



**BRANZ Appraised**  
Appraisal No. 1230 [2022]

## THERMAKRAFT 213 BITUMINOUS ROOF AND WALL UNDERLAY

Appraisal No. 1230 [2022]



### BRANZ Appraisals

Technical Assessments of products for  
building and construction.



#### Kingspan Insulation NZ Limited

11 Turin Place  
Ōtara  
Auckland 2013  
New Zealand  
Tel: 09 273 3727

Email: [info@kingspaninsulation.co.nz](mailto:info@kingspaninsulation.co.nz)  
Web: [www.kingspaninsulation.co.nz](http://www.kingspaninsulation.co.nz)



#### BRANZ

1222 Moonshine Rd,  
RD1, Porirua 5381  
Private Bag 50 908  
Porirua 5240,  
New Zealand  
Tel: 04 237 1170  
[branz.co.nz](http://branz.co.nz)



## Product

- 1.1 Thermakraft 213 Bituminous Roof and Wall Underlay is a kraft paper-based bituminous building underlay for use under roofs and wall claddings.

## Scope

### Roof Underlay

- 2.1 Thermakraft 213 has been appraised as a non-self-supporting roof underlay on buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; and,
  - the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
  - with masonry tile roof cladding; or,
  - with metal tile or profiled metal roof cladding; and,
  - situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Extra High.

### Flexible Wall Underlay

- 2.2 Thermakraft 213 has also been appraised as a flexible wall underlay for buildings within the following scope:
  - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 for timber-framed buildings; and,
  - the scope limitations of NASH Building Envelope Solutions, Paragraph 1.1 for steel-framed buildings; and,
  - with direct fixed absorbent and non-absorbent wall claddings; or,
  - with absorbent or non-absorbent wall claddings installed over an 18 mm drained cavity; or,
  - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber-framed buildings or NASH Building Envelope Solutions for steel-framed buildings; and ,
  - situated in NZS 3604 and NASH Standard Part 2 Wind Zones up to, and including, Very High.

## Building Regulations

### New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Thermakraft 213 Bituminous Roof and Wall Underlay, 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 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Thermakraft 213 Bituminous Roof and Wall Underlay meets these requirements. See Paragraphs 9.1 and 9.2.

**Clause E2 EXTERNAL MOISTURE:** Performance E2.3.2. When used as part of the roof or wall cladding system, Thermakraft 213 Bituminous Roof and Wall Underlay will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Thermakraft 213 Bituminous Roof and Wall Underlay meets this requirement.

## Technical Specification

### General

- 4.1 Thermakraft 213 is a kraft paper coated on both sides with a bitumen layer and is coloured black on both the top and bottom faces.
- 4.2 Thermakraft 213 is supplied in rolls 1.37 m wide x 18.5 m, 36.5 m and 73 m long. The rolls are wrapped in paper.

### Accessories

- 4.3 Accessories used with Thermakraft 213 which are supplied by the installer are:
- **Fixings** - stainless steel staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the underlay to the framing.
  - **Roof underlay support (timber and steel frame)** - polypropylene strap, or minimum 0.9 mm diameter galvanised steel wire mesh where required to support the roof underlay in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions Paragraph 8.1.5.1. *[Note: The mesh must be galvanised in accordance with AS/NZS 4534.]*
  - **Wall underlay restraint (timber or steel frame)** - polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to restrain the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 or NASH Building Envelope Solutions, Paragraph 9.1.9.5.
  - **Thermal break sheathing (steel framing)** - in accordance with NASH Building Envelope Solutions, Paragraph 11.4.3.2.

## 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 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:
- Installation Guide, Thermakraft 213, Issue 2.0, dated September 2022.
  - Product Data Sheet, Thermakraft 213, Issue 5.0, dated 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 213 is a conventional kraft paper underlay for fixing to timber or steel-framed roofs and walls. The underlay is intended to limit entry of wind into roof and wall cavities. For roofs, the underlay assists in the moisture management of the roof cladding system and for walls it acts as a secondary barrier to wind-driven rain. Refer to Table 1 for material properties.

**Table 1: Material Properties**

NZBC E2/AS1 Table 23 Underlay Properties	Roof Property Performance Requirement	Wall Property Performance Requirement	Results
Absorbency	≥ 150 g/m <sup>2</sup>	≥ 100 g/m <sup>2</sup>	Pass*
Vapour Resistance	≤ 7 MN s/g	≤ 7 MN s/g	Pass
Water Resistance	≥ 100 mm	≥ 20 mm	Pass ≥ 100 mm
pH of Extract	≥ 5.5 and ≤ 8.0	≥ 5.5 and ≤ 8.0	Pass
Shrinkage	≤ 0.5%	≤ 0.5%	Pass
Mechanical	Edge tear and tensile strength	Edge tear and tensile strength	Edge tear [Average]: Machine direction = 91 N Cross direction = 71 N Tensile strength [Average]: Machine direction = 9.4 kN/m Cross direction = 5.1 kN/m
Air Barrier	Not applicable	Air resistance ≥ 0.1 MN s/m <sup>3</sup>	Pass. Thermakraft 213 can be used as an air barrier

\* Evaluated for roofs by testing to section 8 of BRANZ Study Report SR 228 [2010]

- 7.2 The underlay provides a degree of temporary weather protection during early construction. However, due to the nature of the product, same-day coverage is recommended.
- 7.3 Thermakraft 213 must not be exposed to the weather or ultraviolet [UV] light for a total of more than 7 days before being covered by the cladding.

### Timber and Steel Framing

7.4 Timber and steel framing must be provided in accordance with the requirements of the NZBC and the cladding manufacturer.

### Use as a Roof Underlay

- 7.5 Thermakraft 213 is suitable for use as a roof underlay under roof claddings on buildings in accordance with NZBC Acceptable Solution E2/AS1 Table 23 for timber-framed buildings and NASH Building Envelope Solutions Table 23 for steel-framed buildings.
- 7.6 Thermakraft 213 is suitable for use in residential and commercial roofs with roof pitches of minimum 10° and must be fully supported with a corrosion resistant roof underlay support. Thermakraft 213 can be installed vertically and horizontally and must span no more than 300 mm in one direction. [Note: For roof pitches less than 10°, Kingspan Insulation NZ Limited recommends the use of Thermakraft Covertek 407. Refer to BRANZ Appraisal No. 651].

### Use as a Wall Underlay

- 7.7 Thermakraft 213 is suitable for use under wall claddings as a wall underlay, in accordance with NZBC Acceptable Solution E2/AS1, Table 23 on timber-framed buildings and NASH Building Envelope Solutions Table 23 on steel-framed buildings, including non-absorbent wall claddings such as vinyl and metal-based weatherboards in direct fixed situations.
- 7.8 Thermakraft 213 is suitable for use as an air barrier where walls are not lined, such as attic spaces at gable ends, in accordance with NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solution, Paragraph 9.1.4 [c].
- 7.9 In cavity installations where the cavity battens are installed at greater than 450 mm centres, Thermakraft 213 must be restrained between the battens to prevent the underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity. Refer to the NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5 for timber frame or NASH Building Envelope Solutions, Paragraph 9.1.9.5 for steel frame buildings. Wall underlay restraint options include polypropylene strap, galvanised mesh or galvanised wire, vertical cavity battens or thermal break sheathing [steel-frame only].

### Structure

- 8.1 Thermakraft 213 is suitable for use in all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Very High when used as a stand-alone flexible wall underlay, and all Wind Zones of NZS 3604 and NASH Standard Part 2 up to, and including, Extra High when used as an overlay for rigid wall underlays or as a roof underlay.

### Durability

- 9.1 Thermakraft 213 meets code compliance with NZBC Clause B2.3.1 [a] not less than 50 years for underlays used where the roof or wall cladding durability requirement or expected serviceable life is not less than 50 years, e.g. behind masonry roof tile cladding or masonry veneer. It also meets code compliance with NZBC Clause B2.3.1 [b] 15 years for underlays used where the roof or wall cladding durability requirement is 15 years.

### Serviceable Life

- 9.2 Thermakraft 213 is expected to have a serviceable life equal to that of the cladding. This is provided the cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant. In addition, the product must not be exposed to the weather or UV light for a total of more than 7 days prior to installation of the roofing or wall cladding.

### Control of Internal Fire and Smoke Spread

- 10.1 Thermakraft 213 has an AS 1530 Part 2 flammability index greater than 5. For Risk Groups other than SH, Thermakraft 213 must be enclosed by a suitable internal lining in occupied spaces [not exposed to view].

### Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to Thermakraft 213 from heat sources such as fireplaces, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions 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 Thermakraft 213 must only be used under claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1 or NASH Building Envelope Solutions, or claddings covered by a valid BRANZ Appraisal.
- 12.2 Thermakraft 213, when installed in accordance with the Technical Literature and this Appraisal, will assist in the total cladding system's compliance with NZBC Clause E2.

## Installation Information

### Installation Skill Level Requirement

- 13.1 All design and building work must be carried out in accordance with the Technical Literature and this Appraisal by competent and experienced tradespersons conversant with underlays. Where the work involves Restricted Building Work [RBW], this must be completed by, or under the supervision of, a Licensed Building Practitioner [LBP] with the relevant Licence Class.

### Underlay Installation

#### General

- 14.1 Thermakraft 213 must be fixed at maximum 300 mm centres to all framing members with large-head clouts 20 mm long, 6-8 mm stainless steel staples (for walls), 8-12 mm stainless steel staples (for roofs), self-drilling screws or proprietary underlay fixings. The underlay must be pulled taut over the framing before fixing.
- 14.2 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.3 Any damaged areas of Thermakraft 213, such as tears, holes or gaps around service penetrations, must be repaired. Damaged areas can be repaired by covering with new material lapping the damaged area by at least 150 mm and taping, or by taping small tears.

#### Roof Underlay

- 14.4 Thermakraft 213 may be run horizontally or vertically. The underlay must extend from the ridge and overhang the fascia board by no more than 20 mm.
- 14.5 Vertical laps must be no less than 150 mm wide. Horizontal laps must also be no less than 150 mm, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide.

#### Wall Underlay

- 14.6 Thermakraft 213 must be run horizontally and must extend from the upper-side of the top plate to the under-side of the bearers or wall plates supporting ground floor joists, or below bottom plates on concrete slabs. Horizontal laps must be no less than 150 mm wide, with the direction of the lap ensuring that water is shed to the outer face of the underlay. End laps must be made over framing and be no less than 150 mm wide.
- 14.7 Thermakraft 213 should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the underlay by cutting on a 45 degree diagonal from each corner of the penetration, folded into the opening and securely fastened.
- 14.8 Thermakraft 213 can be added as a second layer over head flashings in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.10.3 for timber framing or NASH Building Envelope Solutions Paragraph 9.1.11.3 for steel framing.

#### Inspection

- 14.9 The Technical Literature must be referred to during the inspection of Thermakraft 213 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 213 in accordance with NZBC Acceptable Solution E2/AS1, Table 23: tensile strength, edge-tear resistance and resistance to water vapour transmission in accordance with AS/NZS 4200.1, shrinkage in accordance with AS/NZS 4201.3, resistance to water penetration in accordance with AS/NZS 4201.4, surface water absorbency in accordance with AS/NZS 4201.6, pH of extract in accordance with AS/NZS 1301.421s and air resistance to BS 6538.3. A range of these tests were completed before and after Thermakraft 213 was exposed to UV light.
- 15.2 Testing was also completed to the Surface Water No-Drip Test method contained in BRANZ Study Report SR 228.



### Other Investigations

- 16.1 A durability opinion has been given by BRANZ technical experts.
- 16.2 The Technical Literature has been examined by BRANZ and found to be satisfactory.

### Quality

- 17.1 The manufacture of Thermakraft 213 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 roof underlay 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.
- 17.5 Quality on-site is the responsibility of the building contractor.
- 17.6 Building owners are responsible for the maintenance of Thermakraft 213, in accordance with the instructions of Kingspan Insulation NZ Limited.

### Sources of Information

- AS/NZS 1301.421s:1998 Determination of the pH value of aqueous extracts of paper, board and pulp - Cold extraction method.
- AS/NZS 4200.1:1991 Pliable building membranes and underlays - Materials.
- AS/NZS 4201.3:1991 Pliable building membranes and underlays - Methods of test - Shrinkage.
- AS/NZS 4201.4:1991 Pliable building membranes and underlays - Methods of test - Resistance to water penetration.
- AS/NZS 4201.6:1991 Pliable building membranes and underlays - Methods of test - Surface water absorbency.
- BS 6538.3:1987 Method for determination of air permeance using the Garley apparatus.
- BRANZ Study Report SR 228 [2010] Study of the Moisture Management Properties of Roof Underlays.
- NASH Building Envelope Solutions: 2019 Light steel framed buildings.
- NASH Standard Part Two: 2019 Light steel framed buildings.
- NZS 2295:2006 Pliable, permeable building underlays.
- 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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24 November 2022

THERMAKRAFT 213 BITUMINOUS  
ROOF AND WALL UNDERLAY



In the opinion of BRANZ, **Thermakraft 213 Bituminous Roof and Wall 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.

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For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

24 November 2022