



**BRANZ Appraised**  
Appraisal No. 1092 [2020]

## RUBBERFUSE SINTOFOIL TPO MEMBRANES

Appraisal No. 1092 [2020]



### BRANZ Appraisals

Technical Assessments of  
products for building and  
construction.



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## Product

- 1.1 Rubberfuse Sintofoil TPO Membranes are single-ply, polyester fabric reinforced, thermoplastic polyolefin [TPO/FTO] fully bonded waterproofing sheet membranes for roofs and decks.

## Scope

- 2.1 Rubberfuse Sintofoil TPO Membranes 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; or,
  - the scope of limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area when subject to specific structural design; and,
  - with substrates of plywood, or suspended concrete slab; and,
  - with minimum falls for roofs of 1:30 for plywood substrates, 1:60 for concrete substrates and decks of 1:40; and gutters 1:100,
  - with deck size limited to 40 m<sup>2</sup>; and,
  - situated in NZS 3604 Wind Zones, up to, and including Extra High.
- 2.2 Rubberfuse Sintofoil TPO Membranes have also been appraised as roof and deck waterproofing membranes on buildings within the following scope:
  - subject to specific structural and weathertightness design and,
  - with substrates of plywood, or suspended concrete slab; and,
  - situated in specific design wind pressures up to a maximum design differential ultimate limit state (ULS) of 6 kPa; and,
  - with the weathertightness design of junctions for each specific structure being the responsibility of the building designer.
- 2.3 Roofs and decks waterproofed with Rubberfuse Sintofoil TPO Membranes must be designed and constructed in accordance with the following limitations:
  - nominally flat roofs and decks and pitched roofs 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,
  - 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 Limited approved applicators.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Rubberfuse Sintofoil TPO Membranes, 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. Rubberfuse Sintofoil TPO Membranes meet this requirement. See Paragraph 9.1.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.1, E2.3.2 and E2.3.6. Roofs incorporating Rubberfuse Sintofoil TPO Membranes meet these requirements. See Paragraphs 12.1–12.8.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Rubberfuse Sintofoil TPO Membranes meet this requirement and will not present a health hazard to people.

## Technical Specification

4.1 Materials supplied by Equus Industries Limited are as follows:

- **Sintofoil ST Membrane** – is a TPO/FPA membrane used for new roofs as a fully adhered system. The membrane is supplied as a 1.2 mm or 1.5 mm thick, 1.5 m or 2.1 m wide sheet in roll lengths of 25 m or 30 m. The standard colours are black or grey, with white and lead grey available on special order.
- **Sintofoil FB Membrane** – is a TPO/FPA membrane with an synthetic polyester fleece underface, used for new and refurbishment roof projects as a fully adhered system. The membrane is supplied as a 1.2 mm or 1.5 mm thick, 2.1 m wide sheet in a roll length of 25 m. The standard colours are black or grey, with white and lead grey available on special order.
- **Sintofoil RG Membrane** – is a TPO/FPA membrane with a glass fibre mat reinforcement used for new roofs as a fully adhered system. The membrane is supplied as a 1.2 mm or 1.5 mm thick, 1.5 m or 2.1 m wide sheet in roll lengths of 25 m or 30 m. The standard colours are black or grey, with white and lead grey available on special order.
- **Flashing/Substrate Adhesive** – a synthetic rubber-based adhesive designed for bonding Sintofoil ST and Sintofoil RG membranes to concrete, masonry, wood and metal. It is supplied in 20 kg pails.
- **FB-SF Solvent Free Substrate Adhesive** – a solvent-free, moisture-curing polyurethane-based adhesive designed for bonding the Sintofoil FB membrane to all acceptable substrates. It is supplied in 20 kg pails.
- **Fuseprep Plus** – a cleaning agent used to clean Sintofoil TPO/FPA membranes when dirty or oxidised due to weathering. It is supplied in 1 L pails.
- **Rubberfuse SLM** – zinc steel sheet with Sintofoil ST membrane 1.2 mm laminated to one side and used for flashing details.
- **Rubberfuse Top Walkway** – a heavy-duty embossed TPO sheet for use over Sintofoil membranes as a non-slip walking surface.

## 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 Limited approved applicators. 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 Rubberfuse Sintofoil TPO Membranes. 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 Rubberfuse Sintofoil TPO Membranes are for use on roofs, decks, balconies, gutters and parapets where an impervious waterproof membrane is required to prevent damage to building elements and adjoining areas.
- 7.2 Rubberfuse Sintofoil TPO Membranes can be adversely affected by contact with bituminous substances. Equus Industries Limited 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 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 membranes are protected. The Rubberfuse Sintofoil TPO Membranes are designed for limited, irregular pedestrian access only.
- 7.5 Rubberfuse Sintofoil TPO Membranes when used on decks, require a pedestal protection. Equus Industries Limited should be contacted for the best system to meet design requirements.
- 7.6 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.
- 7.7 Rubberfuse Sintofoil TPO Membranes fully bonded are suitable for use in areas subject to maximum wind pressure of 6 kPa ULS, subject to the limitations of the substrate.

### Substrates

#### Plywood

- 8.1 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

- 8.2 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

- 9.1 Rubberfuse Sintofoil TPO Membranes, when subjected to normal conditions of environment and with proper maintenance, can expect to have a serviceable life of at least 15 years.

### Maintenance

- 10.1 Maintenance requirements of the membranes are provided by Equus Industries Limited.
- 10.2 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.
- 10.3 Drainage outlets must be maintained to operate effectively.

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Rubberfuse Sintofoil TPO Membranes from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and C/AS2, and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.



## External Moisture

- 12.1 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.
- 12.2 When installed in accordance with this Appraisal and the Technical Literature, Rubberfuse Sintofoil TPO Membranes 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.
- 12.3 The minimum fall for roofs is 1:30 for plywood substrates, 1:60 for concrete substrates, for decks 1:40 and for gutters 1:100. 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 recommends a fall of 1:60 for gutters].*
- 12.4 Rubberfuse Sintofoil TPO Membranes 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.
- 12.5 Roof and deck falls must be built into the plywood substrate.
- 12.6 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.
- 12.7 Penetrations and upstands of the membrane must be raised above the level of any possible flooding caused by blockage of roof drainage.
- 12.8 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

- 13.1 Installation of the membranes must be completed by Equus Industries Limited approved applicators.
- 13.2 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 Limited Technical Literature and this Appraisal.

### Preparation of Substrates

- 14.1 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.
- 14.2 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.
- 14.3 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

- 15.1 The installation of these membrane systems is very complex and limited to approved applicators only. The Equus Industries Limited Technical Literature should be referred to in all instances for the correct procedures.

## Inspections

- 16.1 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

- 17.1 Safe use and handling procedures for the membrane systems is provided in the Technical Literature. The products 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

- 18.1 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 UV and peel adhesion to plywood and concrete.
- 18.2 Test methods and results have been reviewed by BRANZ and found to be satisfactory.

### Other Investigations

- 19.1 A durability opinion has been given of the Rubberfuse Sintofoil TPO Membranes by BRANZ technical experts.
- 19.2 Site inspections have been carried out by BRANZ to assess the practicability of installation, and to examine completed installations.
- 19.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

- 20.1 The manufacture of the Rubberfuse Sintofoil TPO Membranes have 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.
- 20.2 The quality of supply of the product to the market is the responsibility of Equus Industries Limited.
- 20.3 Quality on site is the responsibility of the Equus Industries Limited approved applicators.
- 20.4 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 Limited and this Appraisal.

## Sources of Information

- AS/NZS 1170: 2002 Structural design actions – 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.



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17 December 2020

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In the opinion of BRANZ, **Rubberfuse Sintofoil TPO Membranes** 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 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. **Equus Industries 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 **Equus Industries 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 **Equus Industries Limited** or any third party.

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For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

17 December 2020