BRANZ Appraised
Appraisal No. 1177 [2021]

NURAPLY TPO WATERPROOFING MEMBRANE

Appraisal No. 1177 (2021)

BRANZ Appraisals

Technical Assessments of products for building and construction.

Nuralite Waterproofing Ltd
60d Leon Leicester Ave
Mt Wellington
Auckland
Tel: 09 579 2046
Web: www.nuralite.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 Nuraply TPO Membrane is a single-ply, polyester fabric reinforced, thermoplastic polyolefin (TPO) fully bonded waterproofing sheet membrane for roofs and decks.

Scope

2.1 Nuraply TPO Membrane has been appraised as a roof and deck waterproofing membrane on 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 structural design; and,
- with substrates of plywood, Strandsarking (roofs only) or suspended concrete slab; and,
- with minimum falls for plywood roofs of 1:30, decks of 1:40, concrete roofs of 1:60; and,
- with deck size limited to 40 m^2 (refer to Paragraph 7.6); and,
- situated in NZS 3604 Wind Zones up to, and including, Extra High.

2.2 Nuraply TPO Membrane has also been appraised as a roof and deck waterproofing membrane on buildings within the following scope:

- subject to specific structural and weathertightness design and,
- with substrates of plywood, Strandsarking (roofs only) or suspended concrete slab; and,
- situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 6 kPa; and,
- with the weathertightness design of junctions for each specific structure being the responsibility of the building designer.

2.3 Roofs and decks waterproofed with Nuraply TPO Membrane must be designed and constructed in accordance with the following limitations:

- nominally flat roofs and decks and pitched roofs constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
- with no steps within the deck level, no integral roof gardens and no downpipes directly discharging to decks; and,
- with the deck membrane continually protected from physical damage by a pedestal protection system.

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 membrane must be installed by Nuralite Waterproofing Ltd approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

3.1 **In the opinion of BRANZ, Nuraply TPO 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. Nuraply TPO Membrane meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1, E2.3.2 and E2.3.6. Roofs incorporating Nuraply TPO Membrane meet these requirements. See Paragraphs 13.1–13.4.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Nuraply TPO Membrane meets this requirement.

Technical Specification

4.1 Materials supplied by Nuralite Waterproofing Ltd are as follows:

- **Nuraply TPO Membrane** - a fully-adhered, polyester fabric reinforced, multi-layer, synthetic roof waterproofing sheet based on thermoplastic polyolefin (TPO). It is supplied in grey or white rolls either 1.14, 1.52 or 2 mm thick, 1.52, 2.44 or 3.05 m wide and 30.4 m long.
- **Nuraply TPO FB Membrane -** a fully-adhered, polyester fabric reinforced, multi-layer, synthetic roof waterproofing sheet based on TPO with a fleece backing. It is supplied in white rolls 3 mm thick, 3.05 m wide and 30.4 m long.
- **Vent tapes** – PVC bond breaker tapes for plywood joints to allow movement over substrate joints and air travel underneath the membrane or used in a grid pattern at 600 mm centres over concrete to allow air movement to exit to vents. They are supplied in 30 mm widths.
- **Nuraply TPO Weathered Membrane Cleaner** – a cleaner designed for cleaning aged, dirty or weathered membranes.
- **Nuraply TPO Contact Adhesive** – a high strength, solvent-based contact adhesive that is used to bond the Nuraply TPO Membrane to various porous or non-porous substrates. It is supplied as an opaque liquid in 19 L containers.
- **Nuraply Single Ply Caulk** – a one-part elastomeric sealant, specially formulated for TPO edge sealing. It is used to seal edges around flashing terminations. It is coloured white and is supplied in 304.6 ml cartridges.
- **Nuraply TPO Pourable Sealer** – a two-part polyurethane sealant used as a penetration pocket filler. It is a grey colour and is supplied in a 4.26 L kit.
- **Nuraply TPO Penetration Pocket** – a two piece moulded TPO pocket used to seal uneven penetrations. It is coloured white and is supplied as a 190 x 150 oval.
- **Nuraply TPO Detail Membrane** – a weldable unreinforced TPO for corner, detail and flashing areas. It is supplied as a roll 300 m wide.
- **Nuraply TPO Preformed Corners and T Joint Patches** – flexible, non-reinforced TPO detailing accessories. They are available in white, grey and tan.
- **Nuraply TPO Pipe Boots** – flexible, smooth, non-reinforced TPO cone-shaped boots with a preformed flange. They are coloured white, grey or tan and supplied in 25.4 mm to 152.4 mm diameter boots.
- **Nuraply TPO Pipe Boots (Peel & Stick)** – flexible, smooth, non-reinforced TPO cone-shaped boots with a preformed flange with a pressure sensitive tape on the underside. They are coloured white, grey or tan and supplied in 25.4 mm to 152.4 mm diameter boots.
- **Nuraply TPO Peel & Stick 6" Reinforced Perimeter Strip** – a reinforced TPO membrane with a factory applied peel and stick adhesive tape on the upper face. It is coloured white and is supplied in rolls 152 mm wide and 30.48 m long.

- **Nuraply TPO Cover Tape** – a non-reinforced TPO detailing tape with a peel and stick adhesive backing. It is coloured white, grey or tan and is supplied in rolls 152.4 or 250 mm wide and 30.48 m long.
- **Nuralite Butyl Tape** - 1 mm thick, single-sided butyl tape with a polypropylene fleece face. It is mostly grey in colour and is designed to bond permanently to most surfaces including TPO.

Handling and Storage

5.1 Handling and storage of all materials whether on-site or off-site is under the control of the Nuralite Waterproofing Ltd approved applicators. Dry storage must be provided for all products and the rolls of membrane must be lying down on pallets and protected.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Nuraply TPO 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 Nuraply TPO Membrane is for use on roofs, decks, balconies, gutters and parapets where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.

7.2 Nuraply TPO Membrane can be adversely affected by contact with bituminous substances. Nuralite Waterproofing Ltd should be contacted for advice in this situation.

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 Where regular foot traffic on the roof is envisaged i.e. maintenance of lift equipment, a walkway should be installed to ensure the membrane is protected. The Nuraply TPO Membrane is designed for limited, irregular pedestrian access only.

7.5 The Nuraply TPO Membrane, when used on decks, requires a pedestal protection system. Nuralite Waterproofing Ltd should be contacted for the best system to meet design requirements.

7.6 NZBC Acceptable Solution E2/AS1 limits the size of decks to 40 m^2. Nuraply TPO Membrane is suitable for use on decks larger than 40 m^2. These decks are the subject of specific design in accordance with Paragraph 2.2.

Structure

8.1 Timber framing systems 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.

8.2 Nuraply TPO Membrane fully bonded is suitable for use in areas subject to maximum wind pressure of 6 kPa ULS, subject to the limitations of the substrate.

Substrates

Plywood

9.1 Plywood must be treated to H3 (CCA treated). LOSP treated plywood must not be used. 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.

Strandsarking

9.2 Strandsarking must be installed in accordance with the manufacturer's instructions and BRANZ CodeMark CM-1006 Rev 1.

Concrete

9.3 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

10.1 Nuraply TPO Membrane, when subjected to normal conditions of environment and with proper maintenance, can expect to have a serviceable life of at least 15 years.

Maintenance

11.1 Maintenance requirements of the membrane are provided by Nuralite Waterproofing Ltd.

11.2 In the event of damage to the membrane, it must be repaired by removing the damaged portion and applying a patch as for new work.

11.3 Drainage outlets must be maintained to operate effectively.

Prevention of Fire Occurring

12.1 Separation or protection must be provided to the Nuraply TPO Membrane from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

13.1 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.

13.2 When installed in accordance with this Appraisal and the Technical Literature, Nuraply TPO 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 roof or deck.

13.3 The minimum fall for plywood roofs is 1 in 30, concrete roofs is 1:60, for decks is 1 in 40 and for gutters is 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.

13.4 Nuraply TPO 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.

13.5 Roof and deck falls must be built into the plywood substrate.

13.6 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.

13.7 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.

13.8 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

14.1 All design and building work must be carried out in accordance with the Nuraply TPO Membrane Technical Literature and this Appraisal. Installation of the membrane must be undertaken by Nuralite Waterproofing Ltd approved applicators. Where the work involves Restricted Building Work this must also be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License Class.

Preparation of Substrates

15.1 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.

15.2 Concrete substrates can be checked for dryness by using a hygrometer, as set out in BRANZ Bulletin No. 585. The relative humidity of the concrete must be 75% or less before membrane application.

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

Membrane Installation

16.1 The installation of this membrane system is very complex and limited to approved applicators only. The Nuralite Waterproofing Ltd Application Manual should be referred to in all instances for the correct procedures.

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 Technical Literature instructions.

Health and Safety

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

Basis of Appraisal

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

Tests

19.1 Testing has been carried out on the membrane for elongation, tensile strength, seam strength, breaking strength, low temperature, resistance to aging, water absorption, resistance to ultraviolet [UV] light and peel adhesion to plywood and concrete.

19.2 Test methods and results have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

20.1 A durability opinion has been given of the Nuraply TPO Membrane by BRANZ technical experts.

20.2 Site inspections have been carried out by BRANZ to assess 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 Nuraply TPO Membrane 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 of supply of the product to the market is the responsibility of Nuralite Waterproofing Ltd.

21.3 Quality on-site is the responsibility of the Nuralite Waterproofing Ltd approved applicators.

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

Sources of Information

- AS/NZS 1170: 2002 Structural Design action – general principles.
- AS/NZS 2269: 2012 Plywood – Structural.
- BRANZ Bulletin No. 585 Measuring Moisture in Timber and Concrete, June 2015.
- BRANZ Good Practice Guide – Membrane Roofing, October 2015.
- 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.

BRANZ

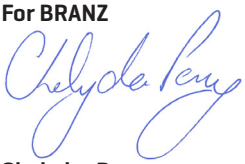
In the opinion of BRANZ, Nuraply TPO Waterproofing Membrane is fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided it is used, designed, installed and maintained as set out in this Appraisal.

The Appraisal is issued only to Nuralite Waterproofing 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. Nuralite Waterproofing 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 Nuralite Waterproofing 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 Nuralite Waterproofing Ltd or any third party.

For BRANZ



Chelydra Percy
Chief Executive

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