



BRANZ Appraised
Appraisal No. 1169 [2021]

EQUUS SOPREMA WARM ROOF SYSTEM

Appraisal No. 1169 [2021]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Equus Soprema Warm Roof System is an insulating roofing system for limited access flat roofs and decks with concrete, timber or steel structural decks. It consists of a thermal insulation layer and a roof finish of modified bitumen waterproofing membrane or single-ply TPO waterproofing membrane.

Scope

- 2.1 Equus Soprema Warm Roof 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 substrates and incorporation of the Equus Soprema Warm Roof System 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 14.3 and 14.4]; and,
 - with no integral roof gardens and no downpipe direct discharge; and,
 - situated in NZS 3604 Wind Zones, up to, and including Extra High.
- 2.2 Equus Soprema Warm Roof System has also been appraised for durability and thermal performance 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 Equus Soprema Warm Roof System into their design in accordance with the declared properties and instructions of Equus Industries Ltd.
- 2.3 Equus Soprema Warm Roof System must be installed by Equus Industries Ltd approved and trained installers.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Equus Soprema 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. Equus Soprema Warm Roof System meets this requirement. See Paragraphs 10.1 and 10.2.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Equus Soprema Warm Roof System meets these requirements. See Paragraphs 14.1–14.5.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Equus Soprema Warm Roof System meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a]. Equus Soprema Warm Roof System contributes to meeting this requirement. See Paragraph 13.1.

Technical Specification

4.1 Equus Soprema Warm Roof System is an insulating roofing system for flat roofs and decks. The thermal layer is a polyisocyanurate board or mineral wool insulation board available in a number of thicknesses to suit design requirements. The insulation board is mechanically or adhesive fixed on limited access flat roofs and decks of concrete, timber and steel structural decks. The roof finish is a modified bitumen waterproofing membrane or single-ply TPO membrane, which is adhered to the insulation or roof cover board as per manufacturer installation guidelines.

Materials supplied by Equus Industries Ltd are as follows:

- Equus Soprema Duo High Tech Waterproofing Membrane System
- Equus Soprema Flagon TPO Waterproofing Membranes
- Equus Novaglass Waterproofing Membranes
- Equus Soprema Deboflex 2.5 mm T/F C175
- Thermal Insulation : Soprema Efyos Blue A/Recticel Eurothane silver/ Soprarock Mineral Wool
- Equus Guardian Fastener Range - fixings as below
 - Wood - BSRF 4.8 s/s
 - Metal - BS 6.1
 - Concrete - CS 6.1
 - Tubes R75 and ASTL
 - Plates SP-70 and SP- 8240
- Equus Soprema Easyfoam PU Adhesive - used to adhere EFYOS and Eurothane Silver to vapour barrier.

Handling and Storage

5.1 Handling and storage of all materials whether on-site or off-site is under the control of the Equus Industries Ltd approved 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 Equus Soprema Warm Roof System. 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 The Equus Soprema Warm Roof System is a roof and deck 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 or adhered with PU adhesive 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.
- 7.3 The waterproofing membranes are fully bonded, partially bonded, adhesive or mechanically fastened Soprema Waterproofing system with a valid BRANZ Appraisal which are two-layer modified bitumen sheet or TPO single-ply with heat welded joints.
- 7.4 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 is a 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 BRANZ publication Good Practice Guide: Membrane Roofing.

Structure

- 8.1 In all cases, the fastening requirements are specified by Equus Industries Ltd to resist wind forces as determined by AS/NZS 1170. This calculation is specific to each project.
- 8.2 For buildings subject to specific design, the structural designer must confirm that the fixing has adequate holding into the structural decking.

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 Equus Soprema 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 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, 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 Equus Industries Ltd.
- 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 Equus Soproema Warm Roof System from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solutions C/AS1, and Acceptable Solutions C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Fire affecting areas beyond the fire source

Control of Internal Fire and Smoke Spread

- 12.2 The Equus Soproema Warm Roof System includes Soproema Efyos Blue A or Recticel Eurothane silver (combustible insulants) and therefore requires a suitable interior surface finish for the completed system to achieve the required Group Number as specified in C/AS2 Table 4.3 and the combustible insulant shall comply with the flame propagation criteria as specified in AS1366 Parts 1-4 for the material being used.
- 12.3 The Soproema Efyos Blue A or Recticel Eurothane silver used in the Equus Soproema Warm Roof System has been tested and complies with the flame propagation criteria of AS 1366 as required by NZBC Acceptable Solution C/AS1 Section 4.3 and C/AS2 Paragraph 4.17.2.
- 12.4 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 meeting the requirements of C/AS2 Table 4.3.

Energy Efficiency

- 13.1 Thermal resistance (R-Value) of building elements may be verified by using NZS 4214. The R-Values for the Insulation are given in Table1.

Table 1: R-values

Thickness	R-Value
Efyos/Eurothane Silver 40 mm	1.7
Efyos/Eurothane Silver 60 mm	2.5
Efyos/Eurothane Silver 80 mm	3.35
Efyos/Eurothane Silver 100 mm	4.2
Efyos/Eurothane Silver 120 mm	5.05
Efyos/Eurothane Silver 140 mm	5.9
Efyos/Eurothane Silver 160 mm	6.75
SopraRock 60 mm	1.64
SopraRock 80 mm	2.17
SopraRock 100 mm	2.75
SopraRock 120 mm	3.34
SopraRock 140 mm	3.89

External Moisture

- 14.1 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.
- 14.2 When installed in accordance with this Appraisal and the Technical Literature, Equus Soprema Warm Roof 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.
- 14.3 Roof falls must be built into the substrate or formed using tapered insulation board.
- 14.4 The minimum fall to roofs is 1 in 30 for plywood and steel, 1 in 60 for concrete and 1 in 100 for gutters. The minimum fall for decks is 1 in 40 [Note: Where possible BRANZ recommends a fall of 1 in 60 in gutters].
- 14.5 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.
- 14.6 Equus Soprema 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 NZBC 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 membrane must be raised above the level of any possible flooding caused by the blockage of roof 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.

Condensation Control

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

Water Supplies

- 16.1 Water is not contaminated by Equus Duo High Tech Waterproofing Membrane System or Equus Novaglass Waterproofing Membranes.
- 16.2 The first 25 mm of rainfall from a newly installed must be discarded before water collection starts. This is to remove residues which may have developed in the process involved in the production of the Soprema warm roof system.
- 16.3 Though it 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 and tested. Sterilization systems such as this have not been assessed and are outside the scope of this Appraisal.
- 16.4 Equus Soprema Flagon TPO Waterproofing Membranes have not been assessed for roofs used for the collection of potable water.

Installation Information

Installation Skill Level Requirement

- 17.1 Installation must always be carried out in accordance with Equus Soprema Warm Roof System Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner (LBP) with the relevant Licence Class.
- 17.2 Installation and finishing of components and accessories supplied by Equus Industries Ltd and its approved and trained installers must be completed by approved and trained installers, approved by Equus Industries Ltd.



- 17.3 Installation of the accessories supplied by the building contractor must be carried out in accordance with Equus Soprema Warm Roof 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

- 18.1 Substrates must be dry, clean and stable before installation commences.
- 18.2 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.
- 18.3 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

- 19.1 Equus Soprema Warm Roof System must be installed in accordance with the Technical Literature.
- 19.2 Where a vapour layer is required, it is installed onto the substrate followed by the insulation. The insulation is set out in a brick bond fashion and is adhered with PU adhesive or screwed down using the screws and washers as defined in the Technical Specification.
- 19.2 The membranes are then installed as per the Technical Literature.

Inspections

- 20.1 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

- 21.1 Safe use and handling procedures for Equus Soprema Warm Roof System 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

- 22.1 The following is a summary of the testing and test reports on Equus Soprema Warm Roof System:
- 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. The manufacturer of Soprema DuO Roof and Deck Membrane Systems has been assessed and registered as meeting the requirements of ISO 9001 and ISO 14001.
 - 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 ultraviolet (UV) and peel adhesion to plywood and concrete.
 - 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 above test methods and results have been reviewed by BRANZ and found to be satisfactory.



Other Investigations

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

Quality

- 24.1 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.
- 24.2 The quality of the supply of products to the New Zealand market is the responsibility of Equus Industries Ltd.
- 24.3 Quality on-site is the responsibility of the Equus Industries Ltd approved and trained installers.
- 24.4 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 Equus Industries Ltd and this Appraisal.
- 24.5 Building owners are responsible for the maintenance of the membrane system in accordance with the instructions of Equus Industries Ltd and this Appraisal.

Sources of Information

- AS/NZS 1170:2002 Structural design actions - General principles.
- AS 1366: 1992 Rigid cellular plastics sheets for thermal insulation
- 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.
- 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.



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21 December 2021

EQUUS SOPREMA WARM ROOF
SYSTEM



In the opinion of BRANZ, **Equus Soprema 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 **Equus Industries 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. **Equus Industries 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 **Equus Industries 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 **Equus Industries Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

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21 December 2021