



BRANZ Appraised
Appraisal No. 1233 [2024]

ARDEX WARM ROOFING SYSTEM

Appraisal No. 1233 [2024]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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BRANZ

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Product

- 1.1 The ARDEX Warm Roofing System is an insulating, waterproof roofing system for limited access, low slope roofs and protected decks with concrete, timber, or steel substrates. It consists of a thermal insulation layer and various waterproofing membranes as a roof or deck finish.

Scope

- 2.1 The ARDEX Warm Roofing System has been appraised for use as an insulating roof or deck on buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and maximum floor plan areas; and,
 - on limited access flat roofs with concrete, timber or steel structural decks subject to specific structural design; and,
 - with roofs and decks constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
 - with roofs and decks constructed to suitable falls [refer to Paragraphs 15.3 and 15.4]; and,
 - with no steps within the deck, no integral roof gardens and no downpipes directly discharging to the deck; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 The ARDEX Warm Roofing System has also been appraised for durability and thermal performance as insulated roof and deck system on buildings that are the subject of specific design with no building height restriction. Building designers are responsible for the building design and for the incorporation of ARDEX Warm Roofing System into their design in accordance with the declared properties and instructions of ARDEX New Zealand Limited.
- 2.3 The ARDEX Warm Roofing System must be installed by ARDEX New Zealand Limited approved and trained installers.



Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the ARDEX Warm Roofing System, if designed, used, 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 [b] 15 years. The ARDEX Warm Roofing System meets this requirement. See Paragraphs 10.1 and 10.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. The ARDEX Warm Roofing System meets these requirements. See Paragraphs 15.1–15.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The ARDEX Warm Roofing System meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a]. The ARDEX Warm Roofing System contributes to meeting this requirement. See Paragraph 14.1.

Technical Specification

4.1 The ARDEX Warm Roofing System is an insulating roofing system for flat roofs and decks. The thermal layer is a polyisocyanurate board available in a number of thicknesses to suit design requirements. The insulation board is mechanically fastened or fully bonded on limited access flat roofs and decks constructed of concrete or timber and mechanically fastened to steel substrates. The roof and deck finishes are modified bitumen, TPO, Butynol, or Weldtec waterproofing membranes which are either torch-applied or adhesive-fixed to the insulation board.

4.2 Materials supplied by ARDEX New Zealand Limited are as follows:

Butynol® Membranes

- **Butynol® Membranes** - all membranes are single-ply, flexible, synthetic rubber membranes. They are supplied in rolls nominally 1.4 m wide by 17.86 m long. Each roll is packed in polythene wrapper trademarked 'Butynol®' with the thickness identified. Thicknesses available are 1, 1.5 and 2.25 mm in black; 1.2 mm in grey; and 1.5 mm in various colours.
- **Butyseal Membrane** - a single-ply, flexible, synthetic rubber membrane with polypropylene filaments welded to the underside. It is supplied in rolls nominally 1.4 m wide by 17.86 m long. The total thickness of the membrane is 1.5 mm.

Torch-on Membranes

- **ARDEX WPM 117 Membrane** - a 2 mm thick, self-adhesive bituminous membrane with a thermo-fusion film backing. It is designed to be used as a base layer on heat-sensitive substrates.
- **ARDEX Duo Mineral Membrane WPM 189** - a 4 mm thick [excluding the slate finish] SBS/APP plastomeric-type modified bitumen torch-on membrane with a mineral top surface and an embossed bottom surface protected by a heat-sensitive polythene film. It is designed to be used as the cap layer and is available in various colours.

Primers

- **ARDEX WPM 240** - a solvent-based, bitumen-modified, clear or black liquid primer available in 5 and 20 L cans.
- **ARDEX WPM 247** - a water-based, bitumen-modified, black liquid primer available in 5 and 20 L containers.

TPO Membranes

- **Elevate UltraPly™ TPO 1.5 mm Membrane** - a fully adhered roof and deck waterproofing system based on a TPO sheet, with non-halogenated flame retardants laminated around a polyester weft reinforcement. It is supplied in grey or white, in rolls 1.5 mm thick, 3 m wide and 30.5 m long.
- **Elevate UltraPly™ TPO 1.14 mm Membrane** - a fully adhered roof and deck waterproofing system based on a TPO sheet, with non-halogenated flame retardants laminated around a polyester weft reinforcement. It is supplied in grey or white rolls 1.14 mm thick, 3 m wide and 30.5 m long.

Weldtec Membranes

- **ARDEX WPM 712** - a weldable waterproofing membrane with properties which resist ageing from heat, sunlight and ozone. It is supplied in black rolls 1.2 mm thick, 1.4 m wide and 20 m long.
- **ARDEX WPM 715** - a weldable waterproofing membrane with properties which resist ageing from heat, sunlight and ozone. It is supplied in black or grey rolls 1.5 mm thick, 1.4 m wide and 20 m long.

Vapour Barriers

- **ARDEX WPM 3000X** - a self-adhesive bituminous waterproofing membrane which is self-protected by a cross-laminated high-density polyethylene (HDPE) film.
- **ARDEX WPM 117 Membrane** - a 2 mm thick, self-adhesive bituminous membrane with a thermo-fusion film backing. It is designed to be used as a base layer on heat-sensitive substrates.

Polyiso Insulation

- **ARDEX Polyiso Insulation** - a flat board roofing insulation consisting of a closed-cell polyiso foam core laminated to glass reinforced mat facer on both sides. It is available in flat board of 1.2 x 2.4 m and in thicknesses ranging from 52-140 mm.

Adhesives

- **ARDEX I.S.O Twin Pack Insulation Adhesive** - a two-component low-rise polyurethane adhesive for anchoring roof insulation.
- **ARDEX Spray Bonding Adhesive BA-2012 -S/TF** - a sprayable solvent-based contact adhesive for bonding TPO membranes to approved insulations as well as wood, metal, and masonry.

Fasteners and Seam Plates

- **Elevate All Purpose Fastener** - a mechanical fastener for use with ARDEX TPO membranes and roof insulation (using acceptable insulation fastening plates) to steel, plywood, and timber decks.
- **Elevate Insulation Fastening Plates** - seam plates for use in roofing applications with ARDEX Polyiso Insulation.
- **Elevate Heavy Duty Fasteners** - a mechanical fastener specifically designed to be used in roofing applications requiring additional corrosion protection and pull-out resistance.
- **Elevate HD Seam Plates** - seam plates specifically designed for use with ARDEX TPO membranes to approved substrates in conjunction with Elevate All Purpose Fasteners.
- **EJOT KTH 2G Fasteners** - a mechanical fastening system combining a stainless steel fastener and plastic tube washer for improved thermal performance.

Handling and Storage

- 5.1 Handling and storage of all materials whether on-site or off-site is under the control of the ARDEX New Zealand Limited approved and trained installers. Dry storage must be provided for all products and the rolls of membrane must be stored in the correct position.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
 - ARDEX Warm Roofing - ARDEX Membrane Drawing List - Version 1 January 2024.
 - ARDEX Polyiso Insulation Data Sheet - 2024.
 - ARDEX Warm Roofing Solutions H1 Energy Efficiency - March 2024.
 - Technical Literature as specified in the applicable BRANZ Appraisals for individual components and membranes.
- 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.
- 6.3 Additional guidance on specific install information and supplied materials may be found in the BRANZ Appraisals of each individual component.

Design Information

General

- 7.1 The ARDEX Warm Roofing System is a roof and deck system that provides thermal insulation and waterproofing. It is intended for use on protected decks and limited access flat roofs that are subject only to light foot traffic for maintenance purposes. The insulation board is mechanically fastened or fully bonded on limited access flat roofs and decks constructed of concrete or timber and mechanically fastened to steel substrates
- 7.2 The ARDEX Warm Roofing System can be used on new or existing roofs and decks subject to the suitability of the substrate of existing roofs.
- 7.3 The waterproofing membrane systems are either fully-bonded, adhesive-fixed Butynol, TPO and Weldtec membranes with heat welded joints, or double-layer, torch-applied, modified bitumen membranes.
- 7.4 The ARDEX Warm Roofing System can be installed with one of two vapour control membranes:
- **ARDEX WPM 117** - self-adhesive and applied over the structural deck before the installation of the insulation board.
 - **ARDEX WPM 3000X** - self-adhesive and applied over the structural deck before the installation of the insulation board.
- 7.5 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.

Structure

- 8.1 The ARDEX Warm Roofing System is suitable for buildings situated in NZS 3604 Wind Zones up to, and including, Extra High. Minimum fixings per square meter are given in the table below:

Sheet	Fixing Type	Fixings per square metre for NZS 3604 Wind Zones					Fixing Capacity for SED [kN]
		L	M	H	VH	EH	
Polypropylene-faced sheets, polyiso core, minimum 52 mm thick	Plastic washers [EJOT HTK 2G 16], minimum 48 mm diameter	2	2	3	4	5	0.82
Aluminium-faced sheets, polyiso core, minimum 52 mm thick	Plastic washers [EJOT HTK 2G 16], minimum 73 mm diameter or Steel washers [Elevate Insulation Fastening Plates], minimum 75 mm diameter	1	1	2	2	3	1.47

Note - Fixings per square metre are for use in buildings within the scope of NZS 3604. Fastener spacings for SED are to be determined by a structural engineer. Screw holding into substrates must be equal to or exceed the stated fixing capacity.

- 8.2 For buildings subject to specific design, the structural designer must confirm that mechanical fixings have adequate fixing capacity to the substrates.

Substrates

Plywood

- 9.1 Plywood must be treated to H3 [CCA treated]. LOSP treated plywood must not be used. Plywood must be a minimum of 17 mm to comply with AS/NZS 2269, at least CD Grade Structural, with the sanded C face upwards.

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.

Steel

- 9.3 The steel substrate must be G550 aluminium-zinc AZ150 to AS1397.

Existing Construction

- 9.4 A thorough inspection of the substrate must be made to ensure it is in fit condition.
- 9.5 Repairs must be undertaken, where applicable, to ensure the substrate is sound. Plywood and steel substrates must be checked for screw fixings, and if necessary, refixed as for new plywood and steel.

Durability

Serviceable Life

- 10.1 The ARDEX Warm Roofing System is expected to have a serviceable life of at least 15 years, provided it is designed, used, installed and maintained in accordance with this Appraisal and the Technical Literature.

Chemical Resistance

- 10.2 Industrial air pollutants and windborne salt deposits should not significantly affect the durability of the membrane. 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 system, including any areas with an ultraviolet (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 ARDEX New Zealand Limited.
- 11.2 Special care must be taken when inspecting the membrane roof system 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.

Prevention of Fire Occurring

- 12.1 Separation or protection must be provided to the ARDEX Warm Roofing System from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Control of Internal Fire and Smoke Spread

- 13.1 The ARDEX Warm Roofing system includes ARDEX Polyiso Insulation board [foamed plastic] and therefore requires a suitable interior surface finish for the completed system to achieve the required Group Number as specified in NZBC Acceptable Solution C/AS1, Paragraph 4.2.2.1 or NZBC Acceptable Solution C/AS2, Paragraph 4.17.2 and Table 4.3.
- 13.2 Where the system is installed over a metal roofing, this will not meet the interior surface finish requirements alone and will need to be protected by an interior surface finish to achieve the required Group Number as specified in NZBC Acceptable Solution C/AS1, Paragraph 4.2.2.1 or NZBC Acceptable Solution C/AS2, Appendix A, Paragraph A1.7 and Table 4.3.
- 13.3 NZBC Verification Method C/VM2, Appendix A, Section A1.5 provides interior surface finish specified performances for some substrate and coating combinations, including concrete, sheet metal, fibre cement, gypsum plasterboard and wood substrates.

- 13.4 Substrates need to be well fixed with joints supported and sealed or stopped with a non-flaming material to manufacturers specifications. The design and specification of the interior surface finish is outside the scope of this Appraisal and the responsibility of the building's designer or fire engineer.

Energy Efficiency

- 14.1 Thermal resistance [R-value] of building elements may be verified by using NZS 4214. The R-value for the 80 mm ARDEX Polyiso Insulation is R3.4.

External Moisture

- 15.1 Roofs 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 in the Technical Literature which aligns with details in NZBC Acceptable Solution E2/AS1.
- 15.2 When installed in accordance with this Appraisal and the Technical Literature, the ARDEX Warm Roofing System 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.
- 15.3 Roof and deck falls must be built into the substrate.
- 15.4 The minimum fall is 1 in 30 for plywood roofs, 1 in 60 for concrete roofs, and 1 in 100 for gutters. The minimum fall for decks is 1 in 40. 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 BRANZ recommend a fall of 1 in 60 for gutters.]*
- 15.5 Allowance for deflection and settlement of the substrate must be made in the design of the roof to ensure falls are maintained and no ponding of water can occur.
- 15.6 The ARDEX Warm Roofing System 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.
- 15.7 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.
- 15.8 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by the blockage of roof drainage.
- 15.9 The design of details not covered by the Technical Literature is subject to specific weathertightness design and is outside the scope of this Appraisal.

Condensation Control

- 16.1 The vapour barrier must be installed over the substrate prior to installing the insulation.

Water Supplies

- 17.1 The Butynol® and Butyseal Roofing Membrane Systems [Appraisal No. 436] and ARDEX WeldTec Exposed Membrane Systems [Appraisal No. 1061] are appraised for the collection of drinking water.
- 17.2 The first 25 mm of rainfall from a newly installed Butynol® and Butyseal Roofing Membrane Systems or ARDEX WeldTec Exposed Membrane Systems roof must be discarded before drinking water collection starts. This is to remove residues which may have developed in the processes involved in the production of Butynol® and Butyseal Roofing Membrane Systems or ARDEX WeldTec Exposed Membrane Systems.
- 17.3 Note that all water collected off roof surfaces made from any material is considered to be non-potable due to possible contamination from other sources. Water collected in this way can only be considered potable if it has been passed through a suitable sterilisation system. Sterilisation systems have not been assessed and are outside the scope of this Appraisal.
- 17.4 Contact ARDEX New Zealand Limited for guidance regarding selection of a suitable membrane.

Installation Information

Installation Skill Level Requirement

- 18.1 Installation must always be carried out in accordance with the ARDEX Warm Roofing System Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant License Class.
- 18.2 Installation and finishing of components and accessories supplied by ARDEX New Zealand Limited and its approved applicators must be completed by trained installers, approved by ARDEX New Zealand Limited.
- 18.3 Installation of the accessories supplied by the building contractor must be carried out in accordance with the ARDEX Warm Roofing System Technical Literature and this Appraisal by, or under the supervision of a Licensed Building Practitioner [LBP] with the relevant Licence Class.

Preparation of Substrates

- 19.1 Substrates must be dry, clean, and stable before installation commences.
- 19.2 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.
- 19.3 The moisture content of the plywood and timber substructure must be a maximum of 20% and the plywood sheets must be dry at time of membrane application.

System Installation

- 20.1 The ARDEX Warm Roofing System must be installed in accordance with the Technical Literature.
- 20.2 The vapour layer is installed onto the substrate followed by the insulation. The insulation is set out in a brick bond fashion and is screwed down using the screws and washers as defined in the Technical Specification.
- 20.3 Where the ARDEX Warm Roofing System is installed as deck insulation the system must be protected in accordance with the instruction of ARDEX New Zealand Limited.
- 20.4 The membranes are installed in accordance with ARDEX New Zealand Limited technical information.

Inspections

- 21.1 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 system.
 - Acceptance of the substrate by the system installer prior to application of the system.
 - Installation of the system to the Technical Literature.

Health and Safety

- 22.1 Safe use and handling procedures for the ARDEX Warm Roofing System is provided in the Technical Literature. The products must be used in conjunction with the relevant Material Safety Data Sheets for each product.

Basis of Appraisal

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

Tests

- 23.1 The following is a summary of the testing and test reports on the ARDEX Warm Roofing System:
- Testing has been carried out on the membranes for elongation, tensile strength, seam strength, breaking strength, low temperature, resistance to aging, water absorption, resistance to UV and peel adhesion.
 - Dimensions, density, thermal conductivity, compressive strength, tensile strength, fire behaviour (Class E), water absorption, specific heat capacity, water vapour diffusion resistance and linear expansion coefficient.
 - The ARDEX Polyiso Insulation board [foamed plastic] used in the ARDEX Warm Roofing System has been tested and complies with the flame propagation criteria of AS 1366 as required by NZBC Acceptable Solution C/AS1, Paragraph 4.2.2.1 and NZBC Acceptable Solution C/AS2, Paragraph 4.17.2.

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

Other Appraised Components

- 24.1 The following components of the Ardex Warm Roofing System has been appraised by BRANZ, and Basis of Appraisal information for each can be found in the relevant Appraisal:
- Butynol® and Butyseal Roofing Membrane Systems - Appraisal 436; and,
 - ARDEX Torch Applied Membranes - Appraisal 463; and,
 - Elevate UltraPly™ TPO 1.5 mm and Elevate UltraPly™ TPO 1.14 mm Membranes - Appraisal 728; and,
 - ARDEX WeldTec Exposed Membrane Systems - Appraisal 1061; and,
 - Shelterseal Damp-Proof Membranes - Appraisal 462.

Other Investigations

- 25.1 A durability opinion has been provided by BRANZ technical experts.
- 25.2 Installation of the insulation and membranes has been assessed by BRANZ for practicability of installation and found to be satisfactory.
- 25.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 26.1 The manufacture of the components of the system 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.
- 26.2 The quality of the supply of products to the market is the responsibility of ARDEX New Zealand Limited.
- 26.3 Quality on-site is the responsibility of the ARDEX New Zealand Limited trained and approved installers.
- 26.4 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 ARDEX New Zealand Limited and this Appraisal.
- 26.5 Building owners are responsible for the maintenance of the membrane system in accordance with the instructions of ARDEX New Zealand Limited and this Appraisal.



Sources of Information

- AS 1366:1992 Rigid cellular plastics sheets for thermal insulation.
- AS/NZS 1170:2002 Structural design actions - General principles.
- AS/NZS 2269:2012 Plywood - Structural.
- BRANZ Bulletin No. 585 Measuring moisture in timber and concrete.
- BRANZ Good Practice Guide: Membrane Roofing [Second Edition], October 2015.
- ISO 9705:1993 Fire tests - Full scale room test for surface products.
- NZS 3101:2006 The design of concrete structures.
- NZS 3604:2011 Timber-framed buildings.
- NZS 4214:2006 Methods of determining the total thermal resistance of parts of 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, the **ARDEX Warm Roofing System** 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 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



Claire Falck

Chief Executive

Date of Issue:

25 September 2024