



BRANZ Appraised

Appraisal No. 802 [2020]

MAMMOTH™ UNDERFLOOR INSULATION

Appraisal No. 802 [2020]

This Appraisal replaces BRANZ
Appraisal No. 802 [2014]

Amended 25 September 2024



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Mammoth™ Underfloor Insulation is a medium density, polyester thermal insulating material for use in suspended timber-framed floors. The insulation is pre-cut to suit a range of floor joist spacings.

Scope

- 2.1 Mammoth™ Underfloor Insulation has been appraised as a thermal insulation material for suspended timber-framed floors in new or existing domestic and commercial buildings.
- 2.2 Mammoth™ Underfloor Insulation is suitable for use under floors which have an enclosed perimeter foundation as defined in NZS 4246.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Mammoth™ Underfloor Insulation, 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 (b) not less than 15 years, (c) 5 years and B2.3.2. Mammoth™ Underfloor Insulation meets these requirements. See Paragraph 8.1.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mammoth™ Underfloor Insulation meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a) and H1.3.2 E. Mammoth™ Underfloor Insulation contributes to meeting these requirements. See Paragraphs 14.1 and 14.2.

Technical Specification

4.1 Mammoth™ Underfloor Insulation is manufactured from non-woven, thermally-bonded polyester fibres. The fibres are blended, either carded or Airlaid, and then thermally bonded and machine slit to the required width and length to produce segments and blankets. Mammoth™ Underfloor Insulation is available as set out in Table 1.

Table 1: Mammoth™ Underfloor Insulation Product Range

R-value	Nominal thickness [mm]	Width [mm]	Length [mm]	Density [kg/m ³]
Underfloor Blanket				
1.5 ¹	100	450, 510, 600 or 650	Various	7.5
1.8 ¹	115	450, 510, 600 or 650	Various	7.8
2.0 ¹	115	450, 510, 600 or 650	Various	10.0
Multi Underfloor Insulation				
1.9 ¹	90	370, 425, 475 or 580	1,140	16.7
2.8 ¹	140	370, 425, 475 or 580	1,140	15.2
3.2 ¹	140	370, 425, 475 or 580	1,140	20.8
3.4	140	370, 425, 475 or 580	1,140	35.7

¹These products have been assessed for a Group Number classification and achieved a Group Number of 1-S. For more information please refer to Paragraphs 10.2 and 11.2.

- 4.2 Mammoth™ Underfloor Insulation is off-white or grey in colour and is packaged in Mammoth™ Underfloor Insulation branded plastic packaging with labelling in compliance with AS/NZS 4859.1.
- 4.3 Accessories used with Mammoth™ Underfloor Insulation, which are supplied by the insulation installer, are staples suitable to fix the insulation to the suspended timber floor where required.

Handling and Storage

- 5.1 Mammoth™ Underfloor Insulation must be stored under cover and in dry conditions. Heavy objects must not be stacked on the packs. The packs must be stored in an orientation that avoids excessive compression of the product.
- 5.2 In general, insulation products are sensitive to the length of time they are stored in compression packaging. Product that does not recover to its nominal thickness may not achieve the stated thermal resistance [R-value].

Technical Literature

- 6.1 This Appraisal must be read in conjunction with:
- Underfloor Blanket Safety and Installation Guidelines, 11/22.
 - Underfloor Insulation Sections Safety and Installation Guidelines, 12 June 2024.
 - Underfloor Insulation Blanket TDS, 17 October 2023.
 - Underfloor Insulation Sections TDS, June 2024.
- 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 Mammoth™ Underfloor Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Mammoth™ Underfloor Insulation can be used to meet the minimum schedule method R-values of the NZBC Verification Methods H1/VM1, H1/VM2, NZBC Acceptable Solutions H1/AS1 or H1/AS2. Greater construction R-values can be achieved where specific design is used. For construction R-values, refer to the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.
- 7.2 Mammoth™ Underfloor Insulation R-values have been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.
- 7.3 Mammoth™ Underfloor Blanket is designed to be mechanically fixed using staples.
- 7.4 Mammoth™ Multi Underfloor Insulation sections are designed to be friction-fitted and may be mechanically fixed. The sections are supplied in widths and lengths to suit most installations.
- 7.5 Mammoth™ Multi Underfloor Insulation sections are not significantly affected by wind wash and therefore do not require to be lined. In fully open subfloors, it is recommended to line the subfloor to avoid animals from removing the insulation.
- 7.6 Mammoth™ Underfloor Blanket is suitable for use without additional lining material under floors which have an “enclosed perimeter foundation” as defined by NZS 4246, or a semi-enclosed perimeter foundation in accordance with NZS 3604 Paragraph 6.14.2. Where the subfloor area is fully open and therefore wind penetration is not reduced or eliminated, the insulation shall be protected by suitable lining material.
- 7.7 The building envelope must be constructed to ensure that the insulation remains dry during installation and throughout the life of the building.
- 7.8 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturer’s instructions and NZS 4246.

Durability

- 8.1 The durability assessment of Mammoth™ Underfloor Insulation to meet the requirements of the NZBC is based on the difficulty of access and replacement, and the ability to detect failure of the insulation, both during normal use and maintenance of the building.

Serviceable Life

- 8.2 Where the building is maintained so that the provisions of the NZBC E2 and E3 Clauses are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance, Mammoth™ Underfloor Insulation can expect to have a serviceable life of at least 50 years.

Maintenance

- 9.1 Insulation that has become damp must be removed and the cause of dampness repaired. The floor cavity must be clean and dry before refitting the insulation after drying or replacing with new Mammoth™ Underfloor Insulation. The dried or new insulation may require to be mechanically fastened. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.
- 9.2 For a serviceable life of 50 years, mechanical fastening of Mammoth™ Underfloor Insulation is recommended.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to the Multi Underfloor Insulation from heat sources such as fireplaces, heating appliances and chimneys. Part 7 of NZBC Acceptable Solution C/AS1 and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Downlights

- 10.2 Insulation should maintain 100 mm clearance from all undefined recessed luminaires, treating them as a heat source. For insulation to abut or cover recessed luminaires, these must be clearly marked as being suitable for having insulation abutting or covering them and have been installed in accordance with NZBC Acceptable Solution G9/AS1.

Fire Affecting Areas Beyond the Fire Source

Control of Internal Fire and Smoke Spread

- 11.1 Multi Underfloor Insulation R3.4 has not been tested. Table 4.3 of NZBC Acceptable Solution C/AS2 details the required Group Numbers for internal surface finishes. Internal surface finishes shall meet those requirements and are outside the scope of this Appraisal.
- 11.2 All other products listed in this Appraisal have a Group Number of 1-S and are therefore not subject to Paragraph 11.1. When used in an occupied space, these products may or may not be enclosed by an internal lining. Refer to the relevant NZBC Acceptable Solutions C/AS1 and C/AS2 for specific internal surface finish requirements. Internal surface finishes shall meet those requirements and are outside the scope of this Appraisal.

External Moisture

- 12.1 The total building envelope must be weathertight and comply with the requirements of NZBC Clause E2 to ensure that the insulation remains dry in use.
- 12.2 The moisture content of the construction materials at the time of installing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2 a), or a lower moisture content if required by the flooring manufacturer.

Internal Moisture

- 13.1 Buildings must provide an adequate combination of thermal resistance, ventilation and space temperature to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate. This does not apply to Communal Non-residential, Commercial, Industrial, Outbuildings or Ancillary buildings.

Energy Efficiency

- 14.1 Mammoth™ Underfloor Insulation will contribute to meeting the requirements of NZBC Clause H1 Performance H1.3.1 (a) and H1.3.2 E by compliance with NZBC Verification Methods H1/VM1, H1/VM2, NZBC Acceptable Solutions H1/AS1 or H1/AS2.
- 14.2 Mammoth™ Underfloor Insulation R-values have been determined by BRANZ testing to AS/NZS 4859.1 and are given in Table 1.

Installation Information

Installation Skill Level Requirement

- 15.1 All design and building work must be carried out in accordance with the Mammoth™ Underfloor Insulation Technical Literature and this Appraisal. All building work must be undertaken by competent and experienced tradespersons conversant with Mammoth™ Underfloor Insulation.

General

- 16.1 Installation of Mammoth™ Underfloor Insulation must be in accordance with the Technical Literature and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.
- 16.2 The product must be installed only when the building is enclosed and when the construction materials have achieved the required maximum moisture content or less.
- 16.3 Mammoth™ Underfloor Blanket is designed to be fitted between floor joists and hard against the floor board. They are then fixed with staples capturing the wedge of the blanket.



- 16.4 Mammoth™ Multi Underfloor Insulation sections are installed by friction-fitting the insulation between the floor joists. Where folding down occurs, it should not protrude below the joist. Where cutting is required, Mammoth™ Underfloor Insulation must be cut with an appropriate wide blade craft knife or insulation saw. There must be no gaps between subsequent installed sections otherwise the thermal performance will be compromised.
- 16.5 To maintain a good friction fit, Mammoth™ Underfloor Insulation sections are designed to be installed once. Removing and reinstalling the product can compromise the performance and the friction fit.
- 16.6 A minimum 100 mm gap must be maintained between plumbing downpipe work and Mammoth™ Underfloor Insulation. This gap will also ensure there is adequate access for servicing.
- 16.7 The clearance requirements for heating appliances, light fittings and downlights must be followed. Refer also to NZS 4246.
- 16.8 Mammoth™ Multi Underfloor Insulation does not need to be mechanically fastened. Sections must be at least 15 mm over the width of the cavity being installed. The long edge of the section is first held against the internal corner formed by the joist and floor junction. The body of the section is then press fit hard up under the floor. The sections can either be compressed between the floor joists [without folding] or the sections excess width can be folded down on one side.

Inspections

- 16.9 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Mammoth™ Underfloor Insulation installations.

Health and Safety

- 17.1 NZS 4246 gives guidance for health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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

Tests

- 18.1 BRANZ has carried out thermal resistance testing of Mammoth™ Underfloor Insulation in accordance with AS/NZS 4859.1.
- 18.2 BRANZ has carried out reaction to fire testing in accordance with ISO 5660 and fire testing in accordance with ISO 9705 of InZone Industries Ltd's polyester insulation to determine the group number of Mammoth™ Underfloor Insulation.

Other Investigations

- 19.1 An assessment of the durability of Mammoth™ Underfloor Insulation has been made by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature, including the installation instructions contained in the bales/packs have been reviewed by BRANZ and found to be satisfactory.
- 19.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality

- 20.1 The manufacture of Mammoth™ Underfloor Insulation has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, and quality and composition of the raw materials used were obtained and found to be satisfactory.
- 20.2 InZone Industries Ltd is responsible for the quality of the product supplied.
- 20.3 Quality of installation of the product on-site is the responsibility of the installer.
- 20.4 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.



Sources of Information

- AS/NZS 4859.1:2018 Thermal insulation materials for buildings.
- BRANZ House Insulation Guide [Sixth Edition], 2022.
- ISO 5660 Reaction-to-fire tests - Heat release, smoke production and mass loss rate.
- ISO 9705:1993 Fire tests - Full scale room test for surface products.
- NZS 4246:2016 Energy efficiency - Installing bulk thermal insulation in residential buildings.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 15 September 2020.

This Appraisal has been amended to update the installation details.

Amendment No. 2, dated 29 September 2022.

This Appraisal has been amended to update Table 1.

Amendment No. 3, dated 08 July 2024.

This Appraisal has been amended to reflect building code updates relating to NZBC H1 Energy Efficiency and to update Table 1.

Amendment No. 4, dated 25 September 2024.

This Appraisal has been amended to update Paragraphs 7.5 and 7.6 and the fire requirements in sections 10 and 11.



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MAMMOTH™ UNDERFLOOR
INSULATION



In the opinion of BRANZ, **Mammoth™ Underfloor Insulation** 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 **InZone 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. **InZone 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 **InZone 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 **InZone Industries Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

02 September 2020