



BRANZ Appraised

Appraisal No. 1000 [2023]

THERMAKRAFT THERMABAR 397 LIGHT DIFFUSING REFLECTIVE UNDERLAY

Appraisal No. 1000 [2023]

This Appraisal replaces BRANZ
Appraisal No. 1000 [2018]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Thermakraft Thermabar 397 is a light-diffusing, reflective, synthetic roof and wall pliable building membrane for use in industrial and commercial buildings. The product is a laminate of three bonded layers, one surface is white in colour, where the other surface is metallised polyolefin. The white surface provides light diffusion and reflection when applied facing into the building. Thermakraft Thermabar 397 can also be used as a vapour control layer.

Scope

- 2.1 Thermakraft Thermabar 397 has been appraised for use as an exposed light-diffusing and reflective roof and wall pliable building membrane for buildings within the following scope:
 - industrial and commercial buildings subject to specific design; and,
 - with profiled metal roof and wall cladding; and,
 - situated in NZS 3604 Wind Zones up to, and including, Extra High.
- 2.2 Thermakraft Thermabar 397 has also been appraised for use as a vapour control layer in industrial and commercial buildings subject to specific design.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Thermakraft Thermabar 397, if used, designed, 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 and B2.3.2. Thermakraft Thermabar 397 meets these requirements. See Paragraphs 8.1 and 8.2.

Clause C3 FIRE AFFECTING AREAS BEYOND THE FIRE SOURCE: Performance C3.4 [c]. Thermakraft Thermabar 397 meets this requirement. See Paragraph 9.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Thermakraft Thermabar 397 meets this requirement.



Technical Specification

- 4.1 Thermakraft Thermabar 397 is a synthetic pliable building membrane for use under roof and wall claddings in industrial and commercial buildings. The product consists of a middle layer of spun bond polypropylene with bonded outer layers of white polypropylene and metallised polyolefin.
- 4.2 The product is supplied in rolls 1.35 m wide and a standard length of 55.6 m [75 m²]. The product can also be supplied in custom lengths. The rolls are wrapped in clear polythene film.

Accessories

- 4.3 Accessories used with Thermakraft Thermabar 397 which are supplied by the installer are:
 - **Fixings** - stainless steel staples, clouts, screws or proprietary underlay fixings.
 - **Roof underlay support** - minimum 0.9 mm diameter galvanised steel wire mesh in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 8.1.5.1, or safety mesh in accordance with AS/NZS 4389. [Note: The mesh must be galvanised in accordance with AS/NZS 4534.]
 - **Thermakraft white general purpose adhesive tape** - white polypropylene tape, using acrylic adhesive technology.

Handling and Storage

- 5.1 Handling and storage of the product, whether on-site or off-site, is under the control of the installer. The rolls must be protected from damage, direct sunlight and weather. They must be stored on end, under cover, in clean, dry conditions and must not be crushed.

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
 - Product Data Sheet Thermabar 397, Issue 7.0, September 2022.
 - Installation Guide Thermabar 397, Issue 3.0, September 2022.
- 6.2 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 Thermakraft Thermabar 397 is a synthetic pliable building membrane for use under roof and wall claddings. It is intended to be light-diffusing/reflective and provide light enhancement to interior spaces of industrial and commercial buildings. Thermakraft Thermabar 397 is also for use as a vapour control layer in ventilated industrial and commercial buildings. For design guidance on the use of foil underlays refer to the NZ Metal Roof and Wall Cladding Code of Practice.
- 7.2 Where Thermakraft Thermabar 397 is installed and subject to wind pressures, account of this must be taken in the design of the fixing method. The design must also minimise exposure to sunlight.
- 7.3 The suitability of Thermakraft Thermabar 397 for any local environment in industrial applications [e.g. where production activities could degrade the product] must be considered by the designer. Light reflectance ability will be dependent on avoiding contamination during construction, effects of processing and manufacturing in the space, dust deposits and maintenance.
- 7.4 Thermakraft Thermabar 397, when used in roofs, is self-supporting up to a maximum span of 1,200 mm. It can also be supported on mesh or safety netting as required by the building design.
- 7.5 Thermakraft Thermabar 397 is generally used in buildings where a means of secondary weather defence is not required. In these situations, it can be used under roofing at any roof pitch. Where it is used as part of the cladding system, the designer is responsible for the design using the product property performances.
- 7.6 Refer to the NZ Metal Roof and Wall Cladding Code of Practice for advice when used in contact with profiled metal roof cladding.
- 7.7 Refer to Table 1 for the material properties of Thermakraft Thermabar 397.



Table 1: Material properties of Thermakraft Thermabar 397

Underlay Properties	Property Performance Requirement	Results
Mechanical AS/NZS 4200.1	Edge tear and tensile strength	Edge tear [Average]: Machine direction > 275 N Cross direction > 155 N Tensile strength [Average]: Machine direction > 5.8 kN/m Cross direction > 3.3 kN/m
Electrical Conductivity AS/NZS 3100	Insulation resistance greater than 10 MΩ	Complies. Electrically Non-conductive

Durability

8.1 Thermakraft Thermabar 397 meets code compliance with NZBC Clause B2.3.1 (b) 15 years as a roof and wall pliable building membrane, depending on the design application.

Serviceable Life

8.2 Provided it is not exposed to the weather or ultraviolet (UV) light for a total of more than 7 days, is not exposed in-service to direct or reflected UV light, or wind damage and provided the cladding is maintained and remains weather resistant, Thermakraft Thermabar 397 is expected to have a serviceable life similar to foil underlays. Thermakraft recommends that the product be covered with the cladding within 24 hours of application.

Control of Internal Fire and Smoke Spread

9.1 Thermakraft Thermabar 397 has an AS 1530 Part 2 flammability index of not greater than 5 and therefore meets the requirements of NZBC Acceptable Solutions C/AS2, Paragraph 4.17.8 b), for the surface finish requirements of suspended flexible fabric used as an underlay to exterior cladding that is exposed to view in occupied spaces.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Thermakraft Thermabar 397 from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

11.1 Thermakraft Thermabar 397 must only be used under roof and wall claddings that meet the requirements of the NZBC Clause E2.

11.2 Thermakraft Thermabar 397 is intended for use in industrial and commercial buildings that are outside the scope of NZBC Acceptable Solution E2/AS1 and are subject to specific weathertightness design. These buildings generally do not require the use of an underlay for weathertightness compliance. Thermakraft Thermabar 397 can assist, when specifically designed, in the total cladding system's compliance with NZBC Clause E2.

Internal Moisture

12.1 Thermakraft Thermabar 397 is intended for use in industrial and commercial buildings that are subject to specific design. These buildings generally do not require the use of an underlay for internal moisture control. Thermakraft Thermabar 397 must only be used in buildings with adequate means of ventilation, moisture and condensation control. Buildings incorporating high moisture loads such as swimming pools, freezers, cool stores, open liquid containers and moisture generating plants, require specific design and are outside the scope of this Appraisal.



Installation Information

Installation Skill Level Requirement

- 13.1 Installation must always be carried out in accordance with the Thermakraft Thermabar 397 Technical Literature and this Appraisal by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

Underlay Installation

- 14.1 Thermakraft Thermabar 397 is installed with the white surface facing into the building interior space. The underlay must be fixed at maximum 300 mm centres to wall framing members or as specified by the designer where subject to wind. In roof installations, the underlay can be self-supporting up to a maximum span of 1,200 mm. It can also be laid over a roof underlay support of galvanised steel wire mesh or safety mesh. Safety mesh must be used in accordance with AS/NZS 4389. The underlay must be pulled taut before fixing.
- 14.2 Thermakraft Thermabar 397 may be installed vertically or horizontally. Laps must be a minimum of 150 mm wide. Where the designer intends the underlay to act as a means of secondary weather defence, the direction of the laps must ensure that any water collected is shed to the outer face. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 When fixing the product in windy conditions, care must be taken due to the large sail area.
- 14.4 When Thermakraft Thermabar 397 is used as a vapour control layer, all laps and junctions must be sealed with an adhesive tape.
- 14.5 Any areas damaged during installation must be replaced.

Inspections

- 14.6 The Technical Literature and NZ Metal Roof and Wall Cladding Code of Practice must be referred to during the inspection of Thermakraft Thermabar 397 installations.

Basis of Appraisal

The following is a summary of the technical investigations carried out:

Tests

- 15.1 The following tests have been carried out on Thermakraft Thermabar 397 in accordance with AS/NZS 4200.1: tensile strength, edge-tear resistance, and vapour resistance.
- 15.2 The flammability index of Thermakraft Thermabar 397 has been evaluated in accordance with AS 1530.2.
- 15.3 The electrical insulation resistance of Thermakraft Thermabar 397 to AS/NZS 3100 has been tested by Spectrum Laboratories.

Other Investigations

- 16.1 An opinion on the expected durability of the product has been given by BRANZ technical experts.
- 16.2 The practicability of installation of Thermakraft Thermabar 397 has been assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature has been examined by BRANZ and found to be satisfactory.



Quality

- 17.1 The manufacture of Thermakraft Thermabar 397 has been examined by BRANZ, including methods adopted for quality control. Details regarding the quality and composition of the materials used were obtained by BRANZ and found to be satisfactory.
- 17.2 The quality of supply to the market is the responsibility of Kingspan Insulation NZ Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the pliable building membrane into their design in accordance with the instructions of Kingspan Insulation NZ Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Kingspan Insulation NZ Limited.

Sources of Information

- AS 1530.2:1993 Test for flammability of materials.
- AS/NZS 3100:2017 Approval and test specification - General requirements for electrical equipment.
- AS/NZS 4200.1:2017 Pliable building membranes and underlays - materials.
- AS/NZS 4389:2015 Roof safety mesh.
- AS/NZS 4534:2006 Zinc and zinc/aluminium-alloy coatings on steel wire.
- NZ Metal Roof and Wall Cladding Code of Practice, Version 3.0.
- 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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19 May 2023

THERMAKRAFT THERMABAR 397
LIGHT DIFFUSING REFLECTIVE
UNDERLAY



BRANZ

In the opinion of BRANZ, **Thermakraft Thermabar 397 Light Diffusing Reflective Underlay** 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 **Kingspan Insulation NZ 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. **Kingspan Insulation NZ 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 **Kingspan Insulation NZ 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 **Kingspan Insulation NZ Limited** or any third party.

For BRANZ

Claire Falck
Acting Chief Executive

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19 May 2023