



BRANZ Appraised
Appraisal No. 1157 [2021]

SOPREMA FLAG FLAGON TPO WATERPROOFING SYSTEMS

Appraisal No. 1157 [2021]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



Equus Industries Ltd

PO Box 601

Blenheim

Tel: 03 578 0214

Web: www.equus.co.nz

Manufactured by:



SOPREMA SRL

Via Industriale dell'Isola 3

24040 Chignolo d'Isola [Bg]

Italy

Tel [NZ]: +64 21 800 407



BRANZ

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 Soprema Flag Flagon TPO Waterproofing Systems are thermoplastic polyolefin (TPO) roof and deck membranes. They can be fully glue-bonded or mechanically fastened, and left as an exposed membrane or be finished using ballast.

Scope

- 2.1 Soprema Flag Flagon TPO Waterproofing Systems have been appraised as roof and deck waterproofing membranes on buildings within the following scope:
- the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with respect to building height and maximum floor plan areas; and,
 - with building structures designed and constructed to meet the requirements of the NZBC; and,
 - with roof supporting structures of timber framing with substrates of plywood sheet; and,
 - with substrates of suspended concrete slabs; and,
 - with minimum falls for roofs of 1:30 and decks of 1:40; and,
 - with deck size limited to 40m², and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Soprema Flag Flagon TPO Waterproofing Systems have also been appraised for use as roof and deck waterproofing membranes on specifically designed buildings within the following scope:
- with building structures designed and constructed to comply with the NZBC; and,
 - with roof supporting structures of timber framing with substrates of plywood sheet; and,
 - with substrates of suspended concrete slab; and,
 - subjected to maximum wind pressures; 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].
- 2.3 Roofs waterproofed with Soprema Flag Flagon TPO Waterproofing Systems must be designed and constructed in accordance with the following limitations:
- nominally flat and pitched roofs and decks 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,
 - constructed to suitable falls; 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 membranes must be installed by Equus Industries Ltd approved applicators.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Soprema Flag Flagon TPO Waterproofing Systems, 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 and B2.3.2. Soprema Flag Flagon TPO Waterproofing Systems meet these requirements. See Paragraph 10.1.

Clause E2 EXTERNAL MOISTURE: Performance E2.3.1 and E2.3.2. Soprema Flag Flagon TPO Waterproofing Systems meet these requirements. See Paragraphs 13.1–13.8.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Soprema Flag Flagon TPO Waterproofing Systems meet this requirement.

Technical Specification

- 4.1 Materials supplied by Equus Industries Ltd are as follows:
- **Flagon EP/PR** – a TPO modified polyolefin membrane used as an exposed membrane mechanically fastened. It is supplied in rolls 1.2, 1.5, 1.8 or 2 mm thick, either 1.05 m or 2.1 m wide and 20 or 25 m long.
 - **Flagon EP/PR-F** – a TPO modified polyolefin membrane used as an exposed membrane mechanically fastened or a mixture of mechanical and glued. It is supplied in rolls 1.2, 1.5, 1.8 or 2 mm thick, 2.1 m wide and 20 or 25 m long.
 - **Flagon EP/PV** – a TPO modified polyolefin membrane used as a ballasted membrane mechanically fastened. It is supplied in rolls 1.2, 1.5, 1.8 or 2 mm thick, 2.1 m wide and 20 or 25m long.
 - **Flagon EP/PV-F** – a TPO modified polyolefin membrane used as a ballasted membrane and fully adhered. It is supplied in rolls 1.2, 1.5, 1.8 or 2 mm thick, 2.1 m wide and 20 or 25m long.
 - **Flagon EP/S** – a TPO modified polyolefin used for detailing work. It is supplied in rolls 1.5 mm thick, 1.05 m wide and 20 m long.
 - **Flagcol TF1** – a toluene-free, sprayable contact adhesive for adhering Flagon EP/PR-F and EP/PV-F. It is supplied in 5, 10 and 20 L tins and is coloured blue.
 - **Flexocol A89 Adhesive** – a polyurethane, moisture-curing adhesive for adhering Flagon EP/PR-F and EP/PV-F. It is supplied 12 kg tins.
 - **Equus Fixplus pedestals** – an adjustable pedestal protection system.
 - **Flagon TS** – a PVC-P membrane with geotextile backing used as protection layer on top of Flagon TPO waterproofing membranes.
- 4.2 Compatible accessories used with all the systems are:
- **Flagon internal/external TPO corners.**
 - **Flagon TPO pipe collars.**
 - **Flagon TPO Vapour Aerator.**
 - **Flagbar and Flagofil.**
 - **Flagmetal accessories.**
 - **Flagon TPO Walkways.**



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 applicator. 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 Soprema Flag Flagon TPO Waterproofing 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 Soprema Flag Flagon TPO Waterproofing Systems are for use on roofs, decks, gutters and parapets where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 Soprema Flag Flagon TPO Waterproofing Systems can be adversely affected by contact with bituminous substances. Equus Industries 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 Soprema Flag Flagon TPO Waterproofing Systems is designed for limited, irregular pedestrian access only.
- 7.5 Soprema Flag Flagon TPO Waterproofing Systems, when used on decks, require a pedestal protection system. Equus Industries Ltd should be contacted for the best system to meet design requirements.

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 Soprema Flag Flagon TPO Waterproofing Systems, fully bonded, are suitable for use in areas subject to maximum wind pressure of 6 kPa Ultimate Limit State [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.

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.



Durability

Serviceable Life

- 10.1 Soprema Flag Flagon TPO Waterproofing Systems, 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 membranes are provided by Equus Industries 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. This should be carried out by an Equus Industries Ltd approved applicator.
- 11.3 Drainage outlets must be maintained to operate effectively.

Prevention of Fire Occurring

- 12.1 Soprema Flag Flagon TPO Waterproofing Systems must be separated from fireplaces, heating appliances, flues and chimneys in accordance with the requirements of NZBC Acceptable Solutions C/AS1 and C/AS2, Paragraph 7.5.9 for the protection of combustible materials.

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, Soprema Flag Flagon TPO Waterproofing Systems will prevent the penetration of water and will therefore meet code compliance with NZBC Clause E2.3.2. The membranes are impervious to water and will give a weathertight roof or deck.
- 13.3 The minimum fall is 1 in 30 for plywood roofs, 1 in 60 for concrete roofs, and 1 in 100 for gutters. The minimum falls 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 1:60 for gutters].*
- 13.4 Soprema Flag Flagon TPO Waterproofing Systems are 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 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 Installation of the membranes must be completed by Equus Industries Ltd approved applicators.
- 14.2 Installation of substrates must be completed by, or under the supervision of, Licensed Building Practitioners with the relevant License Class, in accordance with instructions given within the Equus Industries Ltd Technical Literature and this Appraisal.



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 membranes are laid, to prevent rain wetting.

Membrane Installation

- 16.1 The installation of these membrane systems is very complex and limited to approved applicators only. The Equus Industries Ltd Technical Literature 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 systems is 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

- 19.1 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.
- 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 Soprema Flag Flagon TPO Waterproofing Systems 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 Soprema Flag Flagon TPO Waterproofing Systems 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 Equus Industries Ltd .
- 21.3 Quality on site is the responsibility of the Equus Industries 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, Equus Industries Ltd and this Appraisal.



Sources of Information

- AS/NZS 1170: 2002 Structural Design action – general principles.
- AS/NZS 2269: 2012 Plywood – Structural.
- 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 Appraised
Appraisal No. 1157 [2021]

BRANZ Appraisal
Appraisal No. 1157 [2021]
11 May 2021

SOPREMA FLAG FLAGON TPO
WATERPROOFING SYSTEMS



In the opinion of BRANZ, **Soprema Flag Flagon TPO Waterproofing Systems** are fit for purpose and will comply with the Building Code to the extent specified in this Appraisal provided they are 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

Date of Issue:

11 May 2021