



BRANZ Appraised
Appraisal No. 473 [2022]

ARDEX UNDERTILE EXTERNAL LIQUID WATERPROOFING MEMBRANES

Appraisal No. 473 [2022]

This Appraisal replaces BRANZ
Appraisal No. 473 [2017]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 ARDEX Undertile Liquid Membranes are liquid-applied waterproofing membranes for use under ceramic or stone tile finishes on external decks and balconies.

Scope

- 2.1 ARDEX Undertile Liquid Membranes have been appraised for use as deck and balcony waterproofing membranes for buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1; or,
 - the scope 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 fibre cement compressed sheet or suspended concrete slab; and,
 - with minimum falls for fibre cement compressed sheet of 1:60 or suspended concrete slab of 1:60; and,
 - with deck and balcony size limited to 40 m²; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Decks and balconies must be designed and constructed in accordance with the following limitations:
- with the membrane continually protected from exposure to ultraviolet (UV) light and from physical damage by ceramic or stone tile finishes; and,
 - with no steps within the deck level and no downpipes discharging directly onto the deck.
- 2.3 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.
- 2.4 The ceramic or stone tile finishes are outside the scope of this Appraisal.
- 2.5 The membranes must be installed by trained installers, approved by ARDEX New Zealand Limited.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, ARDEX Undertile External Liquid 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. ARDEX Undertile Liquid Membranes meet these requirements. See Paragraph 9.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Decks and balconies incorporating ARDEX Undertile Liquid Membranes meet these requirements. See Paragraphs 12.1–12.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. ARDEX Undertile Liquid Membranes meet this requirement.

Technical Specification

- 4.1 Materials supplied by ARDEX New Zealand Limited are as follows:

- **ARDEX WPM 001** is a one-part, polymer-based, ready-to-use, liquid-applied membrane containing micro-fibres, supplied as a light blue thixotropic paste in 20 kg [approximately 15 L] pails.
- **ARDEX WPM 002** is a fast drying, two-part, flexible, cementitious-based, liquid-applied membrane containing micro-fibres. It is supplied as ARDEX WPM 002 Part A Liquid in 20 kg pails and ARDEX WPM 002 Part B Powder in 10 kg multi-wall bags. When dry, the membrane is light grey in colour.
- **ARDEX WPM 155 Rapid** is a one-part, water-based polyurethane acrylic, ready-to-use, liquid-applied, rapid setting membrane. It is supplied as a blue colour in 4 and 15 L pails.
- **ARDEX STB Tape** is an uncured butyl tape with a fleece layer that is used in the ARDEX WPM 155 Rapid under tile waterproofing system.
- **ARDEX Multiprime** is a water-based primer used to seal substrates and enhance the adhesion of the membranes. It is supplied as a red coloured liquid in 1, 4 and 20 L plastic containers.

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 This Appraisal must be read in conjunction with:
- ARDEX WPM 001 Superflex Bathroom and Balcony Premixed, March 2012.
 - ARDEX WPM 002 Superflex Bathroom and Balcony Two Part, Jan 2022.
 - ARDEX WPM 155 Rapid, May 2013.
- 6.2 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 Undertile Liquid 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 membrane must be protected from exposure to UV light and from physical damage by ceramic or stone tile finishes within seven days.
- 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 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%.

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 ARDEX Undertile Liquid 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 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 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 the ARDEX Undertile Liquid Membranes from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 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 Undertile Liquid Membranes 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 Undertile Liquid Membranes are 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 with a fibre cement compressed sheet substrate is 1 in 40. The minimum fall to suspended concrete slab decks and balconies is 1 in 60. 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 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 installers, approved by ARDEX New Zealand Limited 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 [LBP] with the relevant Licence Class, in accordance with the instructions given within the ARDEX New Zealand Limited 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 must be a maximum of 20% and fibre cement sheets must be dry at the time of membrane application. This will generally require the fibre cement sheets to be covered until just before the membrane is applied, to prevent rain wetting.
- 14.4 Substrates must be primed with ARDEX Multiprime and allowed to dry fully before the membrane is installed.

Membrane Installation

- 15.1 Installation must not be undertaken where the substrate surface temperature is below 10°C or above 35°C.
- 15.2 ARDEX WPM 002 liquid and dry components must be mixed and left to stand for 5 minutes before re-mixing, then applying. ARDEX WPM 001 and ARDEX WPM 155 Rapid must be thoroughly stirred before application.
- 15.3 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 thickness of the membrane must be 0.5-1.2 mm.
- 15.4 Membrane application can be made by roller (medium/long nap), brush (long bristle), or a flat steel trowel.
- 15.5 The installation and use of a reinforcement or bond breaker must comply with the instructions in the Technical Literature.
- 15.6 Clean up may be undertaken with water.

Tiling

- 16.1 The membrane must be fully cured before tiling. The cured membrane 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 the tile adhesive must be confirmed with the adhesive manufacturer or ARDEX New Zealand Limited.

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 system are provided in the Technical Literature. The products must be used in conjunction with the relevant Material 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 of ARDEX WPM 001 and ARDEX WPM 002 has been undertaken by ARDEX Australia Pty Ltd research and development laboratory: water vapour transmission, water absorption, tensile strength and elongation before and after UV exposure, immersion in bleach, immersion in industrial detergent and immersion in water. Test methods and results were reviewed by BRANZ and found to be satisfactory.
- 19.2 The following testing of ARDEX WPM 001 was undertaken by the Commonwealth Scientific Industrial Research Organisation (CSIRO) Australia:
 - In accordance with ANSI A118.10 for ICBO Evaluation Service - dimensional stability, waterproofness, shear strength to ceramic tile and cement mortar, and fungal and micro-organism resistance.
 - In accordance with AS 1145 - behaviour under cyclic strain.
- 19.3 Testing of ARDEX WPM 001 and ARDEX WPM 002 has been undertaken by BRANZ for low temperature flexibility and peel adhesion after heat/humidity aging.
- 19.4 The following testing of ARDEX WPM 155 Rapid was undertaken by various organisations:
 - Durability testing to AS/NZS 4858 Appendix A including effect of heat aging, bleach, detergent and water on tensile strength and elongation.
 - Cyclic movement resistance requirements of AS/NZS 4858:2004 Appendix B.
 - Water vapour transmission using both wet and dry cup methods from ASTM E96.
 - Water transmission behaviour following the procedures of AS/NZS 4858 Appendix C.
- 19.5 The above test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 20.1 An assessment was made of the durability of ARDEX Undertile Liquid Membranes by BRANZ technical experts.
- 20.2 Site inspections were carried out by BRANZ to examine the practicability of installation.
- 20.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 21.1 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.
- 21.2 The quality management system of the membrane 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 ARDEX New Zealand Limited.
- 21.4 Quality on-site is the responsibility of the trained installers, approved by ARDEX New Zealand Limited.
- 21.5 Designers are responsible for the building design, and building contractors are responsible for the quality of installation of the framing system and substrate.
- 21.6 Building owners are responsible for the maintenance of the ceramic or stone tiles in accordance with the instructions of ARDEX New Zealand Limited.



Sources of Information

- AS 3958.1:2007 Ceramic Tiles – 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 4858:2004 Wet area membranes.
- BRANZ Bulletin No. 585 Measuring moisture in timber and concrete.
- BRANZ Good Practice Guide: Membrane Roofing (Second Edition), October 2015.
- BRANZ Good Practice Guide: Tiling (Third Edition), April 2015.
- NZS 3101:2006 Concrete structures standard.
- 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.



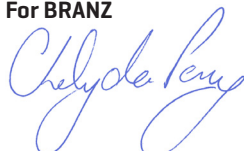
In the opinion of BRANZ, **ARDEX Undertile External Liquid Waterproofing Membranes** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to **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 Limited:**
 - 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 Limited**.
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 Limited** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

02 August 2022