



**BRANZ Appraised**

Appraisal No.547 [2007]

BRANZ Appraisals

Technical Assessments of products  
for building and construction

**BRANZ  
APPRAISAL  
No. 547 (2007)**

Amended 31 January 2012

## **NURAPLY ROOF AND DECK MEMBRANES**

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## Product

1.1 Nuraply Roof and Deck Membranes are waterproofing membranes for nominally flat, pitched and curved roofs, gutters, parapets and decks. They are installed as a multi layer system with either a mineral chip finished product or a sand finished layer with UV protective paint as the top layer if exposed to UV light, or as a single layer system onto a concrete substrate under heavy protection such as paving slabs or a topping screed.

1.2 The products are supplied as reinforced, polymer-modified bitumen sheets in roll form that are cold glued/heat welded to the substrate with heat welded joints.



## Scope

2.1 Nuraply Roof and Deck Membranes have been appraised as roof and deck waterproofing membranes 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 roof and deck supporting structures of timber framing with substrates of plywood or fibre cement sheet; and,
- with substrates of suspended concrete slabs; and,
- situated in NZS 3604 Wind Zones, up to, and including 'Extra High'; and,
- with decks that have a maximum area of 40 m<sup>2</sup>.

2.2 Nuraply Roof and Deck Membranes have also been appraised for use as roof and deck waterproofing membranes on specifically designed buildings within the following scope:

- with building structures designed and constructed to comply with the NZBC; and,
- with roof and deck supporting structures of timber framing with substrates of plywood or fibre cement sheet; and,
- with substrates of suspended concrete slab; and,
- subjected to maximum wind pressures (Refer Paragraph 8.1); 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 Roofs and decks waterproofed with Nuraply Roof and Deck Membranes must be designed and constructed in accordance with the following limitations:

- nominally flat, curved or pitched roofs and decks constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
- constructed to suitable falls (Refer Paragraph 14.3 and 14.4); and,
- with no integral roof gardens; and,
- no steps in level within the deck area, except into gutters; and,
- no downpipes direct discharge to decks; and,
- with membranes protected from physical damage or UV light by ceramic or stone tile finishes or timber, resting on Nuralite approved pedestal supports.

2.4 The design and construction of the substrate and movement and control joints is specific to each building, and therefore is the responsibility of the building designer and building contractor and is outside the scope of this Appraisal.

2.5 The membranes must be installed by Nuralite Waterproofing Ltd Licensed and Trained Installers.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Nuraply Roof and Deck 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. Nuraply Roof and Deck Membranes meet this requirement. See Paragraph 10.1. Performance B2.3.1 (c), 5 years. Nuracolour and Nuracoat B.A.C meet this requirement. See Paragraph 10.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1 and E2.3.2. Nuraply Roof and Deck Membranes meet these requirements. See Paragraphs 14.1 – 14.9.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Nuraply Roof and Deck 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. The membranes are an alternative to the membranes specified in NZBC Acceptable Solution E2/AS1, and an Alternative Solution subject to specific design for other buildings not covered within E2/AS1.

## Technical Specification

4.1 Materials supplied by Nuralite Waterproofing Ltd are as follows:

### Nuraply 3P Membrane

- 3 mm thick modified bitumen, cold glued/heat welded with heat welded joints sheet waterproofing membrane with a sanded upper surface, finished in Nuracolour when used as a cap sheet in a double layer system or protected by paving slabs or topping screeds when used as a single layer on a concrete substrate. Supplied in 1 m wide x 10 m long rolls.

### Nuraply 3PM Membrane

- 4 mm thick modified bitumen sheet waterproofing membrane with an upper layer mineral chip. It is applied by cold glued/heat welded with heat welded joints as a fully heat welded cap sheet in a double layer system over Nuraply 3P or Nurabasesheet. Supplied in 1 m wide x 7.5 m long rolls.

### Nuraply 3PV Membrane

- 4 mm thick modified bitumen sheet waterproofing and ventilating membrane with a sand upper surface used as a base layer in a double layer system. It is applied by heat welding with heat welded lap joints and has a 40% bond pattern to provide a vapour diffusion layer in the base of the material. This is used to avoid vapour blisters forming under the membrane from moisture in the substrate below. Supplied in 1 m wide x 7.5 m long rolls.

### Nuraply 3PB

- 3 mm thick modified bitumen sheet waterproofing membrane with top and underside surfaced with talc for use as a base layer only in a double layer system. It is applied by cold glued/heat welded and heat welding between the sheets. Supplied in 1 m wide x 10 m long rolls.

### Nurabond No. 10

- Water based adhesive for bonding Nuraply roofing systems to all substrates. It is coloured black and applied by brush or roller and is supplied in 20 litre containers.

### Nuraflex Primer

- A bitumen based primer for substrates when required, prior to the installation of the membrane. It is available in 20 litre containers.

### Nuracolour

- Is an acrylic coating used as a finish over Nuraply 3P to complete the system and provide long term durability. Used as a two coat system applied by airless spray or roller. It is supplied in 20 litre containers.

### Nuracoat B.A.C

- Is a solvent-based, bituminous aluminium solution containing laminar aluminium flake for protecting sand finished membranes from UV attack. It is supplied in 25 litre drums.

Table 1: Membrane Systems

System	Single Layer	Double Layer	Protection Required
Nuraply 3P Membrane	3.0 mm		Paving Slabs/ topping screed
Nuraply 3P Membrane		3.0 mm Nurabasesheet base layer with 3.0 mm top layer	Nuracolour/ Nuracoat B.A.C
Nuraply 3PV Membrane		4.0 mm Nuraply 3PV base layer with 3.0 mm Nuraply 3P top layer or Nuralite 3PM Membrane	Nuracolour/ Nuracoat B.A.C/ or standard finish of material
Nuraply 3PM Membrane		3.0 mm Nurabasesheet base layer or Nuralite 3P with 4.0 mm top layer	Standard finish of material

## Handling and Storage

5.1 Handling and storage of all materials whether on or off site is under the control of the Nuralite Waterproofing Ltd Licensed and Trained Installers. Dry storage must be provided for all products and the rolls of membrane must be stored in an upright position.

## Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Nuraply Roof and Deck 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 Nuraply Roof and Deck Membranes are for use on roofs, gutters, parapets and decks where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas. The products can be used on new or existing buildings. Nuralite Waterproofing Ltd should be consulted as to the suitability of any existing substrates prior to using Nuraply Roof and Deck Membranes.

7.2 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membranes. Refer to BRANZ publication "Good Practice Guide - Membrane Roofing".

7.3 The 3.0 mm Nurabasesheet membrane is designed for use on roofs, gutters and decks as the first layer of a double layer system and all areas requiring detailing such as upstands, protrusions, rainwater heads and outlets. The Nuraply 3PM membrane is used as the top layer of a double layer system, see Table 1.

## Structure

8.1 Nuraply Roof and Deck Membranes fully bonded double layer systems are suitable for use in areas subject to maximum wind pressures of 6 kPa Ultimate Limit State.

## Substrates

### Plywood

9.1 Plywood must be treated to H3 (CCA treated). **LOSP treated plywood must not be used.** Plywood must comply with NZBC Acceptable Solution E2/AS1 Paragraph 8.5.3 and 8.5.5. Where specific design is used (i.e. outside the scope of E2/AS1) the plywood thickness and fixing size may increase and centres may decrease to meet specific wind loadings. 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 all sheet edges are fully supported.

### Concrete

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

### Fibre Cement Sheet

9.3 Fibre cement compressed sheet must be manufactured to comply with the requirements of AS 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, such as deflection from gravity and live loads. Installation must be in accordance with instructions of the manufacturer.

### Existing Construction

9.4 A thorough inspection of the substrate must be made to ensure it is in fit condition and does not contain any materials that will adversely affect the performance of the membrane.

9.5 Repairs must be undertaken, where applicable, to ensure the substrate is sound, the joints are sealed, and the flashings are sound. Plywood substrates must be checked for screw fixings, and if necessary refixed as for new plywood.

## Durability

### Serviceable Life

10.1 Nuraply Roof and Deck Membranes are expected to have a serviceable life of at least 15 years, provided they are designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

10.2 Nuracolour and Nuracoat B.A.C are expected to have a serviceable life of at least 5 years provided they are used, installed and maintained in accordance with this Appraisal and the Technical Literature.

### Chemical Resistance

10.3 Industrial air pollutants and windborne salt deposits should not significantly affect the durability of the membranes. However, the long term properties of the material may be affected by contact with petroleum-based products such as oils, greases and solvents.

## Maintenance

11.1 The membrane roof and deck systems, including any areas with a UV coating applied, must be regularly (at least annually) checked for damage, rubbish and debris or coating breakdown. Damage, such as small punctures and tears must be repaired and coatings reapplied as recommended by Nuralite Waterproofing Ltd.

11.2 Special care must be taken when inspecting the membrane roof and deck systems to ensure the continuing prevention of moisture ingress, and repairs must be undertaken where required.

11.3 Drainage outlets must be maintained to operate effectively.

## Outbreak of Fire

12.1 Separation or protection must be provided to the membranes and plywood substrate from heat sources such as flues and chimneys.

12.2 NZBC Acceptable Solution C/AS1 Part 9 and Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

## Spread of Fire

13.1 The membranes may be used on roofs and decks of buildings intended for all Purpose Groups, including SC and SD, subject to the requirements of NZBC Acceptable Solution C/AS1 Part 7, Paragraph 7.11.1.

13.2 The membranes may be used for cladding fire-rated roof construction, providing the roof construction complies with the requirements of NZBC Acceptable Solution C/AS1 Part 7.

## External Moisture

14.1 Roofs and decks 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 given by the Technical Literature which aligns with details in NZBC Acceptable Solution E2/AS1.

14.2 When installed in accordance with this Appraisal and the Technical Literature, Nuraply Roof and Deck 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 roof or deck.

14.3 Roof and deck falls must be built into the substrate and not created with mortar screeds applied over the membrane.

14.4 The minimum fall to roofs is 1 in 30, decks is 1 in 40 and gutters are 1 in 100. All falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane. *(Note: Where possible a fall of 1 in 60 in the gutters is preferred.)*

14.5 Allowance for deflection and settlement of the substrate must be made in the design of the roof or deck to ensure falls are maintained and no ponding of water can occur.

14.6 Nuraply Roof and Deck 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.

14.7 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 roof does not drain to an external gutter or spouting.

14.8 Penetrations and upstands of the membranes must be raised above the level of any possible flooding caused by the blockage of roof or deck drainage.

14.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

## Water Supplies

15.1 Nuraply Roof and Deck Membranes have not been assessed for roofs used for the collection of potable water.

## Installation Information

### Installation Skill Level Requirement

16.1 Installation of the membranes must be completed by Nuralite Waterproofing Ltd Licensed and Trained Installers.

16.2 Installation of substrates must be completed by tradespersons with an understanding of roof construction, in accordance with instructions given within the Nuralite Waterproofing Ltd Technical Literature and this Appraisal.

### Preparation of Substrates

17.1 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.

17.2 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. 424.

17.3 The moisture content of the plywood and timber substructure must be a maximum of 20% and the plywood and fibre cement sheets must be dry at time of membrane application. This will generally require plywood and fibre cement sheets to be covered until just before the membrane is laid, to prevent rain wetting.

17.4 Concrete substrates must be primed with Nuraflex Primer and left to dry (4-5 hours) before the membrane is installed.

17.5 Plywood substrates must be coated with Nurabond #10 at a rate of 2m<sup>2</sup> per litre. The membrane may then be installed immediately.

## Membrane Installation

18.1 The membranes must be installed in accordance with the Technical Literature.

18.2 All roof, deck and wall junctions must have a 20 mm x 20 mm wooden fillet installed at the junction. Concrete substrate junctions must have a 20 mm x 20 mm cement mortar fillet installed. All external edges must be chamfered to a 5 mm radius to remove sharp edges.

18.3 The membrane must be unrolled without tension onto the prepared substrate and allowed to 'relax' for at least 30 minutes prior to installation.

18.4 The membrane is installed from the lowest point and each layer is installed across the roof fall allowing a 100 mm side overlap and a 150 mm end overlap. When a double system is being installed, the cap sheet layer must be offset against the base sheet layer.

## Inspections

19.1 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.

## Health and Safety

20.1 Safe use and handling procedures for Nuraply Roof and Deck Membranes are provided in the Technical Literature. The products must be used in conjunction with the relevant Material Safety Data Sheets for each membrane.

## Basis of Appraisal

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

### Tests

21.1 The following is a summary of the testing and test reports on Nuraply Roof and Deck Membranes:

- Assessment by Belgian Union for Technical Agreements in Building Systems (BUtgb) and granted "Technical Approval with Certification" under ATG certificate numbers 06/1654 and 06/2323. The testing covered tensile strength, elongation, peel resistance (joints), joint strength, low temperature flexibility, fatigue resistance, nail hold, resistance to heat aging, static load, indentation resistance and peel resistance (substrate).

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

### Other Investigations

22.1 A durability opinion has been provided by BRANZ technical experts.

22.2 Installation of the membranes has been assessed by BRANZ for practicability of installation and found to be satisfactory.

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

## Quality

23.1 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.

23.2 The quality of the supply of products to the New Zealand market is the responsibility of Nuralite Waterproofing Ltd.

23.3 Quality on site is the responsibility of the Nuralite Waterproofing Ltd Trained and Approved Installers.

23.4 Designers are responsible for the building design, and building contractors are responsible for the quality of construction of substrate systems in accordance with the instructions of Nuralite Waterproofing Ltd and this Appraisal.

23.5 Building owners are responsible for the maintenance of the membrane systems in accordance with the instructions of Nuralite Waterproofing Ltd and this Appraisal.

## Sources of Information

- AS/NZS 1170: 2002 Structural design actions - General principles.
- AS/NZS 2269: 2008 Plywood – structural.
- NZS 3101: 2006 The design of concrete structures.
- NZS 3604: 2011 Timber-framed buildings.
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition July 2005 (Amendment 5, 1 August 2011).
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.
- BRANZ Good Practice Guide - Membrane Roofing reprint October 2003.

### Amendment No. 1, dated 1 September 2009.

This Appraisal has been amended to update multi-layer versus single-layer references and include decks.

### Amendment No. 2, dated 31 January 2012.

This Appraisal has been amended to update clause changes as required by the introduction of NZS 3604: 2011 and NZBC Acceptable Solution E2/AS1 Third Edition, Amendment 5.



**BRANZ**

**In the opinion of BRANZ, Nuraply Roof and Deck 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 the Appraisal Holder, Nuralite Waterproofing Ltd, and is valid until further notice, subject to the Conditions of Certification.**

### Conditions of Certification

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. The Appraisal Holder:
  - 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.
3. The product and the manufacture are maintained at or above the standards, levels and quality assessed and found satisfactory by BRANZ.
4. BRANZ makes no representation 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 the Appraisal Holder.
5. 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.

For BRANZ

P Robertson  
Chief Executive

Date of issue: 6 August 2007