



BRANZ Appraised

Appraisal No.880 [2015]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 880 (2015)**

**ALLCO WARM ROOF
SYSTEM**

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BRANZ

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Product

1.1 The Allco Warm Roof System is an insulating roofing system for limited access flat roofs with concrete, plywood or steel structural decks. It consists of a thermal insulation layer and a roof finish of modified bitumen waterproofing sheet membrane.



Scope

2.1 The Allco Warm Roof System has been appraised for use as an insulating roof 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, plywood or steel structural decks subject to specific structural design; and,
- with roofs constructed to drain water to gutters and drainage outlets complying with the NZBC; and,
- with roofs constructed to suitable falls (Refer Paragraph 15.3 and 15.4); and,
- with no integral roof gardens; and,
- situated in NZS 3604 Building Wind Zones, up to, and including 'Extra High'.

2.2 The Allco Warm Roof System has also been appraised as an insulated roofing 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 the Allco Warm Roof System into their design in accordance with the declared properties and instructions of Allco Waterproofing Solutions Ltd.

2.3 The Allco Warm Roof System must be installed by Allco Waterproofing Solutions Ltd Licensed and Trained installers.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Allco Warm Roof 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. Allco Warm Roof System meets this requirement. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Allco Warm Roof System meets these requirements. See Paragraphs 15.1 - 15.9.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Allco Warm Roof System meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a). Allco Warm Roof System will contribute to meeting this requirement. See Paragraph 14.1.

3.2 This is an Appraisal of an **Alternative Solution** in terms of New Zealand Building Code compliance.

Technical Specification

4.1 Allco Warm Roof System is an insulating roofing for flat roofs. The thermal layer is a PIR board, available in a number of thicknesses to suit design requirements. The insulation board is mechanically fixed on limited access flats roofs of concrete, timber and steel structural decks. The roof finish is a modified bitumen waterproofing sheet membrane which is torch applied to the insulation board.

4.2 Materials supplied by Allco Waterproofing Solutions Ltd are as follows:

CASALI DERMABIT EXTRA 43170 ARDESIATO (SLATED)

- 4 mm thick, APAO modified bitumen, torch-on waterproofing membrane used as a cap sheet in a double layer roofing system. The lower face has a polyethylene film which is torched off during application; the upper face is finished with natural or slate coloured mineral chip.

CASALI DERMABIT EXTRA 4170

- 4 mm thick, APAO modified bitumen torch-on waterproofing membrane, used as a base membrane in a double layer roofing system. The lower face has a polyethylene film which is torched off during application; the upper face is finished with a sanded finish.

KINGSPAN TR24 PIR INSULATION

- Rigid thermoset insulation (PIR) for warm flat roofs waterproofed with torch applied multi-layer bituminous roofing. Supplied in various thickness and R-values with a board size of 1.2 m x 0.6 m.

CASALI VAPOREX

- 2 mm thick modified bitumen, torch on, vapour control waterproofing membrane with an aluminium sheet laminated within and is used as a sheet membrane to prevent the formation of condensation. Vaporex is lightly heated to bond to the Casali Gruver and the substrate.

CASALI GRUVER

- 2 mm thick polypropylene polymer modified bitumen compound, loose laid, used as a ventilation control layer with 4 cm diameter holes. The lower face has a polyethylene film which is torched off during application and the upper finish is sand; leaving a partial bond to the substrate.

FASTENERS - WASHER

- Fastenings are ISO-TAK BS-S for steel, ISO-FAST IW-S for plywood and ISO-FAST LBS-S-T25 for concrete. All are used with the RP45 washer.

Handling and Storage

5.1 Handling and storage of all materials whether on or off site is under the control of the Allco Waterproofing Solutions 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.

Design Information

General

7.1 Allco Warm Roof System is a roof system which provides thermal insulation and waterproofing. It is for use on limited access flat roofs subject only to light foot traffic for maintenance purposes. The insulation board is mechanically fixed to concrete, timber or metal structural decks which are subject to specific structural design. The insulation board is available in several thicknesses to suit various thermal insulation designs.

7.2 The system can be used on new or existing roofs subject to the suitability of the structural deck of existing roofs. The waterproofing membrane is a fully bonded double layer, torched applied, modified bitumen waterproofing sheet membrane with torch welded joints.

7.3 A vapour control membrane must be used in Climate Zone 3 (as defined in NZBC Verification Method H1/VM1 and NZBC Acceptable Solution H1/AS1). The vapour control membrane, CASALI VAPOREX, is a torch applied vapour barrier and applied over the structural deck before the installation of the insulation board.

7.4 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 - Membrane Roofing".

Structure

8.1 The insulation boards are mechanically fixed to all structural decks as per Table 1.

Table 1: Insulation fixings (1200 x 600 mm boards)

Wind Zone	Fixing per board
Low, Medium and High	4
Very High	5
Extra High	6

Note: Fixings must be evenly spaced and a minimum 50 mm and maximum of 150 mm from board edges.

8.2 For building subject to specific design, the structural design must confirm that the fixings has adequate holding into the structural deck.

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 comply with AS/NZS 2269, at least CD Grade Structural.

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 minimum 0.55 mm BMT steel to AS 1397.

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 Allco Warm Roof 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 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 system, must be regularly (at least annually) checked for damage, rubbish and debris. Damage, such as small punctures and tears must be repaired as recommended by Allco Waterproofing Solutions Ltd.

11.2 Special care must be taken when inspecting the membrane roof 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.

Prevention of Fire Occurring

12.1 Separation or protection must be provided to Allco Warm Roof System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Control of Internal Fire and Smoke Spread

13.1 The Allco Warm Roof System meets the flame propagation criteria of AS 1366 as specified in NZBC Acceptable Solutions C/AS1 Paragraph 4.3 and NZBC Acceptable Solutions C/AS2 to C/AS6 Paragraph 4.17.

13.2 The Allco Warm System also meets the requirements of C/VM2, Section A1.7 except for when a steel substrate is used. If a steel substrate is used then there must be a surface lining material used with the system that meets the requirements of C/VM2, Section A1.7 (a), (b) and (c).

Energy Efficiency

14.1 The thermal resistance (R-value) of building elements may be verified by using NZS 4214. The R-values for the KINGSPAN TR24 PIR INSULATION are given in Table 2.

Table 2

KINGSPAN TR24 PIR INSULATION - Thickness	R-value
25	0.94
30	1.13
40	1.51
50	1.89
60	2.26
80	3.13
100	3.92
120	4.90
140	5.71
150	6.12

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 by 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 Allco Warm Roof System will prevent the penetration of water and will therefore meet code compliance with Clause E2.3.2. The membrane is impervious to water and will give a weathertight roof.

15.3 Roof falls must be built into the substrate.

15.4 The minimum fall to roofs is 1 in 30 and gutters 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.

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 Allco Warm Roof System is 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.

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 In Climate Zone 3 as defined in NZBC H1/VM1 and H1/AS1 - Definitions, a vapour control membrane, CASALI VAPOREX, must be installed over the substrate prior to installing the insulation.

Water Supplies

17.1 Allco Warm Roof System will not contaminate water.

17.2 The first 25 mm of rainfall from a newly installed Allco Warm Roof System must be discarded before drinking water collection starts. This is to remove residues which any have developed in the processes involved in the production of the Allco Warm Roofing System.

17.3 Though Allco Warm Roof System will not contaminate water, it must be noted 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 collection in this way can only be considered potable if it has been passed through a suitable sterilization system. Sterilization systems such as this have not been assessed and are outside the scope of this Appraisals.

Installation Information

Installation Skill Level Requirement

18.1 Installation of the Allco Warm Roof System must be completed by Allco Waterproofing Solutions Ltd Licensed and Trained Installers.

18.2 Installation of structural decks must be completed by tradespersons with an understanding of roof construction, in accordance with instructions given within the Allco Waterproofing Solutions Ltd Technical Literature and this Appraisal.

Preparation of Substrates

19.1 Structural decks 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. 515.

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 the time of membrane application.

System Installation

20.1 The Allco Warm Roof System must be installed in accordance with the Technical Literature.

20.2 Where the vapour control layer is required it is installed onto the structural deck followed by the insulation. The installation is set out in a brick bond fashion and mechanically fastened as defined in the Technical Specification.

20.3 The membrane system is then installed over the insulation; generally the membrane must be unrolled without tension onto the prepared substrate and allowed to 'relax' for at least 30 minutes prior to installation.

20.4 The membrane is then 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.

Inspections

21.1 Critical areas of inspection for waterproofing systems are:

- Construction of structural decks, including installation of bond breakers and movement control joints.
- Moisture content of the structural deck prior to the application of the system.

- Acceptance of the structural deck 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 Allco Warm Roof System is 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

23.1 Testing and test reports on the components of Allco Warm Roof System have been reviewed as part of the assessment by BRANZ and this review has found them to be satisfactory.

Other Investigations

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

24.2 Installation of the insulation and membranes have been assessed by BRANZ for practicability of installation and found to be satisfactory.

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

Quality

25.1 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.

25.2 The quality of the supply of products to the New Zealand market is the responsibility of Allco Waterproofing Solutions Ltd.

25.3 Quality on site is the responsibility of the Allco Waterproofing Solutions Ltd Trained and Approved Installers.

25.4 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 Allco Waterproofing Solutions Ltd and this Appraisal.

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

Sources of Information

- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 6, 14 February).
- AS/NZS 1170: 2002 Structural design actions - General principles.
- AS/NZS 2269: 2008 Plywood - Structural.
- BRANZ Good Practice Guide - Membrane Roofing, reprint October 2003.
- NZS 3101: 1995 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 for Compliance Documents and Handbooks.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992.



BRANZ

In the opinion of BRANZ, [Allco Warm Roof 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 [Allco Waterproofing Solutions 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. [Allco Waterproofing Solutions 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 [Allco Waterproofing Systems 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 [Allco Waterproofing Systems Ltd](#) or any third party.

For BRANZ

C Percy
Chief Executive

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