



BRANZ Appraised
Appraisal No. 854 [2014]

ARDEX WPM 615 TPO ROOFING MEMBRANE

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The roof of the RACV Building Royal Pines Resort, Queensland.

BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Ardex Australia Pty Ltd

20 Powers Road
Seven Hills
NSW

Tel: 1300 788 780

Fax: 1300 780 102

Web: www.ardexaustralia.com



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 Ardex WPM 615 TPO Roofing Membrane is a single ply, polyester weft reinforced, thermoplastic polyolefin [TPO] waterproofing sheet membrane for building roofs.

Scope

- 2.1 Ardex WPM 615 TPO Roofing Membrane has been appraised as a roof waterproofing membrane on buildings within the following scope:

- with building structures designed and constructed to meet the requirements of the BCA; and,
- with roof supporting structures of timber framing with substrates of plywood; and,
- with substrates of suspended concrete slabs and steel decking; 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. Refer to the Appraisal Holder.

- 2.2 Roofs waterproofed with Ardex WPM 615 TPO Roofing Membrane must be designed and constructed in accordance with the following limitations:

- nominally flat, curved or pitched roofs constructed to drain water to gutters and drainage outlets complying with the BCA; and,
- constructed to suitable falls [Refer Paragraphs 14.4 – 14.6].

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

- 2.4 The membrane must be installed by Ardex Australia Pty Ltd approved applicators.

Building Regulations

National Construction Code (NCC 2013) Building Code of Australia (BCA)

3.1 In the opinion of BRANZ, the Ardex WPM 615 TPO Roofing Membrane, if designed, used, installed and maintained in accordance with the statements and conditions of this Appraisal, will meet the following provisions of the BCA:

BCA Volume 1 – Class 2 to 9 Buildings

Section F1 – Damp and waterproofing. Performance FP 1.4. See Paragraphs 14.1 – 14.3.

BCA Volume 2 – Class 1 and 10 Buildings

Section 2 – Damp and weatherproofing. Performance P2.2.2. See Paragraphs 14.1 – 14.3.

Technical Specification

4.1 Materials supplied by Ardex Australia Pty Ltd are as follows:

- **Ardex WPM 615 TPO Roofing Membrane** is a single ply roofing system based on a thermoplastic polyolefin [TPO] sheet, with non-halogenated flame retardants laminated around a polyester weft reinforcement. It is supplied in white in rolls 1.2 and 1.5 mm thick, 2.0 m wide and 30.5 m long.
- **Ardex WPM 623 – TPO Flashing** is a non reinforced TPO Membrane designed to be used in situations where a pre-moulded accessory is not available. It is supplied as a 0.61 m x 15.25 m roll in white.
- **Ardex TPO Inside/Outside Corners** are made from a flexible non reinforced TPO and are specifically designed for flashing inside or outside corners. They are supplied as a 76 mm x 76 mm x 82 mm corner with a 12.7 mm radius on all edges of the raised corner, in white.
- **Ardex TPO Universal and Large Pipe Flashing** are TPO membrane flashings, designed for flashing of round penetrations. The Universal is used for flashing round penetrations with an outside diameter of 25.4 mm to 152.4 mm; the Large is used for flashing round penetrations with an outside diameter of 101.6 mm to 203.2 mm. They are supplied in white.
- **Ardex TPO QuickSeam Flashing** is a non reinforced TPO Membrane laminated to a white cured seaming tape for flashing metal roof edging profiles and other details as indicated by Ardex Australia Pty Ltd. It is supplied as a 0.14 m x 30.5 m roll, in white.
- **Ardex WPM 642 – Water Based Bonding Adhesive** is a water based contact adhesive for bonding Ardex WPM 615 TPO Membrane to wood, metal and other acceptable substrates. It is supplied as a pink colour in 18.9 litre pails.
- **Ardex WPM 651 – TPO Cut Edge Sealant** is a polymer based sealant designed to seal cut edges of Ardex WPM 615 TPO Membrane where the scrim reinforcement is exposed. It is supplied in white in cartons of 4 bottles.
- **Ardex WPM 657 – TPO General Purpose Sealant** is a high quality sealant with excellent adhesion to a variety of surfaces, used as a termination bar caulk and cut edge/seam sealant. It is supplied in cartridges, coloured white.
- **Ardex WPM 659 – TPO Pourable Sealant** is a two component polyurethane sealer designed to seal around small pipe penetration, clusters of pipes, I beams etc. in a penetration pocket detail. It is supplied in 3.78 litre packs and is coloured black.
- **Ardex All Purpose Fasteners** are specifically designed for mechanical attachment of the Ardex TPO Membrane to steel, plywood and timber decks. They are supplied as 32 mm long screws, coloured red.
- **Ardex HD Seam Plate** are specifically designed to be used for the attachment of Ardex TPO Membrane to approved substrates using Ardex All Purpose Fasteners. They are supplied as 60.3 mm diameter plates.
- **Ardex Pressure Seal** is designed for termination of Ardex TPO Membrane against smooth walls in all roofing situation. They are supplied as 3.1 m x 35 mm x 2.2 mm thick bars.
- **Ardex Eco Walkway Pad** is a non-reinforced walkway composed of recycled TPO and EPDM. The pad has a slip resistance texture surface.

Handling and Storage

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

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Ardex WPM 615 TPO Roofing Membrane, Ardex TPO Roofing Systems. 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 Ardex WPM 615 TPO Roofing Membrane is for use on roofs where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 The effective control of internal moisture must be considered at the design stage due to the impermeability of the membrane. Refer to BRANZ publication "Good Practice Guide to Membrane Roofing".
- 7.3 Where regular foot traffic is envisaged, i.e. maintenance of lift equipment, Ardex Eco Walkway Pad or similar should be used. Ardex WPM 615 TPO Roofing Membrane is designed for limited, irregular pedestrian access only.

Structure

- 8.1 Ardex WPM 615 TPO Roofing Membrane fully bonded is suitable for use in areas subject to maximum wind pressure of 3 kPa Ultimate Limit State subject to the limitations of the substrate.

Substrates

Plywood

- 9.1 Structural plywood must be a minimum of 17 mm thick complying with AS/NZS 2269. The structural plywood must be supported with joists at maximum spacing as detailed in AS 1684.3, Table 5.3. Fixing shall be as the "Technical Note on the Use of EWPA Branded Structural Plywood as Exterior Decking".

Note: LOSP treated plywood must not be used.

Concrete

- 9.2 Concrete substrates must be designed in accordance with BCA 2013.

Steel

- 9.3 Metal decks require a minimum thickness of 0.75 mm for galvanized steel. The deck should be installed without inducing stresses (over-stretching/compressing) that could cause the flutes to bend. The deck should be fixed to the substrate using sufficient fasteners as the manufacturer's specifications.

Durability

Serviceable Life

- 10.1 Ardex WPM 615 TPO Roofing Membrane, when subjected to normal environmental conditions and properly maintained, can be expected to have a serviceable life of at least 15 years.

Maintenance

- 11.1 Maintenance requirements of the membrane are provided by the membrane supplier.
- 11.2 In the event of damage to the membrane, the membrane 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.

Outbreak of Fire

- 12.1 Ardex WPM 615 TPO Roofing Membrane must be protected or separated from fireplaces, heating appliances, chimneys and flues in accordance with the requirements of BCA Volume 1, Part GP 2.1 and Part G2 and BCA Volume 2, Part P 2.3.3 and Part 3.7.3.

Fire Hazard Properties

- 13.1 Ardex WPM 615 TPO Roofing Membrane has not been assessed for fire hazard properties and is therefore outside the scope of this Appraisal.

External Moisture

- 14.1 Roofs must be designed and constructed to meet code compliance with Part F1- Damp and waterproofing, Performance FP1.4 and Part 2.2 – Damp and weatherproofing, Performance P2.2.2. They must also take account of snowfalls in snow prone areas.
- 14.2 When installed in accordance with this Appraisal and the Technical Literature, Ardex WPM 615 TPO Roofing Membrane will prevent the penetration of water and will therefore meet code compliance with Part F1- Damp and waterproofing, Performance FP1.4 and Part 2.2 – Damp and weatherproofing, Performance P2.2.2. The membrane is impervious to water and will give a weathertight roof capable of accepting minor structural movements.
- 14.3 Ardex WPM 615 TPO Roofing Membrane is impermeable, therefore a means of dissipating construction moisture must be provided in the building design and construction to meet code compliance with Part F1- Damp and waterproofing, Performance FP1.4 and Part 2.2 – Damp and weatherproofing, Performance P2.2.2.
- 14.4 Roof falls must be built into the substrate and not created with mortar screeds applied over the membrane.
- 14.5 BRANZ recommends a minimum fall to roofs of 1 in 30 and all falls must slope to an outlet. Inadequate falls will allow moisture to collect and increase the risk of deterioration of the membrane.
- 14.6 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.
- 14.7 Drainage flanges must be used for either clamped or normal outlets 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 membrane must be raised above the level of any possible flooding caused by the blockage of roof drainage.
- 14.9 Details not covered by the Technical Literature are subject to specific weathertightness design and are outside the scope of this Appraisal.

Installation Information

Installation Skill Level Requirement

- 15.1 Installation of the membrane must be completed by approved applicators, approved by Ardex Australia Pty Ltd.
- 15.2 Installation of substrates must be completed by tradespersons with an understanding of roof construction, in accordance with instructions given within the Ardex Australia Pty Ltd Technical Literature and this Appraisal.

Preparation of Substrates

- 16.1 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.
- 16.2 Concrete substrates can be checked for dryness by methods outlined in AS 1884: 2012. The relative humidity of the concrete must be 75% or less before membrane application.
- 16.3 The moisture content of a timber substructure must be a maximum of 20% and plywood sheet must be dry at the 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

- 17.1 The installation of this membrane system is very complex and limited to trained applicators only. The Ardex Australia Pty Ltd Applicator's Manual should be referred to in all instances for the correct procedures.

Inspections

- 18.1 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

- 19.1 Safe use and handling procedures for the membrane system are provided in the Technical Literature. The product 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

- 20.1 Testing has been carried out on the membrane by various organisations for tensile strength, elongation, joint peel and shear strength, cold bending after UV aging, static load resistance, water pressure resistance, water vapour permeability, shear/joint strength, adhesion to plywood, peel adhesion, resistance to aging, resistance to impact, resistance to frost, resistance to freeze/thaw, elongation, seam strength, breaking strength, low temperature brittleness point, water absorption and resistance to UV. Results and test methods have been reviewed by BRANZ and found to be satisfactory.

Other Investigations

- 21.1 A durability opinion has been given on Ardex WPM 615 TPO Roofing Membrane by BRANZ technical experts.
- 21.2 Site visits have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 21.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

Quality

- 22.1 The manufacture of the Ardex WPM 615 TPO Roofing 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.
- 22.2 The quality of supply of the product to the market is the responsibility of Ardex Australia Pty Ltd.
- 22.3 Quality on site is the responsibility of the Ardex Australia Pty Ltd approved applicators.
- 22.4 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, Ardex Australia Pty Ltd and this Appraisal.

Sources of Information

- AS 1884: 2012 Floor coverings - Resilient sheet and tiles - Installation practices.
- AS/NZS 2269: 2008 Plywood - Structural.
- BRANZ Good Practice Guide - Membrane Roofing, October 2003.
- National Construction Code Series, Building Code of Australia 2013 - Australian Building Codes Board.
- Technical note on the Use of EWPAA Branded Structural Plywood As Exterior Decking - PAA Engineered Wood Products Association of Australasia.





In the opinion of BRANZ, **Ardex WPM 615 TPO Roofing 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 **Ardex Australia Pty 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. **Ardex Australia Pty 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 **Ardex Australia Pty 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 **Ardex Australia Pty Ltd** or any third party.

For BRANZ



Chelydra Percy

Chief Executive

03 February 2014