



BRANZ Appraised

Appraisal No. 962 [2017]

THE THERMAKRAFT ONE WRAP SYSTEM



Appraisal No. 962 [2017]

BRANZ Appraisals

Technical Assessments of products for building and construction.



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BRANZ

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Product

- 1.1 The Thermakraft One Wrap System consists of Watergate Plus 295, Steelwrap 290, Thermakraft 220 and Covertek 403 Plus wall underlays; Aluband, Aluband Acrylic and Aluband Xtreme flexible flashing tapes, and Thermakraft Multi-Fit Penetration Seals.
- 1.2 The system is used behind wall cladding systems and around framed joinery openings as a secondary weather resistant barrier for walls.

Scope

- 2.1 The Thermakraft One Wrap System has been appraised for use as a flexible wall underlay system on timber and steel framed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - with direct fixed absorbent wall claddings; or,
 - with direct fixed non-absorbent wall claddings [for Watergate Plus, Steelwrap 290 and Covertek 403 Plus wall underlays], or direct fixed non-metallic, non-absorbent wall claddings [for Thermakraft 220]; or,
 - with absorbent and non-absorbent wall cladding installed over an 18 mm minimum drained cavity; or,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
 - situated in NZS 3604 Wind Zones up to and including Very High.
- 2.2 The Thermakraft One Wrap System has been appraised for use as a flexible wall underlay system over rigid wall underlays on timber and steel framed buildings within the following scope:
 - the scope limitations of NZBC Acceptable Solution E2/AS1, Paragraph 1.1 with regards to building height and floor plan area; and,
 - with absorbent and non-absorbent wall cladding installed over an 18 mm minimum drained cavity; or,
 - with masonry veneer in accordance with NZBC Acceptable Solution E2/AS1 for timber framed buildings or specific design for steel framed buildings; and,
 - situated in NZS 3604 Wind Zones up to and including Extra High.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, the Thermakraft One Wrap 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 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. The Thermakraft One Wrap System meets these requirements. See Paragraphs 9.1 - 9.2

Clause E2 EXTERNAL MOISTURE: Performance E2.3.2. When used as part of the cladding system, the Thermakraft One Wrap System will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. The Thermakraft One Wrap System meets this requirement and will not present a health hazard to people.

Technical Specification

4.1 System components and accessories supplied by Thermakraft Limited are as follows:

Flexible Wall Underlays

- **Watergate-Plus 295** is a non-woven, microporous polyolefin fabric underlay. Watergate-Plus 295 is coloured white. The product is supplied in rolls 1.370 m wide x 54.8 and 30 m long and 2.740 m wide x 30 and 18.5 m long. The product is printed with the Watergate-Plus 295 logo repeated along the length of the roll and is labelled with the marketing or construction company's name. The rolls are wrapped in clear polythene film.
- **Thermakraft Steelwrap 290** is a synthetic building underlay for use under wall claddings. The product consists of a micro-porous water-resistant film ultrasonically laminated to a layer of non-woven polyolefin. Thermakraft Steelwrap 290 is coloured white on the top and bottom faces. The product is supplied in rolls 1.370 m wide x 36.5 m and 73.0 m long, and 2.740 m wide x 18.5 m and 36.5 m long. The product is printed with the Thermakraft 290 logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.
- **Thermakraft 220** is a spun-bonded polypropylene, non-woven membrane. Thermakraft 220 is coloured white. The product is supplied in rolls 1.370 m wide x 55 m long and 2.740 m wide x 36.5 m long. The product is printed with the Thermakraft 220 logo repeated along the length of the roll and is labeled with the marketing or construction company's name. The rolls are wrapped in clear polythene film.
- **Thermakraft Covertex 403 Plus** consists of a micro-porous water-resistant film laminated between two layers of non-woven spun-bonded polyolefin. Thermakraft Covertex 403 Plus is coloured white on the top and bottom faces. The product is supplied in rolls 1.350 m wide x 18.6 m, 37.0 m and 55.0 m long. The product is printed with the Thermakraft Covertex 403 Plus logo repeated along the length of the roll. The rolls are wrapped in clear polythene film.

Accessories [supplied by the installer]

- **Fixings** – staples, clouts, screws or proprietary underlay fixings, or other temporary fixings to attach the wall underlay to the framing.
- **Wall underlay support** – polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens where required to support the wall underlay in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.

Flexible Flashing Tapes and Accessories

- **Thermakraft Aluband Window Flashing Tape** is a polymeric faced, bituminous modified, self-adhesive tape with a release backing paper. The tape is supplied in rolls 200, 150 and 75 mm wide x 25 m long. The rolls are wrapped in clear polythene film.
- **Thermakraft Aluband Acrylic Flashing Tape** is a pressure-sensitive self-adhering flexible flashing tape for use around window and door penetration openings. It is coloured white on the top surface with a blue release backing liner. The tape is available in rolls 75, 150 and 200 mm wide x 23 m long. The rolls are supplied in cartons.
- **Aluband XTREME Flashing Tape** is a self-adhering flexible flashing tape for use around window and door penetration openings. It is coloured grey on the top surface with a white release backing liner. The tape is available in rolls 75, 150 and 200 mm wide x 25 m long. The rolls are supplied in cartons.
- **The Thermakraft Corner Moulded Piece** is made from inert polyethylene and is coloured orange. It is used in conjunction with the flexible flashing tapes and wall underlays as part of the Thermakraft One Wrap System.
- **The Thermakraft Tool** is used to ensure proper adhesion of the flexible flashing tapes and to achieve a tight fit into corners.

Penetration Seals

- **Multi-Fit Penetration Seals** are manufactured with a black, soft and flexible 1.2 mm thick EPDM fabric supplied with pre-punched markings. The perimeter of the seal is coated with an acrylic adhesive, which is bonded to the wall underlay. Multi-Fit Penetration Seals are available in the sizes shown in Tables 1 and 2.

Table 1: Thermakraft Cable Seals

Marking Size Guide	
1	55 mm Ø fits an 80 mm Ø electrical box
2	4 x 3 mm Ø fits 7 mm Ø to 10 mm Ø
3	2 x 7 mm Ø fits 10 mm Ø to 22 mm Ø

Table 2: Thermakraft Pipe Seals

Marking Size Guide	
1	12 mm Ø fits round pipes from 15 mm Ø to 25 mm Ø
2	25 mm Ø fits round pipes from 40 mm Ø to 60 mm Ø
3	45 mm Ø fits round pipes from 60 mm Ø to 90 mm Ø
4	70 mm Ø fits round pipes from 90 mm Ø to 110 mm Ø

Handling and Storage

- 5.1 Handling and storage of all materials supplied by Thermakraft Limited, whether on or off site, is under the control of the installer. The materials must be protected from damage and weather. Rolls must be stored under cover, in clean, dry conditions, away from direct exposure to sunlight.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for the Thermakraft One Wrap 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 BRANZ Appraisals covering each of the Thermakraft One Wrap System components must be referred to for full design information. The relevant BRANZ Appraisals are:

Flexible Wall Underlays

- Appraisal No. 695 [2017] Watergate Plus 295 Fire Retardant Wall Underlay.
- Appraisal No. 867 [2016] Thermakraft Steelwrap 290 Wall Underlay
- Appraisal No. 912 [2016] Thermakraft 220 Wall Underlay
- Appraisal No. 918 [2016] Thermakraft 403 Plus Wall Underlay

Flexible Flashing Tapes

- Appraisal No. 878 [2014] Thermakraft Aluband Window Flashing Tape
- Appraisal No. 919 [2016] Thermakraft Aluband Acrylic Flashing Tape
- Appraisal No. 947 [2017] Aluband Xtreme Flashing Tape

Penetration Seals

- Appraisal No. 942 [2017] Multi-Fit Penetration Seals

7.2 The Thermakraft One Wrap System is intended for use behind wall cladding systems, at joinery openings, and pipe and cable penetrations as a secondary defence against water penetration into framing cavities.

7.3 The system will also provide a degree of temporary weather protection during construction. However, it will not make the building weathertight and some wetting of the underlying structure is always possible before the building is closed-in. The building must be closed-in and made weatherproof before moisture sensitive materials such as wall or ceiling linings and insulation materials are installed.

7.4 The flexible wall underlays used with the Thermakraft One Wrap System, excluding Thermakraft 220, are suitable for use as an air barrier to walls that are not lined, such as attic spaces at gable ends, as called up in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.4 [c].

7.5 The flexible flashing tapes used with the Thermakraft One Wrap System, meet the requirements of AC148:2001, which is an alternative solution to the version of AC148 referenced by NZBC Acceptable Solution E2/AS1, Paragraph 9.1.5 [b]. The installation methods for the flashing tapes is an alternative solution to the installation method shown within NZBC Acceptable Solution E2/AS1, Figures 72A and 72B.

7.6 Two layers of Thermakraft Aluband Acrylic Flashing Tape and Aluband Xtreme Flashing Tape must be used on the horizontal sill surface [a single layer is used in all other locations]. Thermakraft Aluband Window Flashing Tape requires only one layer on the horizontal sill surface.

7.7 Multi-Fit Penetration Seals provide an alternative solution to the pipe and service penetration detailing specified in NZBC Acceptable Solution E2/AS1, Paragraph 9.1.9.3 and Figure 68.

7.8 In cavity installations where the cavity battens are installed at greater than 450 mm centres, the flexible wall underlay must be supported between the battens to prevent the wall underlay bulging into the cavity space when bulk insulation is installed in the wall frame cavity in accordance with the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5. Wall underlay support options include polypropylene strap, 75 mm galvanised mesh or galvanised wire, or vertical cavity battens.

7.9 The Thermakraft One Wrap System is suitable for use under wall cladding as a wall underlay as called up in NZBC Acceptable Solution E2/AS1, Table 23 on timber framed buildings, except that where Thermakraft 220 is used, it must not be used with non-absorbent metal based sidings or metal based weatherboards in direct fixed situations. The Thermakraft One Wrap System is suitable for use under cavity based wall claddings as a non-absorbent synthetic wall underlay as called up in NZS 2295, Table 2.4 on steel framed buildings.



- 7.10 The Thermakraft One Wrap System is not designed to overcome poor detailing and workmanship of the wall cladding or window or door joinery. The system must not be considered in isolation, but be considered as part of the wall cladding system. The Thermakraft One Wrap System is designed to be used in conjunction with air seals and flashing systems, not as a substitute.
- 7.11 When the Thermakraft One Wrap System is used in conjunction with LOSP (light organic solvent preservative) treated timber, the solvent from the timber treatment must be allowed to evaporate [generally at least one week] prior to the installation of the system.

Structure

- 8.1 The Thermakraft One Wrap System is suitable for use in all Wind Zones of NZS 3604 up to, and including, Very High when used as a stand-alone flexible wall underlay system, and all Wind Zones of NZS 3604 up to, and including, Extra High when used as an overlay system for rigid wall underlays.

Durability

- 9.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of the Thermakraft One Wrap System both during normal use and maintenance of the building.

Serviceable Life

- 9.2 Provided the selected wall underlay, flexible flashing tape and penetration seal is not exposed to the weather or ultra-violet light for longer than stated in the relevant Appraisal, and provided the exterior cladding is maintained in accordance with the cladding manufacturer's instructions and the cladding remains weather resistant, the Thermakraft One Wrap System is expected to have a serviceable life equal to that of the cladding.

Control of Internal Fire and Smoke Spread

- 10.1 The flexible wall underlays used with the Thermakraft One Wrap System have an AS 1530 Part 2 flammability index of not greater than 5 and therefore meet the requirements of NZBC Acceptable Solutions C/AS2 to C/AS6, 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. They may therefore be used with no restrictions in all buildings.

Prevention of Fire Occurring

- 11.1 Separation or protection must be provided to the Thermakraft One Wrap System from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 - C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

External Moisture

- 12.1 The Thermakraft One Wrap System must be used behind claddings that meet the requirements of the NZBC, such as those covered by NZBC Acceptable Solution E2/AS1, or claddings covered by a valid BRANZ Appraisal.
- 12.2 The Thermakraft One Wrap System, when installed in accordance with the Technical Literature and this Appraisal will assist in the total cladding systems compliance with NZBC Clause E2.

Installation Information

Installation Skill Level Requirements

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

System Installation

Flexible Wall Underlays

- 14.1 The wall underlay must be fixed to all framing members at maximum 300 mm centres with large-head clouts 20 mm long, 6-8 mm staples, self-drilling screws or proprietary underlay fixings. The membrane must be pulled taut over the framing before fixing.
- 14.2 The wall underlay 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 membrane. End laps must be made over framing and be no less than 150 mm wide.
- 14.3 The wall underlay should be run over openings and these left covered until windows and doors are ready to be installed. Openings are formed in the membrane by cutting on a 45 degree diagonal from each corner of the penetration. The flaps of the cut membrane must be folded inside the opening and stapled to the penetration framing. Excess underlay may be cut off flush with the internal face of the wall frame.
- 14.4 The wall underlay 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.
- 14.5 When fixing the product in windy conditions, care must be taken due to the large sail area created.
- 14.6 Any damaged areas of the wall underlay, 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.
- 14.7 If the wall underlay is exposed to the weather or UV light for more than the maximum exposure period detailed within the relevant BRANZ Appraisal, then it must be replaced with new material.

Flexible Flashing Tapes

- 14.8 Before the flashing tape is applied, the substrate surfaces must be clean, dry and free from any surface contaminants such as dust and grease that may cause loss of adhesion.
- 14.9 Fit a Thermakraft Corner Moulded Piece into each of the bottom corners to create a seal at the corner junction. The corner piece must be fixed to the framing with staples or clouts.
- 14.10 A length of 150 or 200 mm wide flashing tape must be cut to the length of the sill plus 400 mm. The tape is installed flush with the interior face of the opening and is applied along the entire length of the sill and 200 mm up each jamb. The overhanging tape is cut at the corner of the opening to allow the tape to be folded onto the face of the wall underlay. The Thermakraft Tool must be used to ensure that adequate adhesion of the tape is achieved and that the tape is installed tight into the sill/jamb junction.
- 14.11 When Thermakraft Aluband Acrylic Flashing Tape or Thermakraft Aluband Extreme Flashing Tape is being used, a second layer of 75 mm wide tape must then be installed along the entire length of the sill. The tape is installed flush with the exterior face of the opening. This is a mandatory requirement for horizontal surfaces to ensure nail penetrations self-seal. [Note: this requirement does not apply when Thermakraft Aluband Flashing Tape is being used.]
- 14.12 A 400 mm length of flashing tape must be installed 200 mm down the jamb and 200 mm along the lintel at each of the top corners of the window or door joinery opening. A 75 mm wide x 100 mm long sealing tape 'butterfly' must be installed at 45° across the corner of the head/jamb junction overlapping the corner by 3 mm to create a seal at the corner junction.
- 14.13 The flashing tapes must not be stretched. To avoid wastage, the tapes can be lapped 100 mm minimum onto themselves without reducing the performance of the flashing tape system.
- 14.14 If the flashing tape is exposed to the weather or UV light for more than the maximum exposure period detailed within the relevant BRANZ Appraisal, then it must be replaced with new material.



Penetration Seals

- 14.15 The Multi-Fit Penetration Seal must create a tight seal around the pipe or cable penetration. The appropriate Multi-Fit Penetration Seal must be used based on the diameter of the pipe or cable penetration.
- 14.16 The wall underlay must be clean, dust free and dry prior to adhering the Multi-Fit Penetration Seal.
- 14.17 The Multi-Fit Penetration Seal must be installed in a diamond pattern, which will assist with moisture run-off.
- 14.18 If the Multi-Fit Penetration Seal is exposed to the weather or UV light for more than the maximum exposure period detailed within the relevant BRANZ Appraisal, then it must be replaced with a new seal.

Inspections

- 14.19 The Technical Literature must be referred to during the inspection of Thermakraft One Wrap System 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 the flexible wall underlays 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 the underlays were exposed to ultra-violet light.
- 15.2 The Flammability Index of the flexible wall underlays has been evaluated in accordance with AS 1530.2.
- 15.3 Testing of the flexible flashing tapes has been completed by BRANZ to the requirements of ICC Evaluation Service Acceptance Criteria for Flashing Materials AC148:2001. The adhesion of the flashing tapes to black bituminous Kraft building paper complying with the requirements of NZBC Acceptable Solution E2/AS1, Table 23 and selected other synthetic wall underlays has been tested and found to be satisfactory.
- 15.4 Testing after various forms of accelerated aging has confirmed the adhesion of Multi-Fit Penetration Seals to a range of flexible and rigid wall underlays. The results have been reviewed by BRANZ experts and found to be satisfactory.

Other Investigations

- 16.1 Durability opinions have been given by BRANZ technical experts.
- 16.2 Practicability of installation has been assessed by BRANZ and found to be satisfactory.
- 16.3 The Technical Literature, including installation instructions, has been examined by BRANZ and found to be satisfactory.



Quality

- 17.1 Details of the quality and composition of the materials used within the Thermakraft One Wrap System were obtained and found to be satisfactory. BRANZ undertakes an ongoing review of product quality on an inwards goods basis.
- 17.2 The quality of supply to the market is the responsibility of Thermakraft Limited.
- 17.3 Building designers are responsible for the design of the building, and for the incorporation of the Thermakraft One Wrap System into their design in accordance with the instructions of Thermakraft Limited.
- 17.4 Quality of installation is the responsibility of the installer in accordance with the instructions of Thermakraft Limited.

Sources of Information

- AC 148 [2001] Acceptance criteria for flashing materials ICBO Evaluation Service Inc. July 2001
- AS 1530.2: 1993 Test for flammability of materials.
- 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: 1994 Pliable building membranes and underlays - materials.
- AS/NZS 4201.3: 1994 Pliable building membranes and underlays - Methods of test - Shrinkage.
- BS 6538-3: 1987 Method for determination of air permeance using the Garley apparatus.
- NZS 2295: 2006 Pliable, Permeable Building Underlays.
- NZS 3604: 2011 Timber-framed buildings.
- Acceptable Solutions and Verification Methods for New Zealand Building Code External Moisture Clause E2, Ministry of Business, Innovation and Employment, Third Edition July 2005 (Amendment 7, 01 January 2017).
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.



BRANZ Appraised
Appraisal No. 962 [2017]

BRANZ Appraisal
Appraisal No. 962 [2017]
28 September 2017

THE THERMAKRAFT ONE WRAP
SYSTEM



In the opinion of BRANZ, **The Thermakraft One Wrap 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 **Thermakraft 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. **Thermakraft 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 **Thermakraft 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 **Thermakraft Limited** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

28 September 2017