

Project

Assessment of Sealection 500

Client

Insulfoam Solutions



Building Code of Australia Evidence of Suitability Report completed by:



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Introduction

Third Ecology were commissioned by Insulfoam Solutions to review a new 'spray applied, semi-rigid, cellular polyurethane foam plastic' insulation product called '**Sealection 500**' for its suitability in terms of Building Code of Australia 'Evidence of Suitability' provisions as described in Section A2.2a – Evidence of Suitability, particularly A2.2 (vi) which requires: 'documentary evidence that correctly describes the properties and performance of the material'. Further, the independent testing for particular attributes and performance compliance

This report is seen as the means to validate Sealection 500 with Section A2.2a (vi) and A2.2b (ii) of the BCA. Further evidence as may be required under section A2.2c can be provide upon request by emailing: mark@thirdecology.com.au

Performance Specifications and Australian Standards

The following performance specifications have been determined for '**Sealection 500**' based on results from testing conducted in Melbourne by various NATA certified testing laboratories and relevant ASTM results from the US.

The relevant Australian Standards for this product would include the following:

AS 1366.1	Rigid Cellular plastics sheets for thermal insulation – Part 1: Rigid cellular polyurethane (RC/PUR)
AS 3999	Thermal insulation of dwellings – bulk insulation – installation requirements

Thermal Properties

Thermal performance for the product has been determined by James Fricker (specialist insulation evaluation Mechanical Engineer) based on test data completed in accordance with ASTM 518 and the AIRAH manual. A 90mm thick sample of the product has an R-value of 2.38 which compares more than favourably with other similar insulation products in the marketplace (eg R1.5 or R2 bulk insulation wall batts).

Additionally, third party test data provided by the US manufacturer demonstrates that commonly installed insulation batts can lose up to 28% of their R-value due to poor installation and overstating of the labeled R-value of the products. Due to the nature of the installation of Sealection 500 and its inherent characteristics, the installed product would appear to achieve as close as possible to 100% of the claimed R-value.

Air Infiltration

Testing conducted by the US manufacturer of the product demonstrates superior air sealing capabilities of the Sealection 500 product and the poor performance of factory produced insulation batts. Data from the third party testing laboratory suggests that this air seal characteristic inherent in Sealection 500 could reduce HVAC requirements in a home by up to 40% compared to standard insulation products which will easily offset the additional cost of the product when compared to other insulation products in the marketplace.

The average house in Victoria has 1.5 air changes / hour, and an energy efficient house should be less than 1.0 air change / hour. The abovementioned test data suggests that houses insulated with Sealection 500 will be substantially less than 1.0 air change per hour.

Fire Hazard Properties

Fire Hazard Properties for the product were tested by Warringtons Fire Testing in accordance with AS 1530.3 & 4 and achieved the following results.

✓ Ignitability Index	18	Regulatory Range 0 to 20
✓ Spread of Flame Index	0	Regulatory Range 0 to 10
✓ Heat Evolved Index	1	Regulatory Range 0 to 10
✓ Smoke Developed Index	7	Regulatory Range 0 to 10

An assessment of BCA Fire Hazard Properties by Curtain Consulting has been conducted to demonstrate BCA compliance when used in Class 1 and 10 and Class 2-9 buildings.

Acoustic Properties

Acoustic properties have been tested for the product by RMIT Acoustics Testing Laboratories according to AS 717.1 - 2004 and the following test results were achieved:

- ✓ 10mm plasterboard each side of 90mm timber stud frame and Sealection 500 cavity insulation = **RW 39**
- ✓ 10mm plasterboard each side of 92mm steel stud frame Sealection 500 cavity insulation = **RW 40**

Acoustic opinions have been prepared on this test data for a range of possible structural systems including that suitable for multi unit residential developments (The Building Code of Australia requires that party walls between apartments comply with $R_w + C_{tr} \geq 50\text{dB}$ and that party walls between an apartment and a corridor, lift shaft, stairway or plant room has to meet $R_w \geq 50\text{dB}$).

The following opinions were prepared by Graeme Harding & Associates (Consultants in Acoustics, Noise and Vibration):

- ✓ 4 layers fire rated p'board (2 layers on each side) on 90mm timber stud frame with 20mm airgap and resilient furring channel to one side and 180mm thick Sealection 500 - Estimated **R_w = 51dB**
- ✓ 5 layers fire rated p'board (2 layers on one side and 3 layers on opposing side) on double leafs of 90mm timber stud frame separated by 20mm airgap and 180mm thick Sealection 500 - Estimated **R_w + C_{tr} = 52dB**

Occupational Hygiene Assessment and MSDS

An 'Occupational Hygiene Assessment' and relevant MSDS was conducted on the application of the product by Bureau Veritas and includes a number of occupational recommendations that should be adhered to at all times to ensure applicator health and safety is maintained during application.

'Green' Product Accreditation Branding

The product has achieved the requirements of the following environmental branding certifications in the US and Canadian marketplaces:

- ✓ Energy Star (US -EPA)
- ✓ Canadian Environmental Choice Product: Eco-Logo ECP – 40

It is recommended that similar equivalent Australian accreditations should be sought for the product, such as:

- ✓ National Asthma Council Australia – 'Sensitive Choice'
- ✓ Good Environmental Choice – Australia
- ✓ Ecospecifier Accreditation

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Technical Specifications

The following technical specifications have been determined for 'Sealection 500' from local testing and product literature provided by the US based distributor of the product:

Thermal Insulation – 70mm thick = R 1.85
90mm thick = R 2.37
140mm thick = R 3.7

Ignitability Index	1	Regulatory Range 0 to 20
Spread of Flame Index	0	Regulatory Range 0 to 10
Heat Evolved Index	1	Regulatory Range 0 to 10
Smoke Developed Index	7	Regulatory Range 0 to 10

Sound Insulation (Acoustics) = RW 39

CFC's or HCFC's = None present - 100% water blown

Formaldehyde = None present

Air permeability = 0.000000039 L/s/m²

Maximum operating temperature = 82.2 C

Apparent Density – ASTM D1622 = 8kg/m³

Open Cell Count – ASTM D2856 = N/A

Compressive Strength – ASTM D1621 = 5kPa

Tensile Strength – ASTM D1623 = 17kPa

Water Absorption – ASTM D2842 = 47.9 %

Off Gassing test – ASTM D 1623 = No Toxic Vapours

Tensile Strength = 23.68 kPa

Compressive Strength = 5 kPa

Bacterial or Fungal growth = provides no food source

Water vapour permeability = 207.72 ng/Pa.s.m²

Corrosion Resistance = Does not cause corrosion to steel