



BRANZ Appraised

Appraisal No.797 [2012]

BRANZ Appraisals

Technical Assessments of products
for building and construction

BRANZ
APPRAISAL
No. 797 (2012)

Amended 13 November 2012

MAMMOTH™
INSULATION

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Product

1.1 Mammoth™ Insulation is a range of polyester fibre thermal insulating material for use in walls, roofs and ceilings of buildings.



Mammoth™
MODERN INSULATION



Scope

2.1 Mammoth™ Insulation has been appraised as thermal insulating material in walls, roofs and ceilings of buildings within the following scope:

- framed or part-framed domestic and commercial buildings where the insulation remains dry during its serviceable life.

2.2 Mammoth™ Insulation must be installed in accordance with the relevant requirements of NZS 4246, the Technical Literature and this Appraisal, to meet the stated thermal performance rating of the insulation. See Paragraph 6.1.

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 and B2.3.1(b) 15 years. Mammoth™ Insulation will meet this requirement. See Paragraph 8.1.

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

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Mammoth™ 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™ Insulation will contribute to meeting these requirements. See Paragraphs 13.1 – 13.8.

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

Technical Specification

Polyester Insulation

4.1 Mammoth™ Insulation is manufactured from non-woven thermally bonded polyester fibres. The fibres are blended and thermally bonded to produce blankets and sections, which are machine slit to the required width and cut to length. The products are then compression packed into plastic bags.

4.2 The product is available as set out in Table 1.

Table 1: Product Range

Description	Unit	R-Value	Nominal Thickness (mm)	Dimensions (mm)		Pieces per pack	Total area (m ²)	Weight gsm	Weight kg
				Width	Length				
Mammoth™ R 1.8 435mm Ceiling	Bale	1.8	115	435	11495	2	10	0900	9
Mammoth™ R 1.8 870mm Ceiling	Bale	1.8	115	870	11495	1	10	0900	9
Mammoth™ R 2.9 435mm Ceiling	Bale	2.9	185	435	8620	2	7.5	1400	10.5
Mammoth™ R 2.9 870mm Ceiling	Bale	2.9	185	870	8620	1	7.5	1400	10.5
Mammoth™ R 3.2 435mm Ceiling	Bale	3.2	200	435	8620	2	7.5	1600	12
Mammoth™ R 3.2 870mm Ceiling	Bale	3.2	200	870	8620	1	7.5	1600	12
Mammoth™ R 3.6 435mm Ceiling	Bale	3.6	225	435	7470	2	6.5	1800	11.7
Mammoth™ R 3.6 870mm Ceiling	Bale	3.6	225	870	7470	1	6.5	1800	11.7
Mammoth™ R2.0 Wall Sections 380mm	Pack	2.0	90	380	1160	16	7.05	1500	10.58
Mammoth™ R2.0 Wall Sections 580mm	Pack	2.0	90	580	1160	11	7.4	1500	11.1
Mammoth™ R2.2 Wall Sections 360mm	Pack	2.2	90	360	1160	14	5.85	1950	11.4
Mammoth™ R2.2 Wall Sections 560mm	Pack	2.2	90	560	1160	9	5.85	1950	11.4
Mammoth™ R2.5 Wall Sections 360mm	Pack	2.5	90	360	1160	9	3.76	3150	11.84
Mammoth™ R2.5 Wall Sections 560mm	Pack	2.5	90	560	1160	6	3.9	3150	12.28
Mammoth™ R 2.2 Wall Blanket 360mm	Bale	2.2	90	360	9870	2	7.11	1950	13.86
Mammoth™ R 2.2 Wall Blanket 560mm	Bale	2.2	90	560	10800	1	6.05	1950	11.79
Mammoth™ R 2.6 Wall Blanket 380mm	Bale	2.6	140	380	8550	4	13	1500	19.49
Mammoth™ R 2.6 Wall Blanket 580mm	Bale	2.6	140	580	7470	3	13	1500	19.5
Mammoth™ R1.9 Multi 370mm	Pack	1.9	90	370	1140	16	6.75	1500	10.12
Mammoth™ R1.9 Multi 425mm	Pack	1.9	90	425	1140	16	7.75	1500	11.63
Mammoth™ R1.9 Multi 475mm	Pack	1.9	90	475	1140	14	7.58	1500	11.37
Mammoth™ R1.9 Multi 580mm	Pack	1.9	90	580	1140	12	7.93	1500	11.9
Mammoth™ R1.9 Multi Handypack 370mm	Pack	1.9	90	370	800	8	2.37	1500	3.55
Mammoth™ R1.9 Multi Handypack 425mm	Pack	1.9	90	425	800	8	2.72	1500	4.08
Mammoth™ R1.9 Multi Handypack 475mm	Pack	1.9	90	475	800	7	2.66	1500	3.99
Mammoth™ R1.9 Multi Handypack 580mm	Pack	1.9	90	580	800	6	2.78	1500	4.18
Mammoth™ R1.9 Multi Handypack 600mm	Pack	1.9	90	600	1200	5	3.6	1500	5.4

Note: Insulation must not be fitted into sealed cavities that are less than the labelled insulation nominal thickness.

4.3 Mammoth™ Insulation is white in colour and is packaged in clear compression packaging.

Each packet is supplied with Technical Literature and labelling in compliance with AS/NZS 4859.1

4.4 Accessories used with Mammoth™ Insulation which are supplied by the Insulation Installer are :

- Plastic strapping – Where plastic strapping is used to control the insulation material from movement that would affect the performance of the thermal insulation, strapping that meets the requirements of NZBC Clause B2 Durability: Performance B2.3.1(a) 50 years, must be used.
- Plastic strapping fixings – Plastic strapping fixings such as hot dipped galvanised clouts or zinc plated staples that meet the requirements of NZBC Clause B2 Durability: Performance B2.3.1(a) 50 years.

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. The longer they are stored, the longer it will take for them to recover to their natural loft after unpacking.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Mammoth™ 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™ Insulation is designed to be used as thermal insulation to meet the energy efficiency and other NZBC insulation requirements, or to provide greater ratings when required by the designer, when installed in building walls, ceilings and roofs.

7.2 Mammoth™ Insulation blanket and section products are designed to be friction-fitted between wall, ceiling or roof framing. They are supplied in a range of R-values that with NZS 4214 are able to meet the minimum requirements of NZS 4218 for walls, ceilings and roofs.

7.3 Mammoth™ Insulation blanket and section products have been designed for commercial and residential applications. Installation must be completed in accordance with NZS 4246, this Appraisal and the manufacturer's Technical Literature.

7.4 Mammoth™'s R1.9 Multi products are designed for use in walls, ceilings, roofs and underfloors in commercial and residential buildings. Mammoth™ Multi Insulation must be installed in accordance with NZS 4246, this Appraisal and the manufacturer's Technical Literature. (The use of Mammoth™ Multi as underfloor insulation has not been assessed and is outside the scope of this Appraisal.)

7.5 Subject to the maximum compression density and storage conditions not being exceeded, all products covered by this Appraisal should recover to their nominal thickness within 72 hours after being removed from their compressed bales.

7.6 The building envelope must be constructed to meet the requirements of the NZBC. The insulation must remain dry during installation and throughout the life of the building.

7.7 To prevent moisture transfer in skillion roof applications, a separation (minimum of 25mm) is required between the insulation and any rigid substrate or flexible roof underlay.

7.8 The clearances specified in the Technical Literature, or specified by the manufacturer of heating appliances and ventilation systems, must be met.

7.9 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. For products that are over lofting and 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.

7.10 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.

7.11 Where the insulation material is not laid directly on a ceiling lining or over ceiling battens or joists, it must be adequately supported by galvanised wire netting or some other suitable corrosion resistant material.

Recessed Lights

7.12 Installing recessed downlights (RDL's) in a ceiling or roof forms a gap in the thermal envelope, reducing the overall thermal performance.

7.13 The overheating risk to the RDL is also affected by the surrounding materials.

7.14 Designers need to confirm that the specified lights are suitable for the specific application and that sufficient ventilation is available for cooling of the RDL as specified by the manufacturer, AS/NZS 60598-2.2 Amendment A, and as required by AS/NZS 3000 (Wiring Rules).

7.15 When installing RDL's in skillion roofs, the RDL must not protrude into the ventilation gap required between the insulation and roof substrate or cladding.

7.16 Compensation for the loss of insulation due to the presence of RDL's must be made, to meet the requirements of NZBC Clause H1. One RDL per square metre can be responsible for the loss of 10% of the insulation value of the ceiling. NZS 4246 and the BRANZ House Insulation Guide provide further guidance.

7.17 Mammoth™ Insulation is suitable for use with RDL's rated as CA80, CA135 (abutted) and IC, IC-F (abutted and covered) in line with the requirements of AS/NZS 60695-2.2 amendment A.

7.18 During insulation installation in a skillion roof, gaps in the insulation must be provided to allow the subsequent installation of the RDL, driver/controller and wiring.

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 (e.g. moisture), and where the material is accessible then Mammoth™ Insulation can expect to have a serviceable life of at least 15 years. Mammoth™ Insulation can also expect to have a serviceable life of 50 years when installed in dry, non-accessible enclosed construction cavities.

Maintenance

9.1 The building must be maintained weatherproof at all times. If, during normal routine maintenance it is discovered that moisture has entered the building envelope, or that dampness has occurred because of leaking plumbing or some other source, then that source must be repaired immediately. Wet or damp insulation must be removed and then replaced with new insulation of an equivalent thermal rating. Cavities must be clean, dry and free of all contaminants and mould before fitting new insulation. NZS 4246 Paragraph 3.3 gives guidance on thermal insulation maintenance due to water damage.

Outbreak of Fire

10.1 Mammoth™ Insulation must be separated or protected from sources of heat such as chimneys, fireplaces, flues and fuel burning appliances in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9.

External Moisture

11.1 The total building envelope must comply with the requirements of NZBC E2 to ensure that the insulation remains dry in use.

11.2 The moisture content of the construction materials at the time of enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, or lower moisture content if required by the lining manufacturer.

Internal Moisture

12.1 Buildings other than communal non-residential, commercial, industrial, outbuildings or ancillary buildings, must be constructed with an adequate combination of thermal resistance, ventilation, and space temperature must be provided to all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate.

12.2 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 E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

Energy Efficiency

13.1 The Performance Requirement NZBC Clause H1.3.1 (a) and H1.3.2 E can be met by using the following methods.

Modelling of housing and smaller buildings

13.2 The modelling method described in NZS 4218 section 3.3 (as modified by NZBC Verification Method H1/VM1 Paragraphs 1.1.2 and 1.1.3) is a Verification Method for NZBC Clause H1.3.1(a) for the following types of buildings:

- a) Housing, regardless of total floor area (the method is also a means of compliance with H1.3.2 E, which applies only to housing), and
- b) Small buildings other than housing having a net lettable area no greater than 300 m².

Building performance index for housing

13.3 Compliance with NZBC Clause H1.3.2 E (Building Performance Index or BPI) satisfies Clause H1.3.1(a).

Modelling of large buildings other than housing

13.4 The modelling method described in NZS 4243.1 section 4.4 is a Verification Method for NZBC Clause H1.3.1(a) for buildings other than Housing having a net lettable area greater than 300 m².

Building Thermal Envelope

13.5 NZBC Acceptable Solution H1/AS1 can be used for housing, communal residential, communal non-residential and commercial buildings.

Housing and Small Buildings

13.6 Construction in accordance with NZS 4218 sections 3.1 or 3.2 (as modified by NZBC Acceptable Solution H1/AS1 Paragraphs 2.1.3 and 2.1.4) satisfies NZBC H1.3.1 (a) for housing of any size and all buildings having a net lettable area no greater than 300 m².

13.7 Construction in accordance with NZS 4218 sections 3.1 or 3.2 (as modified by NZBC Acceptable Solution H1/AS1 Paragraphs 2.1.3 and 2.1.4) satisfies NZBC H1.3.2 E for housing of any size, including the external walls of multi-unit dwellings. *(Note that common walls between household units of multi-unit dwellings need not comply with NZS 4218.)*

Large Buildings other than Housing

13.8 Construction in accordance with NZS 4243.1 part 4.2 or 4.3, NZS 4243.1 part 4.3, NZS 4218 part 3.1 or 3.2 satisfies the requirements of NZBC H1.3.1(a) for the thermal resistance of the building envelope in large buildings other than housing having a net lettable area greater than 300 m².

Installation Information

Installation Skill Level Requirements

14.1 Installation of Mammoth™ Insulation must be completed by an installer with an understanding of insulation installation, in accordance with the instructions given within the Technical Literature, Installation Instructions and this Appraisal.

General

15.1 Installation of Mammoth™ Insulation must be in accordance with the manufacturer's Technical Literature, Installation Instructions and this Appraisal. Installation is to be carried out by trained installers only. NZS 4246 should be used as a guide for installing insulation in residential buildings.

15.2 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, to ensure the insulation does not become wet.

Recessed Downlights

15.3 When retrofitting insulation into ceilings with existing RDL's, the installer must establish the RDL's rating prior to installation. If the RDL's rating cannot be established clearances in line with NZS 4246 must be maintained. The effect that the gaps have on the overall thermal performance must be considered.

15.4 When installing insulation prior to the luminaries, consideration should be given to the gaps required for the subsequent installation of the RDL, driver/controller and wiring.

Inspections

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

Health and Safety

16.1 Mammoth™ Insulation is safe to handle without protective clothing. However, it is recommended that a dust mask and eye protection be worn when installing the product to provide protection from dust that may be disturbed.

Basis of Appraisal

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

Tests

17.1 BRANZ has carried out thermal resistance testing of Mammoth™ Insulation in accordance with AS/NZS 4859.1: 2002.

Other Investigations

18.1 An assessment of the durability of Mammoth™ Insulation has been made by BRANZ technical experts.

18.2 The manufacturer's Technical Literature and Installation Instructions have been reviewed by BRANZ and found to be satisfactory.

18.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality

19.1 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.

19.2 Insulpro Manufacturing Ltd is responsible for the quality of the product supplied.

19.3 Quality of installation of the product on site is the responsibility of the installer.

19.4 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, Fourth Edition 2010.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- 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 incorporating amendment No 1 – Installing Insulation In Residential Buildings.
- Compliance Document for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition, August 2007.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition (Amendment 12, 10 October 2011).
- The Building Regulations 1992.



BRANZ

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 Insulpro Manufacturing 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. Insulpro Manufacturing 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.
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 Ltd.
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 Ltd or any third party.

For BRANZ

P Burghout
Chief Executive

Amendment No.1, dated 13 November 2012.

This Appraisal has been amended to update the contact details and add a Trademark to the Product Name.

Date of issue: 19 October 2012