



BRANZ Appraised

Appraisal No. 938 [2023]

WATERTIGHT ROOF UNDERLAY

Appraisal No. 938 [2023]

This Appraisal replaces BRANZ Appraisal No. 938 [2017]



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Watertight Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water-resistant polypropylene film laminated between two layers of spun-bonded polypropylene and is coloured grey.

Scope

- 2.1 Watertight Roof Underlay has been appraised for use as a roof underlay on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regard to building height and floor plan area; and,
 - with masonry tile roof cladding; and,
 - with metal tile roof cladding; and,
 - with profiled metal roof cladding; and,
 - situated in NZS 3604 Building Wind Zones up to, and including, Extra High.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Watertight Roof Underlay, if used, designed, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet or contribute to meeting the following provisions of the NZBC:

Clause B2 DURABILITY: Performance B2.3.1 [a] not less than 50 years, B2.3.1 [b] 15 years and B2.3.2. Watertight Roof Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the roof cladding system, Watertight Roof Underlay contributes to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Watertight Roof Underlay meets this requirement.

Technical Specification

- 4.1 Watertight Roof Underlay is a synthetic building underlay for use under roof claddings. The product consists of a micro-porous water-resistant polypropylene film laminated between two layers of spun-bonded polypropylene. Watertight Roof Underlay is coloured grey or white on the top and bottom faces.
- 4.2 Watertight Roof Underlay is supplied in rolls 2.74 m wide x 36.5 m long [100 m²]. The product is printed with the Watertight Roof Underlay logo repeated along the length of each roll. The rolls are wrapped in clear polythene film.

Accessories

- 4.3 Accessories used with Watertight Roof Underlay which are supplied by the installer are:
 - **Fixings** – stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the roof underlay to the framing.

Handling and Storage

- 5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
 - Techno Insulation Brochure Version 1.0, November 2017.
- 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 Watertight Roof Underlay is suitable for use at roof pitches 3° and above. When used at pitches less than 10°, Watertight Roof Underlay can be installed horizontally, or it can be installed vertically when fully supported by a corrosion resistant material. At pitches 10° and greater, Watertight Roof Underlay can be installed vertically [spanning no greater than 1,200 mm between supports], or horizontally.
- 7.2 Watertight Roof Underlay is intended for use as an alternative to conventional kraft paper roof underlays, which are fixed over timber or steel-framed roofs in order to limit the entry of wind into the roof cavity, and to assist in the moisture management of the roof cladding system.
- 7.3 The material also provides a degree of temporary weather protection during early construction. However, the product will not make the roof weathertight and some wetting of the underlying structure is always possible before the roof cladding is installed. Hence, the entire building must be closed-in and made weatherproof before moisture sensitive materials such as ceiling linings and insulation materials are installed.
- 7.4 Watertight Roof Underlay must not be exposed to the weather or ultraviolet [UV] light for a total of more than 7 days before being covered by the roof cladding.
- 7.5 Watertight Roof Underlay is suitable for use under roof claddings on buildings as a roof underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23. Refer to Table 1 for the material properties of Watertight Roof Underlay.

Table 1: NZBC E2/AS1, Table 23 Requirements

NZBC E2/AS1, Table 23 Roof Underlay Properties	Property Performance Requirement	Results
Absorbency	$\geq 150 \text{ g/m}^2$	Pass
Vapour Resistance	$\leq 7 \text{ MN s/g}$	Pass
Water Resistance	$\geq 100 \text{ mm}$	Pass
pH of Extract	≥ 5.5 and ≤ 8	Pass
Shrinkage	$\leq 0.5\%$	Pass
Mechanical	Edge tear and tensile strength	Edge tear [Average]: Machine direction = 112 N Cross direction = 93 N Tensile strength [Average]: Machine direction = 4.51 kN/m Cross direction = 3.21 kN/m

Structure

8.1 Watertight Roof Underlay is suitable for use in all Wind Zones of NZS 3604 up to, and including, Extra High.

Durability

9.1 Watertight Roof Underlay meets code compliance with NZBC Clause B2.3.1 (a) not less than 50 years for roof underlays used where the roof cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding, and code compliance with NZBC Clause B2.3.1 (b) 15 years for roof underlays used where the roof cladding durability requirement is 15 years.

Serviceable Life

9.2 Provided it is not exposed to the weather or UV light for a total of more than 7 days, and provided the roof cladding is maintained in accordance with the cladding manufacturer's instructions and the roof cladding remains weather resistant, Watertight Roof Underlay is expected to have a serviceable life equal to that of the roof cladding.

Control of Internal Fire and Smoke Spread

10.1 Watertight Roof Underlay has an AS 1530 Part 2 flammability index of no greater than 5 and therefore meet the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces. It may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

11.1 Separation or protection must be provided to Watertight Roof Underlay 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 Watertight Roof Underlay must only be used under roof claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or roof claddings covered by a valid BRANZ Appraisal.

12.2 Watertight Roof Underlay, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirement

- 13.1 All design and building work must be carried out in accordance with the Watertight Roof Underlay Technical Literature and this Appraisal by competent and experienced tradespersons conversant with Watertight Roof Underlay. Where the work involves Restricted Building Work (RBW) this must be completed by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant License Class.

Underlay Installation

- 14.1 Watertight Roof Underlay must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples, self-drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.
- 14.2 Watertight Roof Underlay may be installed horizontally or vertically at roof pitches 3° and above [refer to Paragraph 7.2 for further guidance]. It must extend from the ridge and overhang the fascia board by 20-25 mm. Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.4 Any damaged areas of Watertight Roof Underlay, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damage area by at least 150 mm and taping, or by taping small tears.

Inspections

- 14.5 The Technical Literature must be referred to during the inspection of Watertight Roof Underlay installations.

Basis of Appraisal

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

Test

- 15.1 The following tests have been carried out on Watertight Roof Underlay in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s. A range of these tests were completed before and after the underlay was exposed to UV light.
- 15.2 The flammability index of Watertight Roof Underlay has been evaluated in accordance with AS 1530.2.

Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 An evaluation of the expected performance of Watertight Roof Underlay in direct contact with metal roof cladding has been completed by BRANZ.
- 16.3 The practicability of installation of Watertight Roof Underlay has been assessed by BRANZ and found to be satisfactory.
- 16.4 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.



Quality

- 17.1 The manufacture of Watertight Roof Underlay has not been examined by BRANZ, but details of the methods adopted for quality control and the quality of the materials used, have been obtained and found to be satisfactory. BRANZ undertakes an ongoing review of product quality on an inwards goods basis.
- 17.2 The quality of supply to the market is the responsibility of Techno Wrapping Systems Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the roof underlay into their design in accordance with the instructions of Techno Wrapping Systems Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Techno Wrapping Systems Limited.

Sources of Information

- AS 1530.2:1993 Test for Flammability of Materials
- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp – cold extraction method.
- AS/NZS 4200.1:1994 Pliable building membranes and underlays – Materials.
- AS/NZS 4201.3:1994 Pliable building membranes and underlays – Methods of test – Shrinkage.
- AS/NZS 4201.4:1994 Pliable building membranes and underlays – Methods of test – Resistance to water penetration.
- AS/NZS 4201.6:1994: Pliable building membranes and underlays – Methods of test – Surface water absorbency.
- AS/NZS 4534:2006 Zinc and zinc/aluminium-alloy coatings on steel wire.
- 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.



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In the opinion of BRANZ, **Watertight Roof Underlay** 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 **Techno Wrapping Systems 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. **Techno Wrapping Systems 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 **Techno Wrapping Systems 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 **Techno Wrapping Systems Limited** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

06 April 2023