



BRANZ Appraised

Appraisal No.645 [2009]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 645 (2009)**

**INSUL-FLUF
LOOSE-FILL
INSULATION**

Insulation Specialists Ltd
P.O. Box 109
Feilding

Freeph: 0800 102 200
Email: info@insul-fluf.co.nz
Web: www.insul-fluf.co.nz



BRANZ
BRANZ Limited
Private Bag 50 908
Porirua City
New Zealand
Tel: +64 4 237 1170
Fax: +64 4 237 1171
www.branz.co.nz



Product

1.1 Insul-fluf is a cellulose fibre loose-fill thermal insulation for lined ceilings.



Scope

2.1 Insul-fluf Insulation has been appraised as a thermal insulation material for ceilings of buildings within the following scope:

- Framed accessible lined ceiling space in new or existing domestic and commercial buildings; and,
- installed where the insulation remains dry during its serviceable life.

2.2 Insul-fluf must be installed in accordance with the Technical Literature to meet the stated thermal performance rating of the insulation. See Paragraph 6.1.

2.3 Installations must be carried out only by Insul-fluf Licensed Installers.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Insul-fluf 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) 15 years. Insul-fluf Insulation meets this requirement. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Insul-fluf Insulation will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Insul-fluf 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. Insul-fluf 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. Insul-fluf Insulation thermal resistance (R-value) has been determined by testing to AS/NZS 4859.1 which is an acceptable method.

Technical Specification

Cellulose Loose-fill Insulation

4.1 Insul-fluf Insulation is manufactured from 100% clean recovered paper to make cellulose fibre. The fibres consist of a mixture of at least 90 % clean newsprint and up to 10% glossy magazines which is mechanically processed in a hammer mill. A fire retardant, boric acid is added to the mixture. The insulation material is then bagged and ready for transportation to site. Insul-fluf Insulation is yellow / grey in colour.

4.2 On site, the insulation material is mechanically blown into the ceiling space to the desired density and depth for the appropriate R-value. The product is blown at a greater depth than the stabilised thickness as settling will occur. Table 1 details the product R-value and stabilised thickness.

Table 1

R-value	Stabilised Thickness	Installed Thickness*	R-Value	Minimum kg/m ²
2.6	120 mm	156 mm	2.6	5.4
2.9	140 mm	182 mm	2.9	6.3
3.3	165 mm	215 mm	3.3	7.4

*Minimum levelled thickness directly after installation.

4.3 Each installation is supplied with attached labelling in compliance with AS/NZS 4859.1.

Handling and Storage

5.1 Insul-fluf Insulation must be stored under cover and in dry conditions.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Insul-fluf 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 Insul-fluf 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 ceilings.

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

7.3 To prevent moisture transfer to Insul-fluf Insulation, a separation (minimum 25 mm) is required between Insul-fluf Insulation and any flexible roof underlay. Where there is a rigid sheathing or roofing substrate such as plywood, provided there is no design requirement for roof space ventilation, a separation between Insul-fluf Insulation and the sheathing or substrate is not required. This situation would normally occur at the external roof wall junction.

7.4 The clearances specified in the installation instructions, or specified by the manufacturer of heating appliances and recessed light fittings must be met. The use of recessed light fittings may, therefore, reduce the thermal performance of insulated ceilings. This factor must be taken into account in the assessment of compliance with NZBC Clause H1 Energy Efficiency.

7.5 The use of Insul-fluf Insulation in skillion roofs and any enclosed cavities where the product cannot be inspected is out side the scope of this Appraisal.

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 wind), then it can be expected to have a serviceable life of at least 50 years. Insul-fluf Insulation must be installed in a dry, protected construction.

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. Ceiling surfaces 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 Insul-fluf 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 Clause E2 to ensure that the insulation remains dry in use.

11.2 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 11.2(a), or a 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 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 Acceptable Solution E3/AS1 than that to satisfy the energy efficiency provisions alone.

Energy Efficiency

Building Thermal Envelope

13.1 NZBC Verification Method H1/VM1 can be used for housing, Communal Residential, Communal Non-residential and Commercial Buildings.

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:

- 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,
- 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.

Determining Thermal Resistance

13.5 The thermal resistance (R-values) of building elements may be verified by using NZS 4214.

The BRANZ 'House Insulation Guide' Third Edition provides thermal resistances of common building elements and is based on calculations from NZS 4214.

Building Thermal Envelope

13.6 NZBC Acceptable Solution H1/AS1 can be used for Housing, Communal Residential, Communal Non-Residential and Commercial buildings.

Housing and Small Buildings

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 H1.3.1 (a) for housing of any size and all buildings having a net lettable area no greater than 300 m².

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.)

Installation Information

Installation Skill Level Requirements

14.1 Installation of Insul-fluf Insulation must only be completed by a trained and Licensed Insul-fluf Installer. .

General

15.1 Installation of Insul-fluf Insulation must be in accordance with the manufacturer's Technical Literature, Installation Instructions and this Appraisal. 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.

15.3 Insul-fluf Insulation is blown into lined ceilings to the required R-value by an external blowing machine.

15.4 Insul-fluf Insulation is installed at a thickness greater than the stabilised thickness to allow for settlement (See Table 1). Settlement of Insul-fluf Insulation may continue to occur for a number of years.

15.5 The insulation must be continuous across the entire ceiling plane between top plates of external walls, and installed either between or over rafters, ceiling joists or truss chords. Wherever possible the insulation should be installed beneath wiring or plumbing.

15.6 Where recessed light fittings are fitted, installation of the insulation material and the light fittings must be in accordance with NZBC C/AS1 Paragraph 9.4. If a gap in the insulation material is required around light fittings, the effectiveness of the thermal envelope will be diminished when the insulation does not form a continuous envelope. If necessary additional insulation must be added to compensate.

15.7 A ring of glasswool insulation or preformed aluminium is installed around recessed light fittings and heat sources to avoid accidental movement of Insul-fluf Insulation and the loss of minimum clearances.

Inspections

16.1 The Technical Literature must be referred to during the inspection of Insul-fluf Insulation installations.

Health and Safety

17.1 Insul-fluf Insulation is easy 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 Insul-fluf Insulation in accordance with ASTM C518 as part of the material test evaluation to AS/NZS 4859.1.

Other Investigations

19.1 An assessment of the durability of Insul-fluf 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 The performance of Insul-fluf Insulation in New Zealand since 1989 has been considered by BRANZ.

Quality

20.1 The manufacture of Insul-fluf 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 Insulation Specialists Ltd is responsible for the quality of the product supplied.

20.3 Quality of installation of the product on site is the responsibility of Insul-fluf Licensed Installers.

20.4 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, Third Edition 2007.
- 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
- 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, May 2007.
- The New Zealand Building Regulations 1992, up to, and including June 2007 Amendment.



BRANZ

In the opinion of BRANZ, [Insul-fluf Loose-fill 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 [Insulation Specialists 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. [Insulation Specialists 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 [Insulation Specialists 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 [Insulation Specialists Ltd](#) or any third party.

For BRANZ

P Burghout
Chief Executive

Date of issue: 23 February 2009