



BRANZ Appraised

Appraisal No. 485 [2018]

MAPELASTIC, MAPELASTIC SMART AND MAPELASTIC TURBO EXTERNAL WATERPROOFING MEMBRANES

Appraisal No. 485 [2018]

This Appraisal replaces BRANZ Appraisal No. 485 [2012]

Amended 23 December 2019



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Mapelastico, Mapelastico Smart and Mapelastico Turbo are two-component liquid applied waterproofing membranes for external applications on substrates under ceramic or stone tile finishes for decks and balconies.

Scope

- 2.1 Mapelastico, Mapelastico Smart and Mapelastico Turbo External Waterproofing Membranes have been appraised as a waterproofing membrane on buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan areas; and,
 - with building structures designed and constructed to meet the requirements of the NZBC; and,
 - with deck and balcony supporting structures of timber framing with substrates of plywood and fibre cement compressed sheet; and,
 - with substrates of suspended concrete slabs; and,
- 2.2 Mapelastico, Mapelastico Smart and Mapelastico Turbo External Waterproofing Membranes have also been appraised for use as a waterproofing membrane on specifically designed buildings within the following scope:
- with building structures designed and constructed to comply with the NZBC; and,
 - with deck and balcony supporting structures of timber framing with substrates of plywood and fibre cement compressed sheet; and,
 - with substrates of suspended concrete slab; and,
 - subjected to maximum wind pressures [Refer Paragraph 7.7]; and,
 - with the weathertightness design of all junctions being the subject of specific design by the designer.
- Note: The design of these junctions has not been appraised by BRANZ and is outside the scope of this Appraisal.*
- 2.3 Decks and balconies waterproofed with Mapelastico, Mapelastico Smart and Mapelastico Turbo External Waterproofing Membranes must be designed and constructed in accordance with the following limitations:
- constructed to suitable falls [Refer Paragraphs 12.4]; and,
 - with the membranes continually protected from exposure to UV [ultra violet] light and from physical damage by ceramic or stone tile finishes; and,
 - with decks and balconies designed and constructed such that deflections do not exceed 1/360th of the span; and,
 - with no steps within the deck level, no integral roof gardens and no down pipes discharging directly onto the deck.



- 2.4 Movement and control joints in the substrate must be carried through the membrane and tile finish. The design and construction of the substrate and movement and control joints is specific to each building, and is therefore the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.
- 2.5 The ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.6 The membrane must be installed by trained applicators, approved by Mapei New Zealand Ltd to the conditions of the Technical Data Sheet [TDS] of the products.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing 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. Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes meet these requirements. See Paragraph 9.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Decks and balconies incorporating Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes meet these requirements. See Paragraphs 12.1 – 12.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes meet this requirement and will not present a health hazard to people.

Technical Specification

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

- **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 Turbo** - A two-part, cementitious, liquid-applied membrane. It is supplied as a Part A powder in 20 kg multi-wall bags and a Part B liquid in 16 kg containers. When dry, the membrane is light grey in colour.
- **Mapeband and Mapeband Gaskets** - A rubber-coated polyester tape for waterproofing expansion joints and sealing around drains and pipes in conjunction with Mapeband gaskets. Available as a tape 120 mm wide in rolls 50 m 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.
- **Mapetex Sel** - 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** - 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.
- **Mapeband SA** - A self-adhesive Butyl Rubber tape used to reinforce all joints. It is supplied as a 2 mm thick, 100 mm wide tape in rolls 25 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 materials in the original unopened packaging have a shelf life of 24 months from date of manufacture. Once opened, the materials 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 Mapelastastic, Mapelastastic Smart and Mapelastastic Turbo External Waterproofing 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 Mapelastastic, Mapelastastic Smart and Mapelastastic Turbo External Waterproofing Membranes are for use on decks and balconies where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 The membranes must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes.
- 7.3 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to the BRANZ publication, Good Practice Guide - Membrane Roofing.
- 7.4 Movement and control joints may be required depending on the shape and size of the deck, and the finish specified. Design guidelines for control joints for tiles can be found in the BRANZ Good Practice Guide - Tiling.
- 7.5 Timber framing 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 that all sheet edges are fully supported.
- 7.6 Timber framing 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 must be reduced by 20%.
- 7.7 Mapelastastic, Mapelastastic Smart and Mapelastastic Turbo External Waterproofing Membranes are suitable for use in areas subject to maximum wind pressures of 6kPa ultimate limit state.

Substrates

Fibre Cement Compressed Sheet

- 8.1 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 an external decking substrate. The fibre cement sheet must be of a thickness to meet specific structural design requirements and must be secured to the structure to resist wind uplift and all other forces acting on the deck or balcony, such as deflection from gravity and live loads. Installation must be in accordance with the instructions of the manufacturer.

Concrete

- 8.2 Concrete substrates must be to a specific engineering design meeting the requirements of the NZBC, such as concrete construction to NZS 3101.

Durability

Serviceable Life

- 9.1 Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing 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 tiling to ensure it is sound and will not allow moisture to penetrate. Any cracks or damage must be repaired immediately by repairing the tiles grout, and sealant.
- 10.2 In the event of damage to a membrane, the tiles must be removed and the membrane repaired by removing the damaged portion and applying a patch with sufficient overlap over the damaged section.
- 10.3 Drainage outlets must be maintained to operate effectively, and tile finishes must be kept clean. Cleaning materials that may affect polymer based membranes must not be used.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 12.1 Decks and balconies must be designed and constructed to shed precipitated moisture. They must also take account of snowfalls in snow prone areas. A means of meeting code compliance with NZBC Clause E2.3.1 is provided by the Technical Literature which gives details aligned with NZBC Acceptable Solution E2/AS1.
- 12.2 When installed in accordance with this Appraisal and the Technical Literature, Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes will prevent the penetration of water and will therefore meet code compliance with Clause E2.3.2. The membranes are impervious to water and will give a weathertight deck or balcony.
- 12.3 Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes are impermeable; therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with Clause E2.3.6.
- 12.4 The minimum fall to decks and balconies is 1 in 40. The minimum fall to gutters is 1 in 60 and all falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane and tile finish.
- 12.5 Deck and balcony falls must be built into the substrate and not created with mortar screeds applied over the membrane.
- 12.6 Allowance for deflection and settlement of the substrate must be made in the design of the deck or balcony to ensure falls are maintained and no ponding of water can occur.
- 12.7 Drainage flanges must be used for any outlet and must be fitted with a grate or cage to reduce potential sources of blockages. An overflow must be provided where the deck or balcony does not drain to an external gutter or spouting.
- 12.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by blockage of deck and balcony drainage.
- 12.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.



Installation Information

Installation Skill Level Requirement

- 13.1 Installation of the membranes must be completed by trained applicators approved by Mapei New Zealand Ltd.
- 13.2 Installation of substrates must always be carried out in accordance with the Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

Preparation of Substrates

- 14.1 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. All surface defects must be filled to achieve an even and uniform surface.
- 14.2 The relative humidity of concrete substrates must be 75% or less before membrane application. The concrete can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585.
- 14.3 The moisture content of the timber substructure must be a maximum of 20% and fibre cement compressed sheet must be dry at time of membrane application. This will generally require fibre cement sheets to be covered until just before the membrane is laid, to prevent rain wetting.
- 14.4 Refer to the product manufacturer for correct priming requirements.

Membrane Installation

- 15.1 Installation must not be undertaken where the substrate surface temperature is below 8°C or above 35°C.
- 15.2 Mapelastic, Mapelastic Smart and Mapelastic Turbo require the liquid and powder to be mixed and left to stand for 5 minutes before re-mixing, then applying.
- 15.3 The membranes 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 the Mapelastic, Mapelastic Smart and Mapelastic Turbo Membranes must be a minimum of 2.0 mm.
- 15.4 Application can be made by roller [medium/long nap], brush [long bristle], or a notched steel trowel [finished with a flat steel trowel].
- 15.5 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.
- 15.6 Clean up may be undertaken with water.

Tiling

- 16.1 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 protection until the finishing is completed.
- 16.2 Tiling must be undertaken in accordance with AS 3958.1 and the BRANZ Good Practice Guide - Tiling. The compatibility of tile adhesive must be confirmed with the adhesive manufacturer or Mapei New Zealand Ltd.

Inspections

- 17.1 Critical areas of inspection for waterproofing systems 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 moisture, frost and mechanical damage during curing.

Health and Safety

- 18.1 Safe use and handling procedures for the membrane systems are provided in the Technical Literature. The products must be used in conjunction with the relevant Materials Safety Data Sheet for each membrane.

Basis of Appraisal

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

Tests

- 19.1 The following testing has been undertaken by Mapei, Italy Research and Development laboratory:
- Mapelastic 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 and; Mapei internal method for water absorption after exposure and water immersion.
 - Mapelastic 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.
 - Mapelastic 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, 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.
 - Mapelastic Turbo in accordance with EN1504-2 and EN14891 for water vapour permeability, capillary adsorption and permeability to water, permeability to water, freeze-thaw cycling, crack-bridging ability, pull off adhesion and bond strength. Also tensile adhesion on a plywood substrate.
- 19.2 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.
- 19.3 Testing of Mapelastic 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.

Other Investigations

- 20.1 An assessment was made of the durability of the Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing Membranes by BRANZ technical experts.
- 20.2 Site inspections have been carried out by BRANZ to examine the practicability of installation, and to examine completed installations.
- 20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.



Quality

- 21.1 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.
- 21.2 The quality management system of the membranes manufacturer has been assessed by BRANZ and found to be satisfactory.
- 21.3 The quality of supply of the membrane system materials to the market is the responsibility of Mapei New Zealand Ltd.
- 21.4 Quality on site is the responsibility of the Mapei New Zealand Ltd trained applicators.
- 21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing system and substrates.
- 21.6 Building owners are responsible for the maintenance of the ceramic or stone tiles in accordance with the instructions of Mapei New Zealand Ltd.

Sources of Information

- AS/NZS 1170 Series - Structural design actions.
- AS/NZS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS 3958.1: 2007 Guide to the installation of ceramic tiles.
- AS/NZS 4858: 2004 Wet area membranes.
- DIN 53504 May 1994 Determination of tensile stress/strain properties of rubber.
- 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 - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.
- Good Practice Guide - Tiling, BRANZ, April 2015.
- UNI 8202 - 22: 1987 Building. Waterproof sheets. Determination of behaviour in water.
- Good Practice Guide - Membrane Roofing, BRANZ, October 2015.

Amendments

Amendment No.1 23 December 2019

This Appraisal has been amended to expand the scope of the product, update references to C/AS2 and update Sources of Information.



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09 February 2018

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AND MAPELASTIC TURBO EXTERNAL
WATERPROOFING MEMBRANES



In the opinion of BRANZ, **Mapelastic, Mapelastic Smart and Mapelastic Turbo External Waterproofing 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

Chelydra Percy

Chief Executive

Date of Issue:

09 February 2018