



BRANZ Appraised

Appraisal No.802 [2014]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 802 (2014)**

This Appraisal replaces Appraisal
No. 620 (2008) and Appraisal No. 802
(2014).

**MAMMOTH™
UNDERFLOOR
INSULATION**

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Product

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



Mammoth™
MODERN INSULATION



Scope

2.1 Mammoth™ Underfloor Insulation has been appraised as a thermal insulation material for timber framed floors in new or existing domestic and commercial buildings.

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(a) not less than 50 years and B2.3.1(b) 15 years. Mammoth™ Underfloor Insulation will meet these requirements. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Mammoth™ Underfloor Insulation will contribute to meeting this requirement. See Paragraph 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mammoth™ Underfloor Insulation meets this requirement and will not present a health hazard to people.

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

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. Mammoth™ Underfloor Insulation thermal resistance (R-value) has been determined by testing to AS/NZS 4859.1 which is an acceptable method.

Technical Specification

4.1 Mammoth™ Underfloor Insulation is manufactured from non-woven thermally bonded polyester fibres into machine slit sections. Mammoth™ Underfloor Insulation is available as set out in Table 1.

Table 1: Mammoth™ Underfloor Insulation product table

R-value	Nominal thickness (mm)	Width (mm)	Length (mm)	Nett Area (m ²)	Density (kg/m ³)
Mammoth™ Multi Underfloor Insulation					
1.9	90	370	1140	6.8	16.7
1.9	90	425	1140	7.8	16.7
1.9	90	475	1140	7.6	16.7
1.9	90	580	1140	7.9	16.7
1.9	90	370	800	2.4	16.7
1.9	90	425	800	2.7	16.7
1.9	90	475	800	2.7	16.7
1.9	90	580	800	2.8	16.7
1.9	90	600	1200	3.6	16.7
Mammoth™ Novafloor Insulation					
1.4	55	375	1200	6.3	32.7
1.4	55	435	1200	7.3	32.7
1.4	55	485	1200	7.6	32.7
1.4	55	535	1200	7.1	32.7
1.4	55	580	1200	7.0	32.7
1.4	55	600	1200	5.8	32.7
1.4	55	650	1200	6.2	32.7

4.2 Mammoth™ Underfloor Insulation is off-white or grey in colour and is packaged in a clear or Mammoth™ branded plastic packaging with labelling in compliance with AS/NZS 4859.1.

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 R-value.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Mammoth™ Underfloor Insulation. 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 Mammoth™ Underfloor Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Mammoth™ Underfloor Insulation R-values of 1.4 m²C/W and 1.9 m²C/W is designed to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Greater construction R-values can be achieved where specific design is used. For construction R-values refer to BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.

7.2 Mammoth™ Multi Underfloor Insulation is designed to be friction-fitted and may be mechanically fixed. The sections are supplied in widths and lengths to suit most installations.

7.3 Mammoth™ Novafloor Insulation is intended to be friction-fitted and must not be mechanically fixed. The sections are supplied in widths and lengths to suit most installations.

7.4 Mammoth™ Underfloor Insulation is not significantly affected by wind wash in partially closed subfloors due to its density. In fully open situations such as pole frame buildings the underside of the floor must be lined.

7.5 The building envelope must be constructed to ensure that the insulation remains dry during installation and throughout the life of the building.

7.6 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246. See Paragraph 10.1.

Durability

Serviceable Life

8.1 Where the building is maintained so that 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.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Mammoth™ Underfloor Insulation from heat sources such as fire places, heating appliances, flues, chimneys and recessed luminaires (except classed IC - F). Refer to Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1.

Control of Internal Fire and Smoke Spread

11.1 Mammoth™ Underfloor Insulation has a Group Number of 3. Where the ceiling of an occupied space forms the underside of the thermal envelope, Mammoth™ Underfloor Insulation may or may not need to be enclosed by an internal lining depending on the Risk Group. Refer to the relevant NZBC Acceptable Solutions C/AS1 to C/AS6 for specific internal surface finish and sub floor space requirements.

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 Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Refer to Paragraphs 7.1 - 7.6.

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 Requirements

15.1 Installation of Mammoth™ Underfloor Insulation must be completed by installers with an understanding of insulation installation.

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 Insulation is 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.

16.4 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.

16.5 A minimum 100 mm gap must be maintained between plumbing down pipe work and Mammoth™ Underfloor Insulation. This gap will also ensure there is adequate access for servicing.

16.6 The clearance requirements for heating appliances, light fittings and downlights must be followed. Refer also to NZS 4246.

Mammoth™ Multi Underfloor Insulation

16.7 Mammoth™ Multi Underfloor Insulation does not need to be mechanically fastened. Sections must be at least 25 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.

Mammoth™ Novafloor Insulation

16.8 A long edge of the Mammoth™ Novafloor Insulation section is first held against the internal corner formed by the joist and floor junction. The body of the Mammoth™ Novafloor Insulation section is then press fit hard up under the floor. The trailing edge is folded down so that the friction-fit is complete. The folded edge can be up to 75 mm long without compromising the thermal performance. However, the folded edge must conform to Paragraph 16.3.

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 Insulpro Manufacturing Ltd 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 Insulpro Manufacturing 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: 2002 Materials for the thermal insulation of buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- Compliance Document for New Zealand Building Code Energy Efficiency Clause H1, Third Edition October 2007 (including Amendment 2, October 2011)
- 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.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- NZS 4214: 2006 Method of determining the total thermal resistance of parts of buildings.
- NZS 4218: 2004 Energy efficiency - housing and small building envelope.
- NZS 4243: 1996 Energy efficiency - large buildings.
- NZS 4246: 2006 Energy efficiency - Installing Insulation In Residential Buildings.
- The Building Regulations 1992.



BRANZ

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 **Insulpro Manufacturing 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. **Insulpro Manufacturing 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.
3. 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.
4. 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 **Insulpro Manufacturing Limited**.
5. 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.
6. BRANZ provides no certification, guarantee, indemnity or warranty, to **Insulpro Manufacturing Limited** or any third party.

For BRANZ

C Percy
Chief Executive

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