



BRANZ Appraised

Appraisal No. 925 [2019]

ARDEX WPM 1000 EXTERNAL DECK MEMBRANE

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BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 ARDEX WPM 1000 Exterior Membrane is a fully bonded, synthetic rubber, weldable sheet waterproofing membrane for use under directly adhered or uncoupled ceramic or stone tile finishes on external decks and balconies.

Scope

- 2.1 ARDEX WPM 1000 Exterior Membrane has been appraised for use as a deck and balcony waterproofing membrane for buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
 - the scope of limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area when subject to specific engineering design; and,
 - with substrates of plywood, fibre cement compressed sheet or suspended concrete slab; and,
 - with minimum falls for decks and balconies of 1:40 for plywood and 1:60 for concrete; and,
 - with deck and balcony size limited to 40 m²; and,
 - situated in NZS 3604 Wind Zones up to and including Extra High with adhesive fixed tiles.
- 2.2 Ardex WPM 1000 Exterior Membrane has also been appraised as a deck and balcony membrane on buildings with the following scope:
 - subject to specific structural design; and,
 - with substrates of plywood, fibre cement compressed sheet or suspended concrete slab; and,
 - situated in specific design wind pressures up to a maximum design differential ultimate limit state [ULS] of 6kPa with adhesive fixed tiles; and ,
 - the weathertightness details at the interface with other building elements must be the subject to specific weathertightness design.
- 2.3 Decks and balconies must be designed and constructed in accordance with the following limitations:
 - with the membrane continually protected from exposure to ultra violet [UV] light and from physical damage by ceramic or stone tile finishes; and,
 - with no steps within the deck level 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 ARDEX New Zealand Ltd.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, ARDEX WPM 1000 Exterior Membrane, 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. ARDEX WPM 1000 Exterior Membrane meets these requirements. See Paragraph 9.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Decks and balconies incorporating ARDEX WPM 1000 Exterior Membrane meet these requirements. See Paragraphs 12.1 – 12.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. ARDEX WPM 1000 Exterior Membrane meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 Materials supplied by ARDEX New Zealand Ltd are as follows:

ARDEX WPM 1000 Exterior Membrane

- A single ply, synthetic rubber, fleece-lined waterproofing sheet membrane specially formulated for heat welded joints and direct adhesion of a tiled system. It is supplied as a nominal thickness of 1.2mm, 1.4m wide x 20m long roll.

ARDEX WA 98 Adhesive

- Is a high performance roofing contact adhesive. It has been specially developed for bonding ARDEX WPM 1000. It is supplied in 1, 4 and 20 litre pails.

ARDEX UD 150

- Is a thin layer undertile drainage mat. It is supplied in cartons of 8 x 2m² sheets. Each sheet is 1.02m x 1.96m x 9 mm.

Handling and Storage

5.1 All materials must be stored inside, up off concrete floors, in dry conditions, out of direct sunlight and freezing conditions. The materials in the original unopened packaging have a shelf life of 12 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 ARDEX WPM 1000 Exterior Membrane. 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 ARDEX WPM 1000 Exterior Membrane is 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 membrane must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes.
- 7.3 Where uncoupled ceramic or stone tile finishes are planned to be used the designer must consider the wind exposure and how to prevent wind uplift. The maintenance of the drainage outlets must also be considered. Uncoupled tile finishes are outside the scope of this Appraisal.
- 7.4 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.

- 7.5 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.
- 7.6 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.
- 7.7 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%.

Substrates

Plywood

- 8.1 Plywood must be treated to H3 (CCA treated). LQSP treated plywood must not be used. Plywood must comply with NZBC Acceptable Solution E2/AS1, Paragraphs 8.5.3 and 8.5.5.

Fibre Cement Compressed Sheet

- 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 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

- 8.3 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 ARDEX WPM 1000 Exterior Membrane, when subjected to normal conditions of environment and use, is expected to have a serviceable life of at least 15 years and be compatible with adhesive fixed ceramic or stone tiling finishes with a design serviceable life of 15-25 years.

Maintenance

- 10.1 No maintenance of the membrane will be required provided significant substrate movement does not occur and the tile finish remains intact. Regular checks must be made of the adhesive fixed 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 the membrane, 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 tile finishes must be kept clean.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to ARDEX WPM 1000 Exterior Membrane from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 – C/AS6 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, ARDEX WPM 1000 Exterior Membrane will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membrane is impervious to water and will give a weathertight deck or balcony.
- 12.3 ARDEX WPM 1000 Exterior Membrane is impermeable therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with NZBC Clause E2.3.6.
- 12.4 The minimum fall to decks and balconies is 1 in 40 for plywood and 1:60 for concrete. The minimum fall to gutters is 1 in 100 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 tiling 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 membrane 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 membrane must be completed by trained applicators, approved by ARDEX New Zealand Ltd that have experience in the application of waterproofing membranes and understand waterproofing principles.
- 13.2 Installation of substrates must be completed by or under the supervision of Licensed Building Practitioners with the relevant License Class, in accordance with the instructions given within the ARDEX New Zealand Ltd Technical Literature and this Appraisal.

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 and plywood must be a maximum of 20% and plywood sheets must be dry at the time of membrane application. This will generally require plywood to be covered until just before the membrane is applied, to prevent rain wetting.

Membrane Installation

- 15.1 Installation must not be undertaken where the substrate surface temperature is below 5°C or above 35°C.



- 15.2 The membrane should be unrolled twenty minutes prior to installation to relieve stress and then then be placed in the exact position in which it is to be installed.
- 15.3 The membrane is then folded in half lengthwise to expose half the underside of the membrane and half of the deck that the membrane is going to be adhered to.
- 15.4 An even coat of ARDEX WA 98 adhesive is applied to both the underside of the membrane and the substrate. After the adhesive has become touch dry the sheet is worked back into the adhesive. This process is repeated for the other half. When applying the next sheet, it should be lapped over the first sheet by 50mm.
- 15.5 Once the whole area has been covered, the joints are all welded.
- 15.6 Clean up may be undertaken with ARDEX WA98 Solvent.

Tiling

- 16.1 The compatibility of the tile adhesive must be confirmed, only adhesive recommended by ARDEX New Zealand Ltd must be used.
- 17.1 Tiling should be completed within 30 days of the membrane installation. Ardex New Zealand Ltd should be consulted if this deadline is missed.

Inspections

- 18.1 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.
 - Membrane integrity prior to the installation of tiles, including protection from moisture, frost and mechanical damage.

Health and Safety

- 19.1 Safe use and handling procedures for the membrane systems are provided in the Technical Literature. The product must be used in conjunction with the relevant Material Safety Data Sheet for the membrane.

Basis of Appraisal

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

Tests

- 20.1 The following testing of ARDEX WPM 1000 Exterior Membrane has been undertaken:
 - Testing to AS/NZS 4858: 2004
 - Testing for cyclic movement, adhesion to substrates, abrasion resistance, resistance to aging, resistance to water, resistance to chemicals and water absorption, static head, low temperature flexibility, drop weight resistance and lap joint adhesion.

The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 21.1 An assessment was made of the durability of ARDEX WPM 1000 Exterior Membrane by BRANZ technical experts.
- 21.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 21.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of the membrane has been examined by BRANZ, and details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 22.2 The quality of supply to the market is the responsibility of ARDEX New Zealand Ltd.



- 22.3 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing system and substrate.
- 22.4 Quality on site is the responsibility of the trained applicators, approved by ARDEX New Zealand Ltd.
- 22.5 Building owners are responsible for the maintenance of the ceramic tiles in accordance with the instructions of the ceramic or stone tile supplier.

Sources of Information

- AS 3958.1: 1991 Guide to the installation of ceramic tiles.
- AS/NZS 2908.2: 2000 Cellulose-cement products – Flat sheet.
- AS/NZS 1170: 2002 Structural design actions
- AS/NZS 2269: 2008 Plywood – Structural.
- AS/NZS 4858 – 2004 Wet area membranes.
- NZS 3101: 1995 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005, [Amendment 8, 30 November 2018].
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.
- Good Practice Guide: Tiling, [3rd Edition] BRANZ, March 2015.
- Good Practice Guide: Membrane Roofing, BRANZ, 2003.
- BRANZ Bulletin 585 – Measuring moisture in timber and concrete.



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14 June 2019

ARDEX WPM 1000 EXTERNAL
MEMBRANE



In the opinion of BRANZ, **ARDEX WPM 1000 EXTERNAL DECK MEMBRANE** is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **ARDEX New Zealand Limited**, 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. **ARDEX 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 **ARDEX 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 **ARDEX New Zealand Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

14 June 2019