

BRANZ Appraised

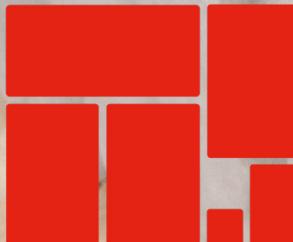
Appraisal No. 797 [2020]

MAMMOTH™ INSULATION

Appraisal No. 797 [2020]

This Appraisal replaces BRANZ Appraisal No. 797 [2014]

Amended 25 September 2024



Mammoth™
MODERN INSULATION

BRANZ Appraisals

Technical Assessments of products for building and construction.

Product

- 1.1 Mammoth™ Insulation is a range of polyester fibre thermal insulating material. The insulation is pre-cut to suit a range of thermal insulation requirements and framing set-outs in walls, ceilings and roofs of buildings.

Scope

- 2.1 Mammoth™ Insulation has been appraised as thermal insulating material for framed or part-framed walls, ceilings, and roofs of domestic and commercial buildings.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Mammoth™ 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 (a) not less than 50 years, B2.3.1 (b) 15 years and B2.3.2. Mammoth™ Insulation meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Mammoth™ Insulation contributes to meeting this requirement. See Paragraphs 13.1 and 13.2.

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

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

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Technical Specification

- 4.1 Mammoth™ 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™ Insulation is available as set out in Table 1.

Table 1: Mammoth™ Insulation Product Range

R-value	Nominal thickness [mm]	Width [mm]	Length [mm]	Density [kg/m ³]
Ceiling Blanket				
1.8 ^{1,2}	115	870	11,495	7.8
2.9 ^{1,2}	185	870	8,620	7.6 or 8.1
3.2 ^{1,2}	200	870	8,620	5.0
3.3 ²	210	870	8,620	7.6
3.6 ^{1,2}	225	870	7,470	8.0
4.0 ^{1,2}	240	870	5,747	8.3
Skillion Roof Sections				
2.9	115	560 or 860	1,200	32.8
3.2 ²	165	570 or 870	1,200	15.2
3.6	140	570	870	25.7
3.6	165	570	870	20.1
Wall Sections				
1.9 ²	90	360 or 560	760	16.7
2.0	70	360 or 560	760	51.4
2.0 ²	90	360 or 560	760	22.2
2.2 ²	90	360 or 560	760	26.7
2.5 ^{1,2}	90	360 or 560	760	40.0
2.8 ²	140	360 or 560	760	15.0
3.2 ²	140	360 or 560	760	20.8
3.6	140	360 or 560	760	25.7
Wall Blanket				
2.2 ²	90	360 or 570	9,870 or 10,800	21.6
2.6 ²	140	380 or 580	8,550 or 7,470	10.7
Masonry Blanket				
1.0 ²	45	580	12,930	16.7
1.3	45	360 or 560	2,400	42.2

¹These products can be manufactured on either a carded or Airlaid production line. The performance criteria have been evaluated and found to be the same.

²These 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™ Insulation is off-white in colour and is packaged in compression packaging with labelling in compliance with AS/NZS 4859.1.
- 4.3 Accessories used with Mammoth™ Insulation, which are supplied by the installer, are plastic strapping and fixings.

Handling and Storage

- 5.1 Mammoth™ 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 under 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:
 - Ceiling Insulation Blanket TDS, 12 June 2024.
 - Ceiling Blanket – Single Layer Safety and Installation Guidelines, June 2024.
 - Skillion Roof Insulation TDS, 12 June 2024.
 - Skillion Roof Sections Safety and Installation Guidelines, June 2024.
 - Wall Insulation Sections TDS, 12 June 2024.
 - Wall Section & Blanket Safety and Installation Guidelines, June 2024.
 - Wall Insulation Blanket TDS, 13 June 2024.
 - Masonry Insulation TDS, 22 August 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™ Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Mammoth™ 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™ 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™ Insulation blanket and section products are designed to be friction-fitted between wall, ceiling or roof framing. Mammoth™ Insulation can also be laid directly over ceiling lining, over ceiling battens or joists/truss chords. In other horizontal situations, the insulation must be adequately supported by a suitable durable material. Mammoth™ Insulation Skillion Roof Insulation is designed to be friction-fitted between rafters.
- 7.4 When insulation is double-layered over new or existing insulation, the possibility of compression of the bottom layer must be avoided or considered by reduction of R-values for the bottom layer of the formed system.
- 7.5 Where the insulation is installed in exterior walls, the insulation material nominal thickness must be selected to provide a snug close fit, which touches all sides of the insulation cavity between the wall underlay and the interior wall lining.
- 7.6 Where the insulation is retrofitted in external walls without a wall underlay, and with direct-fixed claddings, the insulation must be at least 20 mm thinner than the framing to allow a gap of at least 20 mm between the insulation and the wall cladding. Horizontal straps must be stapled into the sides of the wall studs at 300 mm centres maximum as support before the insulation is installed. Refer also to NZS 4246, Section 5.4.2.

- 7.7 When the insulation is installed in a wall with a drained cavity, it is recommended that specific wall products with a controlled nominal thickness be used. Where the stud spacings are greater than 450 mm, an intermediate means of restraining the insulation from bulging into the cavity must be installed in accordance with NZBC Acceptable Solution E2/AS1, Paragraph 9.1.8.5.
- 7.8 To prevent moisture transfer and to provide roof ventilation, a separation of 25 mm minimum is required between the insulation and any rigid substrate or flexible roof underlay. Selecting the specifically designed skillion roof insulation product with a controlled thickness can assist with this requirement.
- 7.9 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.10 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™ 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, then Mammoth™ 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. Cavities must be clean and dry before refitting the insulation after drying or replacing with new Mammoth™ Insulation. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

Prevention of Fire Occurring

- 10.1 Separation or protection must be provided to Mammoth™ 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 Mammoth™ Skillion Roof R2.9, R3.6 [at 140 mm and 165 mm thickness] and Wall R2.0 at 70 mm and Wall R3.6 products have 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 and enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, Paragraph 10.2 a], or lower moisture content if required by the lining 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.
- 13.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2 E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

- 14.1 Mammoth™ 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™ 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™ Insulation Technical Literature and this Appraisal. All building work must be undertaken by competent and experienced tradespersons conversant with Mammoth™ Insulation.

General

- 16.1 Installation of Mammoth™ 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™ Insulation must be released from the packaging and allowed to re-loft prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.
- 16.4 Mammoth™ Insulation is supplied in section and blanket form [see Table 1] and allows the product to be cut or torn to suit wall, ceiling or roof framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced. In wall cavities, the insulation must be neatly friction-fitted between framing members to prevent sagging and thermal convection. In ceiling or roofs, the insulation may be fitted between framing members or fitted over framing members. The insulation must extend to the external top plate. The insulation must not be folded, tucked or compressed. A close even fit provides the most efficient thermal performance. Wherever possible, the insulation should be fitted beneath wiring or plumbing.
- 16.5 The clearance requirements for heating appliances, light fittings and downlights must be followed. Refer also to NZS 4246.

Inspections

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

Health and Safety

- 17.1 Mammoth™ Insulation is safe to handle. 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™ 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™ Insulation.

Other Investigations

- 19.1 An assessment of the durability of Mammoth™ Insulation has been made by BRANZ technical experts.
- 19.2 The manufacturer's Technical Literature and installation instructions 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™ 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 Maintenance of the building is the responsibility of the building owner.

Sources of Information

- AS/NZS 4859.1:2018 Thermal insulation materials for buildings.
- BRANZ Bulletin No. 610 Preventing moisture problems in timber-framed skillion roofs.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- NZS 4246:2016 Energy Efficiency - Installing bulk thermal insulation in residential buildings.
- Ministry of Business, Innovation and Employment Records of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, 15 September 2022

This Appraisal has been amended to update Table 1 by including the R3.6 skillion roof product.

Amendment No. 2, 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. 3, 25 September 2024

This Appraisal has been amended to add the R1.3 Masonry product and to amend the fire requirements in sections 10 and 11.



In the opinion of BRANZ, **Mammoth™ 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