BEAL Appraisal Certificate

APPRAISAL #CA602

EXPIRY DATE: 30 April 2026

ThermaX B® - a Thermal Break for Use on Steel Framing

Product

1.1 ThermaX B® is an Acceptable Solution in terms of the NZBC used as a thermal break for steel stud framed walls and roof trusses. Maintaining the thermal performance of a steel framing system in buildings is essential for demonstrating compliance with Clause H1 of the New Zealand Building Code.

1.2 This requirement especially applies to any part of a steel-framed building that provides living spaces as part of the building's use, such as with farm buildings and the like. Maintaining a clear pathway for moisture and air movement is also essential for the proper functioning of a cavity behind the rain screen of a cladding system.

1.3 ThermaX B® is used to prevent 'thermal bridges' between highly conductive external cladding systems and the steel framing. A thermal bridge is a physical pathway along which heat can travel from inside the building to the outside.

NZ Building Regulations

2.1 In the opinion of BEAL, the Thermax B® thermal break, when designed, installed and maintained in accordance with the statements and conditions of this Appraisal Certificate, will meet or contribute to the following provisions of the NZBC.

Clause B2 – Durability

ThermaX B®, when used in accordance with this appraisal, will meet Performance B2.3.1(a) of the New Zealand Building Code. In other words, the product as appraised will be durable for the life of the building.

Clause E3 – Internal Moisture

ThermaX B® contributes to the performance requirement of clause E3.3.1 of the Building Code. In other words, the product will contribute to the provision of 'an adequate combination of thermal resistance and ventilation… to all habitable spaces… and other spaces where moisture could be generated.'

Clause F2 – Hazardous Building Materials

ThermaX B® contains no hazardous materials and is compliant with clause F2.3.2 of the Building Code.

Clause H1 – Energy Efficiency

ThermaX B® contributes to a building meeting the requirement of clause H1.3.2E.

2.2 The Thermax B® thermal break has been appraised as an 'Alternative Solution' in terms of the of the New Zealand Building Code.

Applicant:

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Scope and Limitations

3.1 ThermaX B® has been specifically designed to act as a thermal break to prevent thermal bridging between thermally conductive cladding products and steel framing and has been appraised as meeting the performance requirements of E3.3.1.

3.2 For ThermaX B® to be an effective thermal break, fixings used to attach the product to the framing must not be over-tightened.

Technical Literature

4.1 The installation of ThermaX B® is described in the ThermaX B® Data Sheet Version 4.3 ref:TB000172 which must be followed to ensure compliance with the Building Code.

Technical Details

5.1 The product comprises of nominally 42 mm wide strips of high-density extruded polystyrene (HD-XPS) cut to the required length to match the height of the steel stud and dwangs for typical housing construction. For light commercial/ commercial applications, the width will need to be ordered to suit the width of the steel stud or dwang. ThermaX B® is available in 10mm, 15mm, 20mm and 50mm thicknesses. Based on a thermal conductivity at 15°C their R-values are 0.36, 0.54, 0.72 and 1.79.

Handling and Storage

5.2 ThermaX B® can be stored indefinitely when kept dry and out of the weather. Do not place objects heavier than 5kg directly on top of stored material. Keep storage away from direct heat sources and temperatures greater than 28 degrees celsius.

Advice for Designers

6.1 The product comprises of nominally 42 mm wide strips of high-density extruded polystyrene (HD-XPS) cut to the required length to match the height of the steel stud and dwangs for typical LGS construction. For light commercial/ commercial applications, the width will need to be ordered to suit the width of the steel stud or dwang. ThermaX B® is available in various thicknesses: 10mm, 15mm, and 20mm.

Based on the material having a thermal conductivity rating of 0.027 kcal/m.hr°C at a mean tested temperature of 15°C as per NZS4214:
10mm will have an R-value of 0.36
15mm will have an R-value of 0.54
20mm will have an R-value of 0.72
50mm will have an R-value of 1.79

In the BRANZ Feb/Mar 2009 *Build* magazine, under 'Thermal Breaks and Bridges', it is stated that thermal break material must have an R-value of at least R0.30. Based on this expert opinion, ThermaX B® 10mm strips exceed this requirement.
HD-XPS has a compressive strength three times that of expanded polystyrene (EPS), resulting in a stiff, difficult to compress material.
The product is impervious to water and nearly impervious to moisture vapour.
The product is of very low density, being about one-ninth that of typical dry pinus radiata.
The product has a low co-efficient of expansion and low fire ignitability index, making it suitable as a thermal break.

Durability – Clause B2

6.2 To assess the durability of ThermaX B®, historic information about the durability performance of extruded polystyrene (XPS) was referred to. ThermaX B® is manufactured from HD-XPS. Although extruded polystyrene was invented in the late 1930s, it has only been available for use since 1954. The performance over the past fifty years has shown that the product is resistant to most environmental effects and is well suited as an insulating material for buildings.

Internal Moisture – Clause E3

- 6.3 ThermaX B® has the ability to contribute to meeting the requirement of Performance Clause E3.3.1 of the New Zealand Building CodeGeneral ease of use.

In the opinion of BEAL, the results of the assessments confirm that the ThermaX B® will contribute to the requirement of Clauses E3 (Internal Moisture) and H1 (Energy Efficiency) of the Building Code in a steel-framed wall or roof assembly when installed according to the conditions of this Appraisal Certificate.

Hazardous Building Materials – Clause F2

6.4 ThermaX B® is manufactured from non-toxic materials and poses no threat to human health.

Installation Requirements

Installation Skill Level Requirement

7.1 ThermaX B® can be installed by any competent tradesperson using the appropriate tools and equipment. The ThermaX B® Data Sheet Version 1 ref:TB000172 (dated January 2006) must be followed to ensure compliance with the Building Code.

System Installation

7.2 The product must be installed as described in the ThermaX B® Data Sheet Version 4.3 ref:TB000172 (dated April 2025). The product is placed over studs, top and bottom plates, dwangs and any point where the framing penetrates the insulation and can be glue-fixed or screw-fixed or attached using Polysafe Spray Adhesive supplied by Insulation Wholesalers Ltd. The wall wrap is then laid over the thermal break before the cladding is installed.

Design Considerations

7.3 The following conditions must be observed:

- ThermaX B® may be fixed to the steel stud using either a wafer self-tapping screw or an approved adhesive such as Polysafe Spray, which is available from Insulation Wholesalers Ltd.
- ThermaX B® is not designed to provide support to any structural member attached to the steel framing.
- Care must be taken to not over-tighten the screws used to fix the sheet cladding to the steel framing; this is especially the case with corrugated metal sheeting. The drill clutch must be set to avoid over-tightening of the screws.
- ThermaX B® must not be allowed to come into contact with any material that could exceed a temperature of 80° C.
- Screws used to fix metal sheet cladding must have rubber type washers to minimise heat loss and provide weathertightness.

Note:
When specifying these products, the product name should be accompanied by the BEAL appraisal number. E.g. *ThermaX B®: BEAL Appraisal CA602.*

Health and Safety

7.4 The ThermaX B® thermal break presents no known health and safety issues when installed according to the instructions in the technical manual. Refer to the Material Safety Data Sheet (MSDS).

Basis of this Appraisal

8.1 This product has been assessed as an 'Alternative Solution'. Verification of compliance was based on:

- In-service history for demonstrating compliance with clause B2.3.1(b),and
- A compression test for demonstrating durability over time under compression
- A review of the installation drawings to assess how the product contributes to clause E3.3.1
- An opinion from BEAL covering the non-hazardous nature of the XPS material as required by clause F2.3.1
- A thermal test report with calculation to determine the R-values at different thicknesses in accordance with Verification Method H1/VM1
- Assessments of site installation conditions including:

⇒ The width and thickness of the product
⇒ The product's ability to be fixed directly to steel framing
⇒ Stiffness
⇒ Resistance to compression when a corrugated sheet was screw fixed to the steel framing

Durability - Clause B2

8.1 For assessing the durability of ThermaX B®, historic information about the durability performance of 'extruded polystyrene' (or XPS) was referred to. ThermaX B® is manufactured from HD-XPS. Though extruded polystyrene was invented in the late 30's, it has only been available for use since 1954. The performance over the past fifty years has shown that the product is resistant to most environmental effects and is well suited as an insulating material for buildings.

Internal Moisture - Clause E3

8.2 For assessing the ability for ThermaX B® to contribute to meeting the requirement of Clause E3 of the New Zealand Building Code, an opinion from experts at BEAL were obtained to confirm that the ThermaX B® will contribute to the requirement of Clauses E3 (Internal Moisture) and H1 (Energy Efficiency) of the Building Code in a steel framed wall assembly when installed according to the conditions of this BEAL Appraisal.

Hazardous Building Materials - Clause F2

8.3 ThermaX B® is manufactured from non toxic materials

Contribution to Thermal Performance - Clause H1

8.4 Testing has been completed in accordance with Verification method H1/VM1

This appraisal uses the historical use of the base material, the trade literature supplied by the manufacturer, together with the assessments carried out by the Building Element Assessment Laboratory Ltd. (BEAL), as the 'methods' for demonstrating compliance with the relevant clauses of the Building Code.

[Methods suggested by MBIE - refer www.building.govt.nz]

Sources of Information

- New Zealand Building Code – Clause H1 Energy Efficiency
- Acceptable Solutions E3/AS1
- NZS 4214(INT):2002 Methods of determining the total thermal resistance of parts of buildings
- NZS 4218:2004 Energy Efficiency – Small Building Envelope
- HERA Report R4-72 Thermal Insulation Performance of Light-Weight Steel External Wall Elements
- BRANZ Bulletin Number 572, June 2014
- Web-based documents giving a historic background to the origin, manufacture and durability of extruded polystyrene (XPS)
- TR230606: A measurement of the thermal conductivity of Extruded Polystyrene Foam (XPS) Boards
- TR180508-2 :A proprietary test method for assessment of the flatwise compression strength of the Thermax B
- A durability opinion from BEAL
- Technical and trade literature provided by the manufacturer.

Concluding statement

9.1 In the opinion of BEAL, the ThermaX B® thermal break is fit for purpose and will comply with the NZBC to the extent specified provided that it is used, designed, installed and maintained as set out in this Appraisal Certificate and the ThermaX B® technical literature.

9.2 The Appraisal Certificate is issued only to Insulation Wholesalers Ltd. and is valid until further notification subject to the conditions of this Appraisal.

Conditions of Appraisal

10.1 This Appraisal Certificate :

a) Relates only to the ThermaX B® thermal break system as described herein;
b) Must be read, considered and used in full, together with the current version of the ThermaX B® technical literature;
c) Does not address any legislation, regulations, codes or standards, not specifically named herein;
d) Is copyright of BEAL.

10.2 The Appraisal Certificate holder continues to meet the quality requirements of the Insulation Wholesalers Ltd Building Product Quality Plan and has the plan audited and the Appraisal Certificate revalidated by BEAL on an annual basis.

10.3 Insulation Wholesalers Ltd. shall notify BEAL and obtain approval of any changes of the product specification or quality assurance prior to product being marketed, including any trade literature, website info or the like.

10.4 BEAL makes no representation 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 the Appraisal Certificate holder.

10.5 BEAL's verification of the building product or system complying with one or more of the above-mentioned criteria is given on the basis that the criteria used were those that were appropriate to demonstrate compliance with the NZBC at the date of this Appraisal Certificate. In the event that the criteria is withdrawn or amended at a later date, this Appraisal may no longer remain valid.

10.6 Any reference in this Appraisal Certificate to any other publication shall be read as a reference to the version of publication specified in this Appraisal Certificate.

Authorised Signatory

C R Prouse - Director
BEAL (Building Element Assessment Laboratory Limited)
[Revised and updated April 2025]

