicators, approved by Mapei New Zealand Ltd

12.2 Installation of substrates must be completed by tradespersons with an understanding of internal wet area construction, in accordance with instructions given within the Mapei New Zealand Ltd Technical Literature and this Appraisal.

### Preparation of Substrates

13.1 Substrates must be dry, clean and stable before installation commences. Surfaces must be smooth and free from nibs, sharp edges, dust, dirt or other materials such as oil, grease or concrete formwork release agents.

13.2 Concrete substrates can be checked for dryness by using a hygrometer as set out in BRANZ Bulletin No. 424. The relative humidity of the concrete must be 75% or less before membrane application.

13.3 All voids, cracks, holes, joints and excessively rough areas must be filled to achieve an even and uniform surface. Junctions of substrate abutments, such as at wall/floor and wall/wall junctions must have a reinforcement installed as set out in the Technical Literature.

13.4 Substrates must be primed with suitable primer and allowed to cure before the Mapegum WPS is installed. There is no priming required for Mapelastic, Mapelastic Smart and AquaDefense. Absorbent surfaces should be dampened with water prior to the application of the Mapelastic or Mapelastic Smart.

### Membrane Installation

14.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.

14.2 Both Mapelastic and Mapelastic Smart require the liquid and powder to be mixed and left to stand for 5 minutes before re-mixing, then applying. Mapegum WPS and Mapelastic AquaDefense must be thoroughly stirred before application.

## Basis of Appraisal

The following is a summary of the technical investigations carried out:

### Tests

18.1 The following testing has been undertaken by various organisations:

- Mapegum WPS and Mapelastc Wet Area Membranes in accordance with; EN 14891 for initial tensile adhesion strength, tensile strength after water contact, tensile adhesion strength after heat ageing, tensile adhesion strength after contact with lime water, tensile adhesion strength after contact with chlorine water, tensile adhesion strength after freeze-thaw cycles, waterproofing and crack bridging ability; DIN 53504 for tensile strength and maximum elongation after exposure to air and water immersion (Mapegum WPS only) and; Mapei internal method for water absorption after exposure and water immersion.
- Mapelastc Smart in accordance with EN 1502-4 for bond strength to concrete, freeze thaw, flexibility, static and dynamic crack bridging, water vapour permeability, impermeability to water and bond strength after water immersion, heat ageing, freeze-thaw and alkali ageing.
- Mapelastc in accordance with; EN 14891 for crack bridging after 28 days exposure to air, crack bridging after 7 days exposure to air and 21 days immersion in water, adhesion to concrete surface after 28 days exposure to air and 21 days immersion in water; DIN 52615 for resistance to water vapour transmission and; Mapei internal method for deformability under low temperatures.
- Mapegum WPS in accordance with; EN 1384 for tensile adhesion strength after exposure and water immersion; UNI 8202/22 for water absorption after exposure and water immersion and; DIN 53505 for shore A hardness.
- Mapelastc AquaDefense in accordance with AS/NZS 4858 Appendix A including effect of heat ageing, bleach, detergent and water on tensile and elongation, water vapour transmission to ASTM E96-92 and cyclic movement resistance requirements of AS/NZS4858:2004 Appendix B. Testing to ANSI 118.10-1999 including seam strength, breaking strength, dimensional stability, resistance to fungi, static head and shear strength to ceramic tile and cement mortar. Also tensile adhesion on a plywood substrate and low temperature flexibility of the membrane.

Test methods and results were reviewed by BRANZ and found to be satisfactory.

18.2 Testing of Mapegum WPS and Mapelastc has been undertaken by BRANZ for durability in accordance with AS/NZS 4858: 2004, Appendix A covering tensile strength and elongation after immersion in water, bleach, detergent, and after heat ageing.

18.3 Testing for suitability of Mapelastc over particleboard in accordance with AS/NZS 4858: 2004, Appendix C has been undertaken by BRANZ and found to be satisfactory.

### Other Investigations

19.1 An assessment was made of the durability of the Mapegum WPS, Mapelastc, Mapelastc Smart and AquaDefense Wet Area Membranes by BRANZ technical experts.

19.2 Site visits have been carried out by BRANZ to assess the practicability of installation and to examine completed installations.

19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

14.3 The membrane must be applied in a minimum of two coats at the rates set out in the Technical Literature. Subsequent coats must be applied in an opposite direction to the previous coat. The total finished system thickness of the Mapegum WPS must be a minimum of 1.0 mm, Mapelastc AquaDefense membrane must be a minimum of 1.0 mm and the Mapelastc and Mapelastc Smart Membrane must be a minimum of 2.0 mm.

14.4 Application can be made by roller (medium/long nap), brush (long bristle), or a notched steel trowel (finished with a flat steel trowel).

14.5 Reinforcement fabric or Mapeband is bedded into the wet layer between coats to provide movement protection at wall/wall and wall/floor junctions, or any other areas such as joints in the flooring substrate, floor cracks, or around penetrations in the membrane. In all other situations, reinforcement provisions as set out in this Appraisal and the Technical Literature apply.

14.6 Clean up may be undertaken with water.

### Tiling

15.1 The membranes must be fully cured before tiling. The cured membranes must be protected at all times to prevent mechanical damage, so may require temporary covers until the finishing is completed.

15.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ "Good Tiling Practice Guide". The compatibility of the tile adhesive must be confirmed with the adhesive manufacturer or Mapei New Zealand Ltd.

### Inspections

16.1 The Technical Literature must be referred to during the inspection of membrane installations.

16.2 Critical areas of inspection are:

- Construction of substrates, including crack control and installation of bond breakers and movement control joints.
- Moisture content of the substrate prior to the application of the membrane.
- Acceptance of the substrate by the membrane installer prior to application of the membrane.
- Installation of the membrane to the manufacturer's instructions, particularly installation to the correct thickness and use of reinforcement.
- Membrane curing and integrity prior to the installation of tiles including protection from mechanical damage during curing and prior to tile installation.

### Health and Safety

17.1 Safe use and handling procedures for the membranes are provided in the Technical Literature. The materials must be used in conjunction with the relevant Material Safety Data Sheet.

## Quality

20.1 The manufacture of the membranes has not been examined by BRANZ, but details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.

20.2 The quality management system of the membranes manufacturer has been assessed and found to be satisfactory.

20.3 The quality of manufacture of the membranes is the responsibility of the manufacturer.

20.4 The quality of supply of the membrane system materials to the market is the responsibility of Mapei New Zealand Ltd.

20.5 Quality on site is the responsibility of the Mapei New Zealand Ltd approved applicators.

20.6 Designers are responsible for the substrate design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of the substrate manufacturer, Mapei New Zealand Ltd and this Appraisal.

20.7 Building owners are responsible for the maintenance of the tiling or stone finishing systems in accordance with the instructions of Mapei New Zealand Ltd.

## Sources of Information

- AS/NZS 1170: 2002 Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS/NZS 2269: 2008 Plywood-Structural.
- AS 3958.1 Guide to the installation of ceramic tiles.
- AS/NZS 4858: 2004 Wet area membranes.
- DIN 52165 November 1987 Determination of water vapour (moisture) permeability of construction and insulating materials.
- DIN 53504 May 1994 Determination of tensile stress/strain properties of rubber.
- DIN 53505 August 2000 Testing of rubber - Shore A and Shore D hardness test.
- DIN 53507 July 2004 Rubber, vulcanized or thermoplastic - Determination of tear strength.
- EN 1348: 1997/A1 Adhesives for tiles – Determination of tensile adhesion strength for cementitious adhesives.
- EN 14891 March 2003 Liquid applied waterproofing membranes for use beneath ceramic tiling – Definitions, specifications and test methods.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.
- Good Practice Guide to Tiling, BRANZ, March 2004.
- UNI 8202 – 22: 1987 Building. Water proof sheets. Determination of behaviour in water.



**BRANZ**

**In the opinion of BRANZ, Mapegum WPS, Mapelastic, Mapelastic Smart and AquaDefense Wet Area Membranes are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.**

**The Appraisal is issued only to Mapei New Zealand Ltd, and is valid until further notice, subject to the Conditions of Appraisal.**

### Conditions of Appraisal

1. This Appraisal:
  - a) relates only to the product as described herein;
  - b) must be read, considered and used in full together with the technical literature;
  - c) does not address any Legislation, Regulations, Codes or Standards, not specifically named herein;
  - d) is copyright of BRANZ.
2. [Mapei New Zealand Ltd](#):
  - a) continues to have the product reviewed by BRANZ;
  - b) shall notify BRANZ of any changes in product specification or quality assurance measures prior to the product being marketed;
  - c) abides by the BRANZ Appraisals Services Terms and Conditions.
  - d) Warrants that the product and the manufacturing process for the product are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ pursuant to BRANZ's Appraisal of the product.
3. BRANZ makes no representation or warranty as to:
  - a) the nature of individual examples of, batches of, or individual installations of the product, including methods and workmanship;
  - b) the presence or absence of any patent or similar rights subsisting in the product or any other product;
  - c) any guarantee or warranty offered by [Mapei New Zealand Ltd](#).
4. Any reference in this Appraisal to any other publication shall be read as a reference to the version of the publication specified in this Appraisal.
5. BRANZ provides no certification, guarantee, indemnity or warranty, to [Mapei New Zealand Ltd](#) or any third party.

For BRANZ

P Burghout  
Chief Executive

### Amendment No. 1, dated 12 November 2013.

This Appraisal has been amended to include an additional product.

Date of issue: 18 July 2012