



BRANZ Appraised
Appraisal No. 1164 [2021]

TERRA LANA UNDERFLOOR INSULATION

Appraisal No. 1164 [2021]



BRANZ Appraisals

Technical Assessments of
products for building and
construction.



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Product

- 1.1 Terra Lana Underfloor Insulation is a wool and polyester fibre blend thermal insulation for use in timber-framed floors. It is available in 70 mm and 110 mm thicknesses and is supplied in various widths to fit floor joist spacings.

Scope

- 2.1 Terra Lana Underfloor Insulation has been appraised as a thermal insulating material for suspended timber-framed floors and timber-framed mid-floors in new domestic and commercial buildings.
- 2.2 Terra Lana Underfloor Insulation is suitable for use under floors which have an enclosed perimeter foundation as defined in NZS 4246. It is also suitable for use where the subfloor area is not enclosed and is subject to wind, such as in open raised floors and pole houses.

Building Regulations

New Zealand Building Code (NZBC)

- 3.1 In the opinion of BRANZ, Terra Lana Underfloor 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] not less than 15 years, B2.3.1 [c] 5 years, and B2.3.2. Terra Lana Underfloor Insulation meets these requirements. See Paragraph 8.1 and 8.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Terra Lana Underfloor Insulation meets this requirement.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1 [a] and H1.3.2 E. Terra Lana Underfloor Insulation contributes to meeting these requirements. See Paragraphs 14.1 and 14.2.

Technical Specification

- 4.1 Terra Lana Underfloor Insulation is manufactured from polyester fibres, and recycled and new wool. The fibres are blended, carded and thermally bonded to produce segments, which are then slit to the required widths and cut to length. Standard dimensions for Terra Lana Underfloor Insulation are shown in Table 1.

Table 1: Terra Lana Underfloor Insulation Product Range¹⁾

Nominal thickness [mm]	Width [mm]	Length [mm]	Area Density [kg/m ²]
70	365 or 415 or 565	1,200	2.1
110	365 or 415 or 565	1,200	3.3

¹⁾ Refer to Paragraph 14.2 and Table 2 for construction thermal performance [R-values].

- 4.2 Terra Lana Underfloor Insulation is grey in colour and is compression packed in clear polythene bags with labelling in compliance with AS/NZS 4859.1.
- 4.3 Accessories used with Terra Lana Underfloor Insulation, which are supplied by the insulation installer, are plastic straps and galvanised staples with a 10 mm crown and an 8-10 mm leg.

Handling and Storage

- 5.1 Terra Lana Underfloor 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.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Terra Lana Underfloor 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 Terra Lana Underfloor Insulation is intended for use as thermal insulation to meet the requirements of the NZBC. Terra Lana Underfloor Insulation construction R-values are designed to meet the minimum schedule method R-values of NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1. Construction R-values are given in Table 2.
- 7.2 Terra Lana Underfloor Insulation construction R-values have been determined by a combination of testing of the products to AS/NZS 4859.1, which is an acceptable method in NZBC Acceptable Solution H1/AS1, and subsequent construction value analysis in accordance with NZS 4214.
- 7.3 Terra Lana Underfloor Insulation is designed to be installed in new domestic and commercial buildings immediately prior to sheet flooring being installed.
- 7.4 Terra Lana Underfloor Insulation is designed to be not significantly affected by wind wash in fully open subfloor situations due to the plastic strapping.
- 7.5 The building envelope must be constructed to ensure the insulation remains dry throughout the life of the building.
- 7.6 The clearance requirements for heating appliances and downlights must be met and reference made to the manufacturers instructions. Refer to Paragraphs 10.1-10.3 and 11.1.



Durability

- 8.1 Assessment of durability to meet the NZBC is based on difficulty of access and replacement, and the ability to detect failure of Terra Lana Underfloor Insulation both during normal use and maintenance of the building.

Serviceable Life

- 8.2 Where the building is maintained so that provisions of NZBC Clause E2 and E3 are met, and where the insulation is not crushed or exposed to conditions that will diminish its thermal performance (e.g. moisture), Terra Lana Underfloor Insulation can expect to have a serviceable life of at least 50 years. Support accessories must also be selected according to the required serviceable life.

Maintenance

- 9.1 Insulation that has become damp during its serviceable life must be removed and the cause of dampness repaired. NZS 4246 gives guidance on thermal insulation maintenance due to water damage.
- 9.2 Terra Lana Underfloor Insulation 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 Where the completed floor system is above an occupied space, the system, including the surface lining product enclosing Terra Lana Underfloor Insulation from the adjacent occupied space, must achieve the Group Number for internal surface finish requirements as specified in the relevant NZBC Acceptable Solution C/AS1 or C/AS2.

Downlights

- 10.2 Recessed luminaires shall be one of the specified luminaire types and installed in accordance with NZBC Verification Method C/VM1 and 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 Terra Lana Underfloor Insulation has not been assessed for use in locations where a Fire Resistance Rating (FRR) is required.

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 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.

Energy Efficiency

- 14.1 Terra Lana Underfloor Insulation will contribute to meeting the requirements of NZBC Clause H1, Performance H1.2.1 (a) and H1.3.2 E by compliance with NZBC Verification Method H1/VM1 or NZBC Acceptable Solution H1/AS1.
- 14.2 Terra Lana Underfloor Insulation construction R-values are dependent on the joist spacing and floor assembly. The floor construction R-values for the overall assembly using Terra Lana Underfloor Insulation for commonly used joist spacings are listed in Table 2.



Table 2: Floor construction R-values using Terra Lana Underfloor Insulation.

Product Thickness	Joist Spacings		
	400 mm	450 mm	600 mm
70 mm	R1.63	R1.67	R1.74
110 mm	R2.16	R2.23	R2.39

Note: The floor construction R-value assumes the floor assembly is composed of 15 mm thick plywood flooring on a 45 mm thick timber joist with the lower surface exposed to exterior air.

Installation Information

Installation Skill Level Requirements

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

General

- 16.1 Installation of Terra Lana Underfloor Insulation must be in accordance with the Technical Literature and this Appraisal.
- 16.2 The product is designed for suspended timber-framed floors and timber-framed mid-floors where the insulation is installed from above the floor joists immediately prior to sheet flooring being installed.
- 16.3 Whilst Terra Lana Underfloor Insulation tolerates water, installation shall not be conducted in rain.
- 16.4 The plastic strapping must be installed prior to the insulation for the full floor space. Details of the requirements are available in the Technical Literature.
- 16.5 Terra Lana Underfloor Insulation is supplied in segment form [see Table 1]. To ensure a tight fit of the insulation between the floor joists, the insulation must be 10 mm wider than the gap between the floor joists. Subsequent segments of insulation must be installed with no gaps and the insulation must be slightly compressed against the previous installed segment to ensure a snug fit to not compromise on the thermal performance. Care during installation is important to avoid gaps that can create heat loss.
- 16.6 Sheet flooring must be installed within 24 hours of insulation installation.
- 16.7 Plumbing will be installed after the insulation has been installed. No minimum gap is required to be maintained between Terra Lana Underfloor Insulation and plumbing or pipe work fittings.
- 16.8 The clearance requirements for heating appliances and downlights must be followed as detailed in Paragraphs 10.2-10.3.

Inspections

- 16.9 The Technical Literature and this Appraisal must be referred to during the inspection of Terra Lana Underfloor Insulation installations.

Health and Safety

- 17.1 The Technical Literature and NZS 4246 give 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 Terra Lana Underfloor Insulation in accordance with AS/NZS 4859.1.

Other Investigations

- 19.1 An assessment of the construction R-values has been made by Sustainable Engineering Ltd. The report as been reviewed by BRANZ and found to be satisfactory.
- 19.2 An assessment of the durability of Terra Lana Underfloor Insulation has been made by BRANZ technical experts.
- 19.3 The manufacturer's Technical Literature has been reviewed by BRANZ and found to be satisfactory.
- 19.4 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality

- 20.1 The manufacture of Terra Lana Underfloor 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 Site inspections have been undertaken by BRANZ to assess the practicability of installation.
- 20.3 Terra Lana Products Ltd is responsible for the quality of the product supplied.
- 20.4 Quality of installation of the product on-site is the responsibility of the installer.
- 20.5 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 4859.1:2018 Thermal insulation material for buildings - Part 1: General criteria and technical provisions.
- BRANZ House Insulation Guide, Fifth Edition 2014.
- NZS 4214:2006 Methods of determining the total thermal resistance of parts of buildings.
- NZS 4246:2016 Energy efficiency - Installing bulk insulation in residential buildings.
- Ministry of Business, Innovation and Employment Record of amendments - Acceptable Solutions, Verification Methods and handbooks.
- The Building Regulations 1992.



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TERRA LANA UNDERFLOOR
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In the opinion of BRANZ, **Terra Lana Underfloor 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 **Terra Lana Products 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. **Terra Lana Products 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 **Terra Lana Products 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 **Terra Lana Products Ltd** or any third party.

For BRANZ

Chelydra Percy

Chief Executive

Date of Issue:

07 July 2021