BRANZ Appraised
Appraisal No. 464 [2019]

*eco*FLEECE® SHEEP'S WOOL INSULATION

Appraisal No. 464 (2019)
This Appraisal replaces BRANZ Appraisal No. 464 (2012).

BRANZ Appraisals

Technical Assessments of products for building and construction.

Eco Insulation Systems Ltd
PO Box 77-059
Mt Albert
Auckland, 1350
Tel: 0800 400 326
Email: inquiries@ecoinsulation.co.nz
Web: www.ecoinsulation.co.nz

BRANZ
1222 Moonshine Rd,
RD1, Porirua 5381
Private Bag 50 908
Porirua 5240,
New Zealand
Tel: 04 237 1170
branz.co.nz

Product

1.1 ***eco***fleece® Sheep's Wool Insulation is a range of thermal insulating materials manufactured from sheep's wool and polyester fibre. The insulation is pre-cut into blankets of different width to suit a wide range of thermal insulation requirements and framing set-outs in walls, ceilings and roofs of buildings.

Scope

2.1 ***eco***fleece® Sheep's Wool Insulation has been appraised as a thermal insulation 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, *eco*fleece® Sheep's Wool 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. ***eco***fleece® Sheep's Wool Insulation will meet these requirements. See Paragraph 8.1

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. ***eco***fleece® Sheep's Wool Insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. ***eco***fleece® Sheep's Wool 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. ***eco***fleece® Sheep's Wool Insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

Technical Specification

4.1 ***eco***fleece® Sheep's Wool Insulation is a thermally bonded blend of 60% coloured sheep's wool fibres sourced from manufacturers of woollen products, and 40% thermally bonded polyester fibres. It is formed into blankets and subsequently slit to the required widths, compressed and packaged. ***eco***fleece® Sheep's Wool Insulation is available as set out in Table 1.

Table 1: *eco*fleece® Sheep's Wool Insulation product range

R-value	Nominal Thickness (mm)	Length (mm)	Width (mm)	Nett Area (m²)	Density (kg/m³)
Ceiling/Wall					
2.6	145	8,620	580	10.00	12.4
Ceiling					
3.2	180	6,900	870	6.00	11.4
Wall					
2.2	90	6,890	580	8.00	23.3
Ceiling Double Layer					
2.2/4.3	90/180	6,890	580	8.00	23.3
2.6/5.1	140/280	8,620	580	10.00	12.4

4.2 ***eco***fleece® Sheep's Wool Insulation is grey in colour and is packaged in pre-printed plastic compressed bags with labelling in compliance with AS/NZS 4859.1. Each package label contains installation instructions.

4.3 Accessories used with ***eco***fleece® Sheep's Wool Insulation, which are supplied by the insulation installer, are plastic strapping and associated fixings.

Handling and Storage

5.1 ***eco***fleece® Sheep's Wool 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 R-value.

Technical Literature

6.1 Refer to the Appraisal listing on the BRANZ website for details of the current Technical Literature for ***eco***fleece® Sheep's Wool 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 ***eco***fleece® Sheep's Wool Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. ***eco***fleece® Sheep's Wool Insulation can be used to meet the minimum schedule method R-values of the 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 the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.

7.2 ***eco***fleece® Sheep's Wool Insulation thermal resistance (R-value) has been determined by testing to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1.

7.3 ***eco***fleece® Sheep's Wool Insulation products are designed to be friction-fitted between wall, ceiling or roof framing. It can also be laid directly on a ceiling lining, over ceiling battens, or joists/truss chords. In other horizontal situations, the insulation must be adequately supported by a suitable durable material.

7.4 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.

7.5 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.

7.6 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.

7.7 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.

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

7.9 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturer's instruction and NZS 4246.

Durability

7.2 ***eco***fleece® Sheep's Wool Insulation meets code compliance with NZBC Clause B2.3.1 (a) 50 years where the insulation is installed in a dry, protected construction space and is difficult to access, e.g. skillion roofs.

7.2 ***eco***fleece® Sheep's Wool Insulation meets the code compliance with NZBC B2.3.1 (b), 15 years where the insulation can be accessed.

Serviceable Life

7.3 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, ***eco***fleece® Sheep's Wool Insulation can expect to have a serviceable life of at least 50 years.

Maintenance

8.1 Insulation that has become damp must be removed and the cause of dampness repaired. Cavities must be clean and dry before fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

Prevention of Fire Occurring

9.1 Separation of protection must be provided to the ***eco***fleece® Sheep's Wool Insulation from heat sources such as heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solution C/AS2, C/AS2 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources.

Downlights

9.2 Recessed luminaries shall be of type and installed in accordance with NZBC Acceptable Solutions C/AS1 or C/AS2, Section 7.4.

9.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaries in existing buildings.

Control of Internal Fire and Smoke Spread

10.1 The completed wall and ceiling system, including the surface lining product enclosing the ***eco***fleece® Sheep's Wool Insulation from the adjacent occupied space, must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solutions C/AS1 and C/AS2.

External Moisture

11.1 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.

11.2 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 manufacture.

Internal Moisture

12.1 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.

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

13.1 ***eco***fleece® Sheep's Wool 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.

13.2 ***eco***fleece® Sheep's Wool 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

14.1 Installation of ***eco***fleece® Sheep's Wool Insulation must be completed by an installer with an understanding of insulation installation.

General

15.1 Installation of ***eco***fleece® Sheep's Wool Insulation must be in accordance with the 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.

15.3 ***eco***fleece® Sheep's Wool 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 package and stored.

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

15.5 ***eco***fleece® Sheep's Wool Insulation is supplied in blanket form (Table 1) to suit framing layouts. The product is able to be cut to suit wall cavities and when fitted between roof or ceiling framing. The insulation must be neatly friction-fitted between framing members so that the potential for gaps and convective heat loss is reduced.

15.6 In wall cavities the insulation must be neatly friction-fitted between framing members to prevent sagging. In walls with a drainage cavity it must be ensured that the product does not bulge into it.

15.7 In ceiling or roofs, the insulation may be fitted between framing members or fitted over framing members and butted tightly. The insulation must extend to the external wall plate. Care must be taken to ensure a 25 mm gap between the insulation and the roof underlay is maintained.

15.8 The insulation must not be folded, tucked or compressed. A close, even fit provides the most efficient thermal performance. Whenever possible the insulation should be fitted beneath wiring or plumbing.

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

Inspections

15.10 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of ***eco***fleece® Sheep's Wool Insulation installations.

Health and Safety

16.1 Refer to the Technical Literature and NZS 4246 for guidance on health and safety requirements such as personal protective clothing and installation hazard assessment.

Basis of Appraisal

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

Tests

17.1 BRANZ has carried out thermal resistance testing of ***eco***fleece® Sheep's Wool Insulation in accordance with AS/NZS 4859.1.

Other Investigation

18.1 An assessment of the durability of ***eco***fleece® Sheep's Wool 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 ***eco***fleece® Sheep's Wool 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 Eco Insulation Systems Limited 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 remains dry is the responsibility of the building owner.

Sources of Information

- AS/NZS 4859.1: 2018 Materials for the thermal insulation of buildings.
- NZS 4246: 2016 Energy efficiency – Installing bulk thermal insulation in residential buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- BRANZ Bulletin Number 610 Preventing moisture problems in timber-framed skillion roofs.
- Ministry of Business, Innovation and Employment Record of Amendments - Acceptable Solutions, Verification Methods and Handbooks.
- The Building Regulations 1992.

BRANZ

In the opinion of BRANZ, ***eco***fleece® Sheep's Wool 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 Eco Insulation Systems 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. Eco Insulation Systems 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 Eco Insulation Systems 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 Eco Insulation Systems Ltd or any third party.

For BRANZ

Chelydra Percy
Chief Executive

Date of Issue:
9 December 2019