



BRANZ Appraised

Appraisal No. 648 [2022]

KNAUF GLASSWOOL INSULATION

Appraisal No. 648 [2022]

This Appraisal replaces BRANZ Appraisal No. 648 [2016]

Amended 09 January 2023



BRANZ Appraisals

Technical Assessments of products for building and construction.



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Product

- 1.1 Knauf Glasswool Insulation is a range of thermal insulating materials manufactured from ECOSE® Technology resin-bonded, glass wool fibres and contains DriTherm® Technology which is a silicon treatment. The insulation is pre-cut to suit a range of thermal insulation requirements and framing set-outs in walls, ceilings and roofs of buildings.
- 1.2 Knauf Glasswool Insulation is a product range of Knauf Insulation and Earthwool® Glasswool Insulation and is detailed in Table 1.

Scope

- 2.1 Knauf Glasswool Insulation has been appraised as a thermal insulating 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, Knauf 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. Knauf Glasswool Insulation meets these requirements. See Paragraphs 8.1 and 8.2.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Knauf Glasswool Insulation contributes to meeting this requirement. See Paragraphs 13.1 and 13.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Knauf Glasswool Insulation meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 (a) and H1.3.2 E. Knauf Glasswool Insulation contributes to meeting these requirements. See Paragraphs 14.1 and 14.2.

Technical Specification

4.1 Knauf 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 formed into segments, blankets and rolls. Earthwool® Glasswool Insulation with DriTherm® Technology is silicon treated. Knauf Glasswool Insulation is available as set out in Table 1.

Table 1: Earthwool Glasswool and Knauf Glasswool Insulation product ranges

	R-value	Nominal Thickness [mm]	Width [mm]	Length [mm]	Density [kg/m ³]
Earthwool Glasswool Insulation	Wall Segments				
	R1.3	45	450	1160	20.5
	R2.2	90	580	1160	10.8
	R2.4	90	580	1160	14.6
	R2.6	90	430 or 580	1160	20.1
	R2.8	90	430 or 580	1160	30.7
	R4.1	140	580	1160	22.6
	R4.4	140	580	1160	36.0
	Ceiling Segments				
	R3.3	155	430	1160	7.7
	R3.6	175	430	1160	7.4
	R4.1	195	430	1160	7.8
	R5.2	210	430	1160	11.4
	R6.3	275	430	1160	9.0
	R7.0	330	460	1200	8
	R8.0	330	460	1200	11
	Skillion Roof Segments				
	R3.2	105	430	1160	26.5
	R5.0	165	430	1160	29
	R6.0	215	430	1160	17.5
	R7.4	265	430	1160	18
	Multi Use Rolls				
	2.2	90	430 or 580	18,000	10.8
Ceiling Rolls					
R3.6	150	1200	7000	11.0	
Knauf Insulation	Insulation Rolls				
	R2.4	100	1200	17500	10.2
	R3.1	120	1200	14500	12.8
	R1.9	75	1200	23000	11.6
	Smart Facade				
	R1.6	50	600	1200	38.0
	R2.3	75	600	1200	38.0
R3.1	100	600	1200	38.0	

- 4.2 Knauf 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 Earthwool Glasswool Insulation Acoustic insulation is available as set out in Table 2. *[Note: These products have not been tested to AS/NZS 4859.1.]*

Table 2: Earthwool Glasswool Insulation Acoustic insulation product range

Nominal Thickness [mm]	Width [mm]	Length [mm]	Density [kg/m ³]
50	600	2700	11.0
75	600	2700	11.0

- 4.4 Accessories used with Knauf Glasswool Insulation, which are supplied by the insulation installer, are plastic strapping and fixings.

Handling and Storage

- 5.1 Knauf 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 thermal resistance [R-value].

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Knauf 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 Knauf Glasswool Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Knauf Glasswool Insulation can be used to meet the minimum schedule method R-values of the NZBC Verification Methods H1/VM1, H1 VM2, NZBC Acceptable Solutions H1/AS1 or H1/AS2. 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 Knauf Glasswool Insulation's R-values have been determined by testing to AS/NZS 4859.1.
- 7.3 Knauf Glasswool Insulation is 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 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 For new and existing buildings, the R7.0 and R8.0 ceiling products are designed to be friction-fitted between timber framing and spill above the timber framing to form a uniform insulation layer on the top.
- 7.5 When insulation is installed in a double layer over new or existing insulation, the possibility of compression of the bottom layer must be avoided or reduction of R-values for the bottom layer of the formed system must be taken into account.
- 7.6 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.

- 7.7 Where the insulation is retrofitted in external timber-framed 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.
- 7.8 Where 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.
- 7.9 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 specifically designed skillion roof insulation products with a controlled thickness can assist with this requirement.
- 7.10 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.11 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions and NZS 4246.

Durability

- 8.1 The durability assessment of Knauf Glasswool Insulation to meet the requirements of the NZBC is based on the difficulty of access and replacement, and the ability to detect failure of the insulation, both during normal use and maintenance of the building.

Serviceable Life

- 8.2 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], Knauf 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.
- 9.2 Earthwool® Glasswool Insulation with DriTherm® Technology may be dried and retrofitted into the dried cavity if the cause of dampness was a potable water leak.

Prevention of Fire Occurring

- 10.1 Knauf Glasswool Insulation is considered a non-combustible material and need not be separated from heat sources such as fireplaces, flues and chimneys. However, when used in conjunction with or attached to heat sensitive materials, the heat sensitive material must be separated or protected from heat sources. Part 7 of NZBC Verification Method C/VM1 and Acceptable Solution C/AS1, and NZBC Acceptable Solution C/AS2 provide methods for separation and protection of combustible materials from heat sources.

Downlights

- 10.2 Recessed luminaires shall be one of the specified luminaire types and installed in accordance with NZBC Verification Method C/VM1 and NZBC Acceptable Solution C/AS1, Section 7.4.
- 10.3 Insulation materials must maintain a clearance of 100 mm to undefined recessed luminaires.

Fire Affecting Areas Beyond the Fire Source

- 11.1 Knauf Glasswool Insulation has a Group Number of 1-S. When used in an occupied space, Knauf Glasswool 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 and C/AS2 for specific internal surface finish 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 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 NZBC 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 Knauf 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 Methods H1/VM1, H1/VM2, NZBC Acceptable Solutions H1/AS1, or H1/AS2.
- 14.2 Knauf 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 Requirement

- 15.1 All design and building work must be carried out in accordance with the Knauf Glasswool Insulation Technical Literature and this Appraisal. All building work must be undertaken by competent and experienced tradespersons conversant with Knauf Glasswool Insulation.

General

- 16.1 Installation of Knauf Glasswool 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 Knauf Glasswool Insulation 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 Knauf 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 Knauf Glasswool Insulation is supplied in segments, blanket and roll form [refer to Table 1] to suit framing layouts. The segment products are sized to fit between standard framing centres. The products are 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 For new and existing buildings, the R7.0 and R8.0 ceiling products are designed to be friction-fitted between timber framing and spill above the timber framing to form a uniform insulation layer on the top.

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

Inspections

16.7 The Technical Literature, this Appraisal and NZS 4246 must be referred to during the inspection of Knauf 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 investigations carried out:

Tests

- 18.1 BRANZ has carried out assessments of thermal resistance testing of Knauf Glasswool Insulation in accordance with AS/NZS 4859.1.
- 18.2 Tests have been carried out in accordance with AS 1530.1. Knauf 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 Knauf Glasswool Insulation has been made by BRANZ technical experts.
- 19.2 The Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 19.3 The fibre used to manufacture Knauf Glasswool Insulation is certified to the European Certification Board for Mineral Wool Products [EUCEB].

Quality

- 20.1 The manufacture of Knauf 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 material remains dry is the responsibility of the building owner.

Sources of Information

- AS 1530.1:1994 Combustibility test for materials.
- AS/NZS 4859.1:2018 Thermal insulation materials for buildings.
- BRANZ Bulletin Number 610 Preventing moisture problems in timber-framed skillion roofs.
- BRANZ House Insulation Guide [Sixth Edition], 2022.
- 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.
- Ministry of Business, Innovation and Employment Record of amendments – Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.

Amendments

Amendment No. 1, dated 09 January 2023

This Appraisal has been amended to incorporate changes to Table 1 and reflect the new NZBC H1 Energy Efficiency regulations.



In the opinion of BRANZ, **Knauf 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.

For BRANZ



Chelydra Percy

Chief Executive

Date of Issue:

02 August 2022