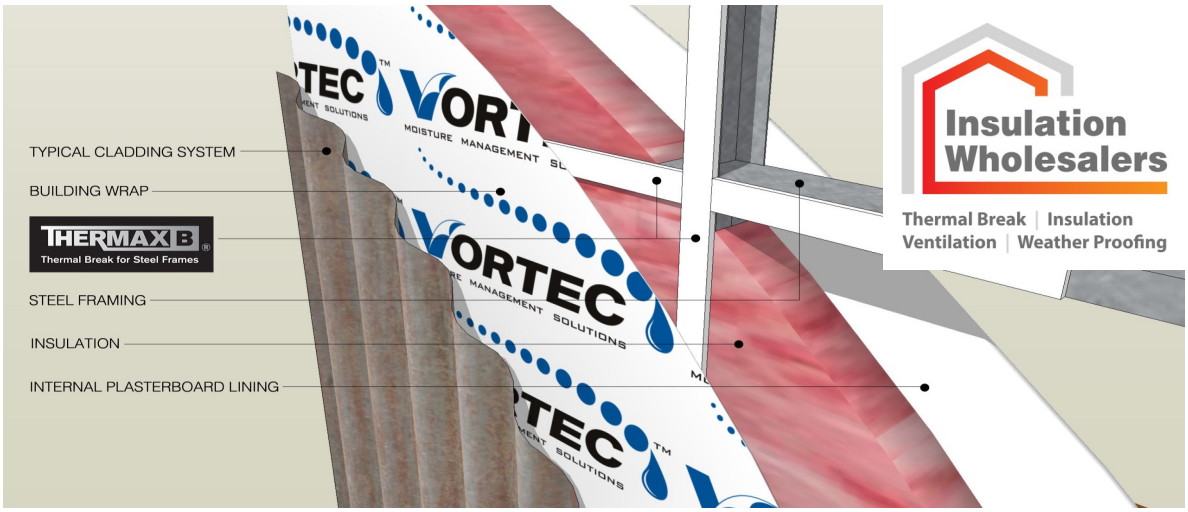
BEAL APPRAISED • BUILDING CODE COMPLIANT CA602

Expires 30 April 2025

BEAL Appraisal Certificate

ThermaX B® - a thermal break for use on steel framing



Product

1.0 ThermaX B® is an acceptable solution as an economic thermal break for steel framed walls and roof trusses.
Maintaining a thermal resistance value of a steel framing system in buildings is a requirement needed to demonstrate compliance with Clause H1 of the New Zealand Building Code.
This requirement especially applies to any part of a steel framed building that provide 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.
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.

Building Regulations

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

Clause B2 - Durability

The product when used in accordance with this Appraisal will meet Performance B2.3.1(b) 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

The product contributes to the performance requirement of clause E3.3.1 of the Building Code when used in accordance with this Appraisal. In other words, the product as appraised will provide "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

The product contains no hazardous materials and complies with clause F2.3.2 of the Building Code when used in accordance with this Appraisal.

Applicant:

Insulation Wholesalers Ltd
PO Box 1826
Palmerston North
TEL: 06 329 8065
www.insulationwholesalers.co.nz

Appraiser:

BEAL
2A Plimmerton Drive
Plimmerton, Porirua, NZ
Tel: +64 233 6661
Fax: +64 233 6662
E-Mail: sales@beal.co.nz
www.beal.co.nz

©Building Element Assessment Laboratory Ltd 2017 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions - www.beal.co.nz

Scope and Limitations

3.1 ThermaX B® has been specifically designed to act as a thermal break to prevent 'Thermal Bridges' between external cladding and steel framing and has been appraised as meeting the performance requirements of E3.3.1.
Fixings must not be over-tightened.

Technical Literature

4.1 The installation of ThermaX B® is described in the ThermaX B® Data Sheet Version 1 ref:TB000172 dated January 2006 which must be followed to ensure compliance with the Building Code.

Technical Specification

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 various thicknesses; 10mm 15mm and 20mm .

Handling and Storage

6.1 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.

Design Information

7.1 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 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 25°C as per ASTM C518,
10mm will have an R-value of 0.37
15mm will have an R-value of 0.55
20mm will have an R-value of 0.74
In BRANZ Feb/Mar 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® 10 mm thick strips exceed this requirement.
HD-XPS has a compressive strength 3 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

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.
In the opinion of BEAL the performance of extruded polystyrene (XPS) over the past fifty years confirms that the ThermaX B® does meet the requirements of Clause B2 (Durability) of the Building Code.

Internal Moisture - Clause E3

9.1 For assessing the ability for ThermaX B® to contribute to meeting the requirement of Clause E3 of the New Zealand Building Code, a series of assessments to simulate site installation conditions, were carried out.
Assessments included:

- The width and thickness of the product
- The product's ability to be fixed directly to steel framing
- Tear resistance
- Stiffness
- Resistance to compression when a corrugated sheet was screw fixed to the steel framing
- General 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 and or roof truss assembly when installed according to the conditions of this BEAL Appraisal.

Hazardous Building Materials - Clause F2

10.1 ThermaX B® is manufactured from non toxic materials.

Installation Information

Installation Skill Level Requirement

11.1 ThermaX B® can be applied by any competent tradesman 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

12.1 The product shall be installed as described in the ThermaX B® Data Sheet

© Building Element Assessment Laboratory Ltd 2017 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions - www.beal.co.nz

Version 1 ref:TB000172 dated January 2006. 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 or roof underlay is then laid over the thermal break, before the cladding or roofing is installed. The product can be installed by any competent tradesman with the appropriate tools.

Design Considerations

13.1 The following conditions must be observed -
• ThermaX B® may be fixed to the steel stud using either a 'wafer self-tapping screw' or approved adhesive such as Polysafe Spray 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, and this is especially the case with corrugated metal sheeting. The drill clutch must be set to avoid over tightening of the screws.
• The 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 Appraised number. E.g. *ThermaX B®: BEAL Appraised CA602.*

Health and Safety

14.1 The ThermaX B® thermal break presents no known health and safety issues when installed. Refer to the Material Safety Data Sheet.

Basis of Appraisal

15.1 Appraisal basis from:
- In-service history
- Trade Literature
- A calculation or test method from a laboratory

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 the Department of Building and Housing - refer www.dbh.govt.nz]

In addition, the following documentation was consulted:

15.2 New Zealand Building Code – Clause H1 Energy Efficiency
15.3 Acceptable Solutions E3/AS1
15.4 NZS 4214(INT):2002 Methods of determining the total thermal resistance of parts of buildings
15.5 NZS 4218:2004 Energy Efficiency – Small Building Envelope
15.6 HERA Report R4-72 The Thermal Insulation Performance Of Light-Weight Steel External Wall Elements.
15.7 BRANZ BULLETIN Number 572, June 2014.
15.8 Various web based documents giving a historic background to the origin,
manufacture and performance of extruded polystyrene.
15.9 A series of assessments carried out by BEAL.
15.10 Technical and trade literature provided by the manufacturer.

Conditions of Appraisal

16.1 The Products continue to comply with the quality assurance measures
of Insulation Wholesalers Ltd. These quality assurance measures have been viewed and approved by BEAL.
16.2 The products comply with the conditions of this appraisal and with the
ThermaX B® Data Sheet Version 1 ref: TB000172 dated January 2006.
16.3 Insulation Wholesalers Ltd continues to have the product range reviewed and quality assurance programme audited annually by BEAL.
16.4 The overall quality and performance of the products are maintained.
16.5 Insulation Wholesalers Ltd. shall notify BEAL of any changes in specification or quality assurance measures prior to them coming into effect.
16.6 BEAL staff use BQI Interim Performance Standards (in the absence of a relevant AS/NZS Standard) for carrying out field-testing and assessment of External Moisture factors. These assessments are performed either on site or in BEAL's facilities and carried out by experienced and qualified specialists.
16.7 The system has been tested against one or more of the following criteria which was applicable at the time of the initial assessment:
• a measurable criteria described in the Building Code
• a relevant New Zealand or Australian Standard
• a requirement set out in a Building Quality Institute Interim Performance Standard
• an appropriate requirement set out in a New Zealand Department of Building & Housing document
16.8 BEAL's verification of the building product or system as complying with one or more criteria is given on the basis that the criteria used were those that were used to demonstrate compliance with the Building Code at the date of this appraisal. In the event that the criteria are withdrawn or amended at a future date, this Appraisal may no longer remain valid.

Authorized Signatory

C R Prouse - Director
(Updated April 2018)

BEAL BUILDING ELEMENT ASSESSMENT LABORATORY LIMITED

BEAL APPRAISED BUILDING CODE COMPLIANT CA602

© Building Element Assessment Laboratory Ltd 2017 All rights reserved. Use of this document is subject to BEAL's Terms and Conditions - www.beal.co.nz