BRANZ Appraised
Appraisal No.825 [2013]

BRANZ Appraisals

Technical Assessments of products for building and construction

BRANZ APPRAISAL No. 825 (2013)

TECHNOBOND POLYESTER UNDERFLOOR INSULATION

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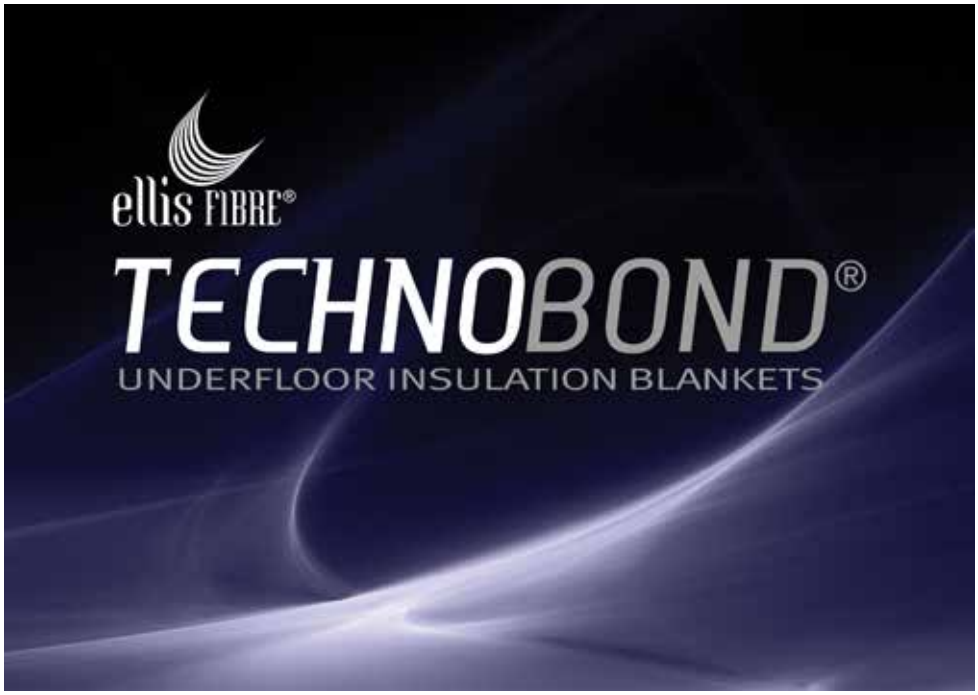
WFTAO

Product

1.1 Technobond Polyester Underfloor Insulation is a low density polyester insulation blanket used as a thermal insulation material for under floors. It is available in three R-values, R1.6, R1.8 and R2.0 and is supplied in rolls in a range of widths.



Scope

2.1 Technobond Polyester Underfloor Insulation has been appraised as an underfloor insulation designed to meet the NZBC Acceptable Solution H1/AS1 requirement for the insulation of underfloors within the following scope:

- timber framed floors in new and existing domestic and commercial buildings with a closed perimeter or lined; and,
- installed in buildings where the insulation remains dry during its serviceable life.

2.2 Technobond Polyester Underfloor Insulation must be installed in accordance with the Technical Literature to meet the building code requirement for the insulation of underfloors. See Paragraph 6.1.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Technobond Polyester 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(a) not less than 50 years and B2.3.1(b) 15 years. Technobond Polyester Underfloor Insulation meets these requirements. See Paragraphs 8.1- 8.3.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Technobond Polyester Underfloor 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. Technobond Polyester Underfloor Insulation will contribute to meeting these requirements. See Paragraphs 14.1 – 14.8.

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. The thermal resistance (R-value) of the Technobond Polyester Underfloor Insulation material has been determined by testing to AS/NZS 4859.1, which is an acceptable method.

Technical Specification

4.1 Technobond Polyester Underfloor Insulation is manufactured from non-woven thermally bonded polyester fibres. The fibres are blended, carded and thermally bonded to produce blankets, which are machine slit to required widths and cut to length. The blankets are then packed into compression packed plastic bags.

4.2 Technobond Polyester Underfloor Insulation is available as set out in Table 1 and each packet is supplied with labelling in compliance with AS/NZS 4859.1.

4.3 Accessories used with Technobond Polyester Underfloor Insulation which are supplied by the installer are:

- Zinc plated and stainless steel staples that meet the requirements of NZBC Clause B2 Durability: Performance B2.3.1 (b) 15 years.

Table 1: Technobond Polyester Underfloor Insulation Product Range

Product		Size (mm)	Thickness (mm)	Rolls	Density (kg/m^3)	Area (m^2)	Net weight (kg)
Technobond Polyester Underfloor Insulation	R1.6	450 x 10,000	100	4	8.4	18.0	15.2
		500 x 10,000	100	3	8.4	15.0	12.6
		580 x 10,000	100	3	8.4	17.4	14.6
	R1.8	450 x 10,000	100	4	11	18.0	19.8
		500 x 10,000	100	3	11	15.0	16.5
		580 x 10,000	100	3	11	17.4	19.1
	R2.0	450 x 10,000	110	4	12.7	18.0	25.2
		500 x 10,000	110	3	12.7	15.0	21.0
		580 x 10,000	110	3	12.7	17.4	24.4

Handling and Storage

5.1 Technobond Polyester 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 Compression packaged polyester insulation can be subjected to a maximum combination of compression density and storage time, after which the product may not loft to its nominal thickness and therefore may not achieve its designed thermal performance.

Technical Literature

6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Technobond Polyester 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 Technobond Polyester Underfloor Insulation is designed to be used as thermal insulation to meet the insulation energy efficiency requirements of NZBC H1/AS1, or to provide greater ratings when required by the designer, when installed in buildings as underfloor insulation. BRANZ Bulletin 522 provides guidance on NZBC Clause H1 compliance options.

7.2 The material R-values of R1.6, R1.8 and R2.0 m^2^{o}C/W are designed so that the floor system meets or exceeds the minimum requirements of R1.3 of NZS 4218 and NZBC Acceptable Solution H1/AS1 (excluding heated floors).

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

7.4 Technobond Polyester Underfloor Insulation is intended to be retrofitted between joists and stapled in place. Fixing centres vary with the joist centres and the manufacturers instructions must be followed.

7.5 Where the subfloor is not enclosed by a perimeter foundation such as a solid concrete masonry ring foundation or where the subfloor is not enclosed with a sheet material the Insulation must be protected from wind wash by a suitable lining material.

7.6 NZS 4246 requires a minimum separation of 50 mm from metal chimneys and flues where they penetrate the insulation. These clearances must be taken into account in the assessment of compliance with NZBC Clause H1 Energy Efficiency.

7.7 When installing underfloor insulation, the moisture emission from the ground must be considered and NZS 4246 provides guidance.

Durability

8.1 Technobond Polyester Underfloor Insulation meets code compliance with NZBC Clause B2.3.1 (a), 50 years where the insulation is difficult to access, e.g. sub floors with linings.

8.2 Technobond Polyester Underfloor Insulation meets code compliance with NZBC Clause B2.3.1 (b), 15 years where the insulation can be accessed, e.g. suspended sub floors without lining.

Serviceable Life

8.3 Where the building is maintained so that the provisions of NZBC Clause E2 and E3 are met and the insulation is not crushed or exposed to conditions that will diminish its thermal performance (e.g. moisture), Technobond Polyester Underfloor Insulation is expected to have a serviceable life of at least 50 years.

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 new insulation of an equivalent thermal rating should be installed. Floor construction must be clean, dry and free of all contaminants and mould before refitting insulation. NZS 4246 Paragraph 3.3, gives guidance on thermal insulation maintenance due to water damage.

9.2 As part of routine property maintenance the underfloor insulation should be inspected to ensure that the installation quality is maintained.

Prevention of Fire Occurring

10.1 Separation or protection must be provided to Technobond Polyester Underfloor Insulation from heat sources such as fire places, heating appliances, flues and chimneys. Part 7 of NZBC Acceptable Solutions C/AS1 to C/AS6 and NZBC Verification Method C/VM1 provide methods for separation and protection of combustible materials from heat sources. See Paragraph 7.6.

Control of Internal Fire and Smoke Spread

11.1 Where the completed floor system is above an occupied space, the system, including the ceiling lining and finish, must achieve the group number specified in the relevant NZBC Acceptable Solutions C/AS1 to C/AS6.

External Moisture

12.1 The total building envelope must 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 a lower moisture content if required by the flooring manufacturer.

Internal Moisture

13.1 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.

Energy Efficiency

Building Thermal Envelope

14.1 NZBC Verification Method H1/VM1 can be used for Housing, Communal Residential, Communal Non-residential and Commercial buildings.

Modelling of Housing and Smaller Buildings

14.2 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:

a) 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,
b) Small buildings other than housing having a net lettable area no greater than 300 m^2.

Building Performance Index for Housing

14.3 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

14.4 The modelling method described in NZS 4243 Parts 1 and 2 is a Verification Method for NZBC Clause H1.3.1 (a) for buildings other than Housing having a net lettable area greater than 300 m^2.

Determining Thermal Resistance

14.5 The thermal resistance (R-values) of building elements may be verified by using NZS 4214. The BRANZ 'House Insulation Guide' Fourth Edition provides thermal resistances of common building elements and is based on calculations using NZS 4214 as a guide. When calculating the system R-value, the R-value of the insulation material should be based on the average thickness of the material after installation including any compression of the edges due to the fixings. AS/NZS 4859.1 Section 3.1 provides guidance.

Building Thermal Envelope

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

Housing and Small Buildings

14.7 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 m^2.

14.8 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.

Installation Information

Installation Skill Level Requirements

15.1 Installation of Technobond Polyester Underfloor Insulation must be completed by an installer with an understanding of insulation installation.

General

16.1 Installation of Technobond Polyester Underfloor Insulation must be in accordance with the manufacturer's Technical Literature and this Appraisal. NZS 4246 should be used as a guide for installing insulation in residential buildings.

16.2 Technobond Polyester Underfloor Insulation must be installed only when the building subfloor is weatherproof and when the construction materials have achieved the required maximum moisture content or less, to ensure the insulation does not become wet.

16.3 Technobond Polyester Underfloor Insulation must be released from the packaging and allowed to re-loft to the specified nominal thickness prior to installation. The time to loft will depend upon the length of time the product has been packaged and stored.
16.4 Technobond Polyester Underfloor Insulation is designed to be wider than the joist cavity and excess material should be folded down on each side and stapled at approximately 75 mm from the top of the floor joist for the R1.6 and R1.8 and approximately 85 mm from the top of the floor joist for the R2.0 product and then along the length of the roll at intervals of 150 mm for 580 mm wide product, 200 mm for 500 mm wide product and 300 mm for 480 mm wide product.
16.5 Where floors are lined, the manufacturer's Technical Literature must be followed.
16.6 Technobond Polyester Underfloor Insulation must be installed hard against the floor, ends neatly butted and the ends of joist runs sealed off to minimise any convection heat loss.
16.7 Where possible, insulation should be installed above electrical wiring. Extreme caution must be taken to ensure that no fixings can penetrate electrical cables or conduits.
16.8 Technobond Polyester Underfloor Insulation must be neatly cut to allow 100 mm clearance around plumbing pipework.

Inspections
17.1 The Technical Literature and NZS 4246 must be referred to during inspection of Technobond Polyester Underfloor Insulation installations.

Health and Safety
18.1 Technobond Polyester Underfloor Insulation is easy to handle. However, due to the conditions under a house, it is recommended that safety glasses and a dust mask be worn when installing underfloor insulation.
18.2 Electrical safety assessments must be completed to identify any electrical hazards.
18.3 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
19.1 BRANZ has carried out thermal resistance testing of Technobond Polyester Underfloor Insulation material in accordance with the testing methods of AS/NZS 4859.1.

Other Investigations
20.1 An assessment of the durability of Technobond Polyester Underfloor Insulation has been made by BRANZ technical experts.
20.2 The manufacturer's Technical Literature has been reviewed by BRANZ and found to be satisfactory.
20.3 Site inspections have been undertaken by BRANZ to assess the practicability of installation.

Quality
21.1 The manufacture of Technobond Polyester 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.
21.2 Ellis Fibre Ltd is responsible for the quality of the product supplied.
21.3 Quality of installation of the product on site is the responsibility of the installer.
21.4 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.

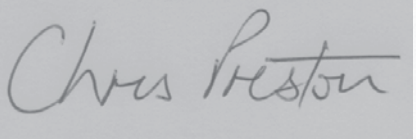
Sources of Information
- AS/NZS 4859.1: 2002 including Amendment 1: 2006 Materials for the thermal insulation of buildings.
- BRANZ Bulletin No. 522, H1 Compliance Options, April 2010.
- BRANZ House Insulation Guide, Fourth Edition 2010.
- NZS 4218: 2004 Energy efficiency – Housing and small building envelope.
- NZS 4243: 2007 Parts 1 and 2 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.
- Ministry of Business, Innovation and Employment Record of Amendments for Compliance Documents and Handbooks.
- The New Zealand Building Regulations 1992.

In the opinion of BRANZ, Technobond Polyester 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 Ellis Fibre 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. Ellis Fibre 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 Ellis Fibre 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 Ellis Fibre Ltd or any third party.

For BRANZ



C Preston
Chief Executive

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