



BRANZ Appraised

Appraisal No.693 [2010]

BRANZ Appraisals

Technical Assessments of products
for building and construction

**BRANZ
APPRAISAL
No. 693 (2010)**

**TECHNOBOND
POLYESTER THERMAL
INSULATION**

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Product

1.1 Technobond is a range of polyester fibre insulation used as thermal and acoustic insulating material in ceilings, roofs and walls of buildings.



Scope

2.1 Technobond Polyester Insulation has been appraised as a thermal insulation material for ceilings, roofs and walls of buildings within the following scope:

- framed or part-framed domestic and commercial buildings where the insulation remains dry during its serviceable life.

2.2 Technobond must be installed in accordance with the relevant requirements of NZS 4246, the manufacturers Technical Literature and this Appraisal to meet the stated thermal performance rating of the insulation.

Building Regulations

New Zealand Building Code (NZBC)

3.1 In the opinion of BRANZ, Technobond Polyester Thermal 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 Thermal Insulation will meet these requirements. See Paragraph 8.1.

Clause E3 INTERNAL MOISTURE: Performance E3.3.1. Technobond Polyester Thermal Insulation will contribute to meeting this requirement. See Paragraphs 12.1 and 12.2.

Clause F2 HAZARDOUS BUILDING MATERIALS: Performance F2.3.1. Technobond Polyester Thermal Insulation meets this requirement and will not present a health hazard to people.

Clause H1 ENERGY EFFICIENCY: Performance H1.3.1(a) and H1.3.2E. Technobond Polyester Thermal Insulation will contribute to meeting these requirements. See Paragraphs 13.1 to 13.8

3.2 This is an Appraisal of an **Acceptable Solution** in terms of New Zealand Building Code compliance. Technobond Insulation's thermal resistance (R-Value) has been determined by AS/NZS 4859.1 which is an acceptable method.

Technical Specification

- 4.1 Technobond Polyester 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 the required width and cut to length. The blankets are then compression packed into plastic bags.
- 4.2 Technobond Insulation is lavender in colour and is packaged in double layer clear compression tube packaging.
- 4.3 Each packet is supplied with labelling in compliance with AS/NZS 4859.1.
- 4.4 The product is available as set out in Table 1.

Table 1: Product Range

Product Type	Length (mm)	Width (mm)	Thickness (mm)	Blankets per pack	Weight of Pack (Kg)	Total Area per pack (m ²)
R2.6	9000	580	140	3	24.3	15.66
R2.6	9000	870	140	2	24.3	15.66
R3.2	9000	580	170	3	27.4	15.66
R3.2	9000	870	170	2	27.4	15.66

- 4.5 The standard 580 mm width is designed for use with framing set out at nominal 600 mm centres. The material is also supplied at a width of 870 mm for use between framing set out at nominal 900 mm centres.
- 4.6 Blankets can also be pre-cut to custom widths for large orders. Blanket packaging may vary with width. Blanket length remains at 9 m for all widths.
- 4.7 Technobond R3.2 cannot be used within enclosed cavities less than 170 mm in depth, and R2.6 cannot be used within enclosed cavities less than 140 mm in depth.
- 4.8 Plastic strapping and associated fixings supplied and used by the insulation installer to control the insulation material from movement that would affect the thermal or acoustic insulation performance, must meet NZBC Clause B2 Durability performance requirement B2.3.1(a) 50 years for components that are enclosed and not accessible, and performance requirement B2.3.1(b) 15 years, for components that are accessible and can be inspected and replaced.

Handling and Storage

- 5.1 Technobond 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. The longer they are stored, the longer it will take for them to recover to their natural loft after unpacking.
- 5.3 Although the recovery is accelerated by warmer temperatures above 35°C, Technobond may not recover its full loft, and therefore its full R-value, if it is stored for more than 6 months in its compression pack.

Technical Literature

- 6.1 Refer to the Appraisals listing on the BRANZ website for details of the current Technical Literature for Technobond. 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 Insulation is designed to be used as thermal insulation to meet energy efficiency and other NZBC insulation requirements, and can provide greater ratings when required by the designer, when installed in building ceilings, roofs, and walls.
- 7.2 The building envelope must be constructed to ensure the insulation remains dry during installation and throughout the life of the building.
- 7.3 To minimise the risk of moisture transfer to the insulation, roofs must be constructed to maintain a minimum airspace of 25 mm between the insulation and the roofing underlay or other roof elements, except where a solid substrate is used under the roof cladding material. (Note: some roofing may still require ventilation clearance.)
- 7.4 The clearances specified in the installation instructions, or specified by the manufacturer of heating appliances and recessed light fittings must be met. The use of recessed light fittings may therefore reduce the thermal performance of insulated ceilings. This factor must be taken into account in the assessment of compliance with NZBC Clause H1 Energy Efficiency.
- 7.5 Where the insulation material is not laid directly on a ceiling lining or over ceiling battens or joists, it must be adequately supported by galvanised wire netting or some other suitable corrosion resistant material. This applies to commercial buildings.
- 7.6 When the insulation is installed in a wall with a drained cavity 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 Where the insulation is installed in exterior walls, the insulation material nominal thickness is to be selected to provide a snug close fit of the insulation between the building wrap and the interior wall lining.

Durability

Serviceable Life

- 8.1 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), and where the material is accessible then Technobond can expect to have a serviceable life of at least 15 years. Technobond can also expect to have a serviceable life of 50 years when installed in dry, non-accessible enclosed construction cavities.

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 then replaced with new insulation of an equivalent thermal rating. Cavities must be clean, dry and free of all contaminants and mould before fitting new insulation. NZS 4246 Paragraph 3.3 gives guidance on thermal insulation maintenance due to water damage.

Outbreak of Fire

10.1 Technobond must be separated or protected from sources of heat such as chimneys, fireplaces, flues and fuel burning appliances in accordance with the requirements of NZBC Acceptable Solution C/AS1 Part 9.

External Moisture

11.1 The total building envelope must comply with the requirements of NZBC E2 to ensure that the insulation remains dry in use.

11.2 The moisture content of the construction materials at the time of enclosing the insulation must meet the requirements of NZBC Acceptable Solution E2/AS1, or lower moisture content if required by the lining manufacturer.

Internal Moisture

12.1 Buildings other than communal non-residential, commercial, industrial, outbuildings or ancillary buildings, must be constructed so that all habitable spaces, bathrooms, laundries and other spaces where moisture may be generated or may accumulate, have an adequate combination of thermal resistance, ventilation, and internal space temperature control.

12.2 Roofs and walls of housing complying with the Schedule Method for Compliance with Clause H1.3.2E will have adequate thermal resistance. Other buildings may require more thermal insulation to satisfy the requirements of NZBC E3/AS1 than that used to satisfy the energy efficiency provisions alone.

Energy Efficiency

Building Thermal Envelope

13.1 NZBC Verification Method H1/VM1 can be used for housing, communal residential, communal non-residential and commercial buildings.

Modelling of Housing and Smaller Buildings

13.2 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 H1.3.2E, which applies only to housing; and,
- b) Small buildings other than housing having a net lettable area no greater than 300 m².

Building Performance Index for Housing

13.3 Compliance with NZBC Clause H1.3.2E Building Performance Index (BPI) satisfies Clause H1.3.1(a).

Modelling of Large Buildings Other Than Housing

13.4 The modelling method described in NZS 4243.1 Section 4.4 is a Verification Method for NZBC Clause H1.3.1(a) for buildings other than Housing having a net lettable area greater than 300 m².

Determining Thermal Resistance

13.5 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 from NZS 4214.

Building Thermal Envelope

13.6 NZBC Acceptable Solution H1/AS1 can be used for housing, communal residential, communal non-residential and commercial buildings.

Housing and Small Buildings

13.7 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 m².

13.8 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 H1.3.2E for housing of any size, including the external walls of multi-unit dwellings. (Note that common walls between household units of multi-unit dwellings need not comply with NZS 4218.)

Installation Information

Installation Skill Level Requirements

14.1 Installation of Technobond must be completed by installers with an understanding of insulation installation in accordance with the instructions given within NZS 4246, the Technobond Technical Literature, installation instructions and this Appraisal.

General

15.1 Installation of Technobond must be in accordance with the manufacturer's Technical Literature, installation instructions and this Appraisal. Installation must be carried out by installers with a good understanding and experience of insulation practice. 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, to ensure the insulation does not become wet.

15.3 After release from its packaging, and its installation, Technobond will require some time to fully re-loft. The time taken to completely re-loft will depend upon the length of time the product has been packaged and stored and the ambient temperature.

15.4 Technobond is manufactured in roll sizes designed to suit ceiling framing (See Table 1). Standard blanket widths available are 580 mm or 870 mm for use with 600 mm or 900 mm framing centres respectively. Custom roll widths can also be made to special order if required. Blanket roll length remains at 9 metres for all widths.

15.5 Other cavity sizes, for example 400 mm or 450 mm in walls, can be filled using Technobond blanket but it must be accurately cut to the width required.

15.6 Where Technobond is cut to fit wall cavities, the insulation must be friction fitted into the timber framework to completely fill the cavity. This will prevent sagging over time and thermal convection within the cavity.

15.7 The insulation can also be fitted over the top of framing members but must be butted tightly from one insulation section to the next so that the potential for gaps and convective heat loss is reduced. The material must not be folded, tucked or compressed. A close, even fit provides the most efficient thermal performance.

15.8 The insulation must be continuous across the entire roof or ceiling plane between top plates of external walls, and fitted either between or over rafters, ceiling joists or truss chords. Wherever possible the insulation should be fitted beneath wiring or plumbing.

15.9 Where recessed lights are present in insulated walls or ceilings, the thermal performance of the insulated space may be reduced, and/or the overheating risk to surrounding materials may be increased. Only a specific category of marked lights (F HAT – requiring independent verification) can be covered with insulation. Others require a minimum clearance between the recessed light and insulation, as specified in NZS 4246 for lamps up to and including 100 Watts, which must be maintained unless the manufacturer of the recessed light can verify a lesser clearance is appropriate. For recessed lights designed for use with lamps exceeding 100 Watts, larger clearances may be required and the manufacturer's instructions must be followed. Compensation for the loss of insulation due to clearance required around recessed lights must be made to meet the requirements of NZBC Clause H1.

Inspections

16.1 The Technical Literature must be referred to during the inspection of Technobond installations.

Health and Safety

17.1 Technobond is easy to handle. However, it is recommended that a dust mask be worn when handling the product as loose fibres and dust can be disturbed.

Sources of Information

- AS/NZS 4859.1: 2002 including Amendment 1: 2006 Materials for the thermal insulation of buildings.
- BRANZ House Insulation Guide, Fourth Edition 2010.
- NZS 4218: 2004 Energy efficiency – housing and small building envelope.
- NZS 4243: 1996 Energy efficiency – large buildings.
- NZS 4246: 2006 Energy efficiency – Installing Insulation In Residential Buildings
- Compliance Document for New Zealand Building Code External Moisture Clause E2, Department of Building and Housing, Third Edition, July 2005.
- Compliance Document for New Zealand Building Code Energy Efficiency Clause H1, Department of Building and Housing, Third Edition, August 2007.
- New Zealand Building Code Handbook Department of Building and Housing, Third Edition May 2007.
- The Building Regulations 1992, up to, and including August 2008 Amendment.

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 Technobond in accordance with AS/NZS 4859.1: 2002 including Amendment 1: 2006.

Other Investigations

19.1 An assessment of the durability of Technobond has been made by BRANZ technical experts.

19.2 The Ellis Fibre Ltd Technical Literature and installation instructions have been reviewed by BRANZ and found to be satisfactory.

Quality

20.1 The manufacture of Technobond has been examined by BRANZ, including methods adopted for quality control. Details of the manufacturing processes, production quality and composition of the raw materials used were obtained and found to be satisfactory.

20.2 Ellis Fibre Ltd is responsible for the quality of the product supplied.

20.3 Quality of installation of the product on site is the responsibility of the insulation installer.

20.4 Quality of maintenance of the building to ensure the insulation material remains dry is the responsibility of the building owner.



BRANZ

In the opinion of BRANZ, **Technobond Polyester Thermal 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

P Burghout
Chief Executive

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