



**BRANZ Appraised**  
Appraisal No. 648 [2016]

## EARTHWOOL GLASSWOOL INSULATION

**Appraisal No. 648 [2016]**

This Appraisal replaces BRANZ

Appraisal No. 648 [2009]



### BRANZ Appraisals

Technical Assessments of products  
for building and construction.



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## Product

- 1.1 Earthwool glasswool insulation is a range of thermal insulating material manufactured from ECOSE Technology resin bonded glass wool fibres. The insulation is pre-cut to suit a wide range of thermal insulation requirements and framing set-outs in walls, roofs and ceilings of buildings.

## Scope

- 2.1 Earthwool glasswool 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, Earthwool glasswool 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. Earthwool glasswool insulation will meet these requirements. See Paragraph 8.1.

**Clause E3 INTERNAL MOISTURE:** Performance E3.3.1. Earthwool glasswool insulation will contribute to meeting this requirement. See Paragraphs 13.1 and 13.2.

**Clause F2 HAZARDOUS BUILDING MATERIALS:** Performance F2.3.1. Earthwool glasswool 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. Earthwool glasswool insulation will contribute to meeting this requirement. See Paragraphs 14.1 and 14.2.

## Technical Specification

4.1 Earthwool glasswool insulation is an ECOSE Technology resin bonded fibrous glass wool insulation. It is manufactured from recycled and/or virgin glass and ECOSE Technology resin and is formed into segments, blankets and rolls. Earthwool glasswool insulation is available as set out in Table 1.

**Table 1: Earthwool glasswool insulation product range**

R-value	Nominal Thickness [mm]	Length [mm]	Width [mm]	Nett Area [m <sup>2</sup> ]	Density [kg/m <sup>3</sup> ]
<b>Acoustic</b>					
1.3	50	2700	600	32.4	11.0
1.4	50	1160	430	18.9	14.0
1.4	50	1160	450	19.8	14.0
1.4	50	1160	580	25.6	14.0
1.4	50	1160	600	26.4	14.0
1.9	75	2700	600	22.7	11.0
2.0	75	1160	430	11.9	14.0
2.0	75	1160	450	12.5	14.0
2.0	75	1160	580	16.1	14.0
2.0	75	1160	600	16.7	14.0
<b>Wall Segments</b>					
2.2	90	1160	580	19.5	10.8
2.4	90	1160	580	13.4	14.5
2.6	90	1160	430	6.9	20.3
2.6	90	1160	580	9.4	20.3
2.8	90	1160	430	4.9	29.1
2.8	90	1160	580	6.7	29.1
3.2	140	1160	580	14.8	9.3
3.6	140	1160	580	10.0	13.4
4.1	140	1160	580	6.1	21.0
<b>Ceiling Segments</b>					
2.7	125	1160	430	12.0	8.8
3.2	150	1160	430	10.0	8.7
3.2^	105	1160	430	5.5	23.3
3.6	175	1160	430	10.5	7.3
3.6	175	1200	600	15.1	7.3
4.1	195	1160	430	8.9	7.7
5.2	210	1160	430	5.5	11.2
6.3	275	1160	430	5.5	9.0
<b>Ceiling Rolls</b>					
1.8	70	13,500	1200	16.2	12.1
2.9	115	8500	1200	10.2	12.2
3.2	135	8000	1200	9.6	11.0
3.6	150	7000	1200	8.4	11.0

**Table 1: Earthwool glasswool insulation product range cont...**

R-value	Nominal Thickness [mm]	Length [mm]	Width [mm]	Nett Area [m <sup>2</sup> ]	Density [kg/m <sup>3</sup> ]
<b>Handy Rolls</b>					
2.2	90	18,000	430	7.7	10.7
2.2	90	18,000	580	10.4	10.7
<b>DriTherm Masonry Wall Insulation</b>					
1.5	50	1100	600	5.3	29.5
<b>Commercial Rolls</b>					
1.4	55	37,000	1200	44.4	11.1
1.6	60	28,000	1200	33.6	13.4
1.9	75	26,000	1200	31.2	11.6
2.4	100	22,000	1200	26.4	10.2
2.6	105	18,500	1200	22.2	11.5
3.1	120	14,500	1200	17.4	13.1
3.3	130	13,500	1200	16.2	12.7

Note: ^ Skillion Roof

- 4.2 Earthwool glasswool insulation is brown in colour and is packaged in pre-printed plastic compression bags with labelling in compliance with AS/NZS 4859.1.
- 4.3 Accessories used with Earthwool glasswool insulation, which are supplied by the insulation installer, are plastic strapping and fixings.

## Handling and Storage

- 5.1 Earthwool glasswool 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 Earthwool glasswool 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 Earthwool glasswool insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Earthwool glasswool insulation can be used 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 the BRANZ House Insulation Guide. Product R-values and dimensions are given in Table 1.
- 7.2 Earthwool glasswool 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 Earthwool glasswool insulation segment, blanket and roll products are designed to be friction-fitted between wall, ceiling or roof framing. They can also be laid directly on a ceiling lining, or over ceiling battens or joist/truss chords. In other horizontal situations, the insulation must be adequately supported by a suitable durable material. Earthwool glasswool skillion roof insulation is designed to be friction-fitted between rafters.
- 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 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.
- 7.6 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.
- 7.7 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.8 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246. See Paragraphs 10.1 - 10.3.

## Durability

### Serviceable Life

- 8.1 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, Earthwool glasswool 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 fitting new insulation of an equivalent thermal rating. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.

## Prevention of Fire Occurring

- 10.1 Earthwool glasswool insulation is considered a non-combustible material and need not be separated from heat sources such as fire places, flues and chimneys. However, when used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated from fire places, heating appliances, flues and chimneys in accordance with the requirements of Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1.

### Downlights

- 10.2 Recessed luminaires shall be of a type and be installed in accordance with NZBC Acceptable Solutions C/AS1 to C/AS6, Section 7.4.
- 10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires in existing buildings.

## Control of Internal Fire and Smoke Spread

- 11.1 Earthwool glasswool insulation has been classified non-combustible when tested to AS 1530.1 and can therefore be assigned a material Group Number of 1-S. Unless foamed plastic building materials are also used as part of the wall or ceiling construction, there are no internal surface finish requirements in Risk Group SH in accordance with NZBC Acceptable Solution C/AS1, Paragraph 4.2. When used in an occupied space, Earthwool glasswool insulation does not need to be enclosed in any Risk Group. Refer to NZBC Acceptable Solutions C/AS2 to C/AS6 for the specific internal surface requirements for walls or ceilings in other Risk Groups.



### 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 Earthwool glasswool 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 - 7.7.
- 14.2 Earthwool glasswool 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 Earthwool glasswool insulation must be completed by an installer with an understanding of insulation installation.

### General

- 16.1 Installation of Earthwool glasswool 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.
- 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 Earthwool glasswool 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 Earthwool glasswool insulation is supplied in segments, blanket and roll form (Table 1) to suit framing layouts. The segment products are sized to fit between standard framing centres. 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. In wall cavities the insulation must be neatly friction-fitted between framing members to prevent sagging. In ceilings 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. 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.
- 16.5 The clearance requirements for heating appliances, 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 Earthwool glasswool insulation installations.

### Health and Safety

- 17.1 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

- 18.1 BRANZ has carried out thermal resistance testing of Earthwool glasswool insulation in accordance with AS/NZS 4859.1.
- 18.2 Tests have been carried out in accordance with AS 1530.1. Earthwool glasswool insulation is not deemed combustible according to the test criteria. The results have been reviewed by BRANZ technical experts.

### Other Investigations

- 19.1 An assessment of the durability of Earthwool glasswool 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 fibre used to manufacture Earthwool glasswool insulation is certified to the European Certification Board for Mineral Wool Products [EUCEB].

### Quality

- 20.1 The manufacture of Earthwool glasswool 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 Knauf Insulation Pty Limited 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 remains dry is the responsibility of the building owner.

### Sources of Information

- AS 1530.1: 1994 Combustibility test for materials.
- AS/NZS 4859.1: 2002 Materials for the thermal insulation of buildings.
- NZS 4214: 2006 Method of determining the total thermal resistance of parts of buildings.
- NZS 4246: 2016 Energy efficiency – Installing bulk thermal insulation in residential buildings.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- BRANZ Bulletin Number 525 Preventing moisture problems in timber-framed skillion roofs.
- Compliance Documents for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition, August 2007.
- Ministry of Business, Innovation and Employment Records of Amendments for Compliance Documents and Handbooks.
- The Building Regulations 1992.



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01 December 2016

EARTHWOOL GLASSWOOL  
INSULATION



**BRANZ**

In the opinion of BRANZ, **Earthwool glasswool 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 **Knauf Insulation Pty 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. **Knauf Insulation Pty 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.
  - 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 **Knauf Insulation Pty Limited**.
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 **Knauf Insulation Pty Limited** or any third party.

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For BRANZ

**Chelydra Percy**

Chief Executive

Date of Issue:

01 December 2016