

Memorandum

To: Insulfoam Solutions – Australia
From: Mac Sheldon, Technical Rep – Asia Pacific
Re: Mold and Micro-organisms
Date: June 6, 2008

Sealection™ 500 spray foam insulation is a low-density polyurethane spray foam that is air-impermeable, and because it is an inert plastic, provides no food value for mold, mildew, insects or rodents. Unlike fiberglass or wool insulation, Sealection™ 500 does not allow air movement within the insulation mass thereby eliminating the potential for mold spores, bacteria or viruses to flow into or through it. Sealection™ 500 also does not allow moisture laden air to flow through it, therefore dramatically reducing the amount of moisture that will penetrate the foam in vapor form.

Demilec (USA) LLC has conducted numerous tests to determine the physical properties of Sealection™ 500, including ASTM 1338 which concludes that Sealection™ 500 is not a food source for mold and will not propagate mold. ASTM E-283 demonstrates that Sealection™ 500 is considered an air barrier as it allows less than 0,02 l/sm² to penetrate the material at 75 Pascals of pressure difference across the foam.

No other insulation available can provide the air sealing capability of sprayed polyurethane foam, and of the sprayed foams, Sealection™ 500 provides the highest level of protection due to the consistence at which it's applied and the rate and volume that it expands. Sealection™ 500 is sprayed onto the substrate about the consistency of latex paint and expands 120 times within about 7 seconds. In its liquid state the foam is able to penetrate even small openings, cracks and crevices, and as it expands it fills those areas with an inert foam plastic, yet there's not enough expansion pressure created by the reaction to move any of the framing materials.

Air infiltration is the greatest problem for building scientists in controlling indoor air quality. Along with the air that moves freely through other types of insulation can be mold spores, hydrocarbons, pollen, dust, bacteria, viruses, smoke, soot, ozone, and all other pollutants common to the outdoor ambient atmosphere. Likewise certain hazardous substances from inside can flow with exfiltrating air into and through the walls. Of course the first line of defense for air moving though the skin of the building is an air barrier such as gypsum wall board, but these membranes are often imperfect and with adequate pressure differential can allow polluted air to pass. Since Sealection™ 500 is air impermeable no pollutants will pass through it in either direction even if the interior gypsum board or exterior cladding is breached.

Please refer to the attached ASTM test data to confirm the air permeance and mold proliferation potential as stated above, and please direct any questions regarding the above statements to Demilec (USA) LLC or to our Australian distributor, Insulfoam Solutions.



Test Report

**Fungi Resistance Measurement According to ASTM C 1338 on Sealection™ 500
Supplied by Demilec (USA), LLC on March 7, 2003**

Prepared For:

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R & D Services, Inc.
P.O. Box 2400
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Report: RD03161R

Reviewed by: Ronald S. Graves
Ronald S. Graves
Vice President

April 18, 2003

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Test Report for Resistance to the Growth of Fungi

Report Summary

Manufacturer: Demilec (USA), LLC
Material Description: Sealection™ 500
ASTM Test Method: C 1338
Project Number: 1236
Specimen Number: 1236030307-1
Report Number: RD031287FR
Date of Report: April 10, 2003
Period of Test: March 13, 2003 – April 10, 2003
Test Result: Pass
Number of Specimens Observed: 3
Comparative Material: Southern Yellow Pine
Fungi Checked for Viability: Yes
Regular or Extended Test: Regular

Background

The ASTM Standard Specification for many thermal insulations requires a test for the resistance of the insulation to the growth of fungi. Section 10 of C 1497, ASTM C 1338, Section 6.6 of ASTM C 1149, or Section 11 of ASTM C 739 are commonly used in the case of building materials. Evaluations for fungi growth are based on visual examinations at 40X magnification. The examinations at 40X magnification compare fungal growth on the material being evaluated with the fungal growth on an untreated comparative material that is exposed to the same environment as the test specimens. Both the material being tested and the comparative material are inoculated with a mixed spore suspension containing five specific fungal species to start the test. Since most fungi thrive in a relatively narrow range of temperature and humidity, inoculated specimens and comparative materials are maintained within temperature and relative

humidity ranges specified in the test method for the 28-day growth period. The purpose of the test is to provide an evaluation of the potential for fungal growth present in the insulation material relative to common types of wood used in building construction. The fungal species used in the tests for thermal insulation are listed below.

<i>Aspergillus niger</i>	ATCC 9642
<i>Aspergillus flavus</i>	ATCC 9643
<i>Aspergillus versicolor</i>	ATCC 11730
<i>Penicillium funiculosum</i>	ATCC 11797
<i>Chaetomium globosum</i>	ATCC 6205

A mixed spore suspension is produced from the above five species in accordance with the test method being followed. The viability of each of the five species is verified with each test as required by the test method being used. The ASTM test methods for resistance to fungal growth require a 40X visual comparison of test material and comparative materials 28 days after inoculation. The criteria for a pass/fail result at the end of the 28-day test period depends on the test method being followed.

Product

Sealection™ 500 is a semi-rigid, low-density polyurethane foam that is spray applied as an insulation component of floors, ceilings, and wall assemblies. The material is a two-component system, open-cell that is fully water blown having a low density of 0.5 pcf (8 kg/m³). The polyurethane foam is produced by combining a polymeric isocyanate and a resin B500. The by-products of the reaction include carbon dioxide and steam, which act together as a blowing agent. Sealection™ 500 is spray applied using a fixed ratio (1/1) volumetric positive displacement pumps.

Test using ASTM C 1338

Each of the replicate test specimens shall be determined to have either no fungal growth, fungal growth not greater than the comparative material, or fungal growth greater than the comparative material.

Results	Specimen	<u>Fungal Growth Comparison</u>
	1	<u>No fungal growth.</u>
	2	<u>No fungal growth.</u>
	3	<u>No fungal growth.</u>

The pass/fail result: Pass

Basis for the pass/fail result: All three specimens passed.

This R&D Services, Inc. test report and the evaluation contained in the report are limited to the material tested. The extent to which the material tested is representative of the product being manufactured is the sole responsibility of the manufacturer. The test results are not purported to predict the performance of the material in a building or installation.

Rita M. Thompson
Evaluation

04-18-03
Date

Ronald S. Brada
Review

04-18-03
Date

Reference:

ASTM C 1338, "Standard test Method for Determining Fungi Resistance of Insulation Materials and Facings", 2002 Annual Book of ASTM Standards, Vol. 04.06, pp. 721-723.

Intertek ETL SEMKO

REPORT OF

**PERFORMANCE TESTING TO
ASTM E283-04 "STANDARD TEST METHOD OF AIR LEAKAGE THROUGH EXTERIOR WINDOWS,
CURTAIN WALLS, AND DOORS UNDER SPECIFIED PRESSURE DIFFERENCES ACROSS THE
SPECIMEN"**

**CONDUCTED ON A 4' x 4' SEALECTION™ 500 SPRAY FOAM INSULATION (VARIOUS
THICKNESSES) AND FIBERGLASS INSULATION STUD WALL ASSEMBLIES**

**3-1/2" THICK SEALECTION™ 500 SPRAY FOAM INSULATION (2" X 4" FRAMING)
5-1/2" THICK SEALECTION™ 500 SPRAY FOAM INSULATION (2" X 6" FRAMING)
7-1/2" THICK SEALECTION™ 500 SPRAY FOAM INSULATION (2" X 8" FRAMING)
5-1/2" THICK OWENS CORNING R19 FIBERGLASS WITHOUT KRAFT PAPER VAPOUR BARRIER
(2" X 6" FRAMING)
5-1/2" THICK OWENS CORNING R19 FIBERGLASS WITH KRAFT PAPER VAPOUR BARRIER
(2" X 6" FRAMING)**

FOR

**DEMILEC USA, LLC
2925 GALLERIA DRIVE
ARLINGTON, TEXAS, USA
76011**

REPORT PREPARED BY RON PRENTICE

**INTERTEK TESTING SERVICES NA LTD.
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REPORT NUMBER: 3098752-TOR-02-A

**DATE: AUGUST 25, 2006
REVISED: SEPTEMBER 08, 2006**

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PREFACE

All services undertaken are subject to the following general policy:

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INTRODUCTION

Intertek Testing Services N.A. Ltd. (Intertek) has conducted performance tests on nominal 4' x 4' Sealection™ 500 polyurethane spray foam insulation (various thicknesses) and fibreglass insulation stud wall assemblies submitted to our laboratory on July 6th 2006. The Sealection™ 500 liquid components were randomly sampled from Demilec stock by an Intertek representative on June 6th 2006. Installation of the Sealection™ 500 spray foam insulation into the 4' x 4' stud wall cavities was witnessed and inspected by an Intertek representative on June 26th 2006. FRP panels were used as backing for the application process and were removed after the foam had cured properly. This left the foam adhered only to the wood framework supporting the foam at its edges. Testing on the insulated wall assemblies was carried out on July 17, 2006. All tests were performed in accordance with the test standard ASTM E283-04.

PRODUCT DESCRIPTIONS

- | | |
|-----------------------|--|
| Series | <ul style="list-style-type: none">• Demilec USA LLC, Sealection™ 500 |
| Designation | <ul style="list-style-type: none">• 0.5 pcf Open Cell Spray Foam Insulation |
| Type (general) | <ul style="list-style-type: none">• Open Cell Polyurethane Spray Foam Insulation |
| Material | <ul style="list-style-type: none">• Sealection™ 500 Open Cell Spray Foam Insulation. |
| Samples tested | <ul style="list-style-type: none">• 3-1/2" thick Sealection™ 500 (2" x 4" Framing)• 5-1/2" thick Sealection™ 500 (2" x 6" Framing)• 7-1/2" thick Sealection™ 500 (2" x 8" Framing) |
| Test Boxes | <ul style="list-style-type: none">• Foam spray was tested in 4' x 4' wood test bucks with wood studs on 16" centres. |
| Series | <ul style="list-style-type: none">• Owen Corning R19 Fiberglass™ |
| Designation | <ul style="list-style-type: none">• Fiberglass |
| Type (general) | <ul style="list-style-type: none">• Fiberglass |
| Material | <ul style="list-style-type: none">• Owen Corning R19 Fiberglass |
| Samples tested | <ul style="list-style-type: none">• 5-1/2" Thick Owen Corning R19 Fiberglass with Kraft Paper vapour barrier on interior (2" x 6" Framing).• 5-1/2" Thick Owen Corning R19 Fiberglass without Kraft Paper vapour barrier (2" x 6" Framing). |
| Test Boxes | <ul style="list-style-type: none">• Fiberglass was tested in a 4' x 4' wood test bucks with wood studs on 16" centres. |

TEST PROGRAM

Air Leakage Test

The Air leakage tests were conducted in accordance with ASTM E283-04, "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen,"

The Air leakage tests were performed using different test pressures ranging from 75 Pa (1.57 psf), to 2000 Pa (41.77 psf). The air leakage rate was calculated in units of L/s/m².

TEST APPARATUS

The test equipment used to determine air leakage through stud wall assemblies described in this report was as shown in the following table:

Test	Application	Equipment	Intertek ID#
Air Leakage	To develop the test pressures	Air blower	--
	Air infiltration testing	Meriam Instrument Co. laminar flow element, Model No. 50MW20-2F, Serial No. 74690-K1	280-01-0059 280-01-0573
		Ashcroft 0-0.5" W.C to 0-5 VDC pressure transducer Model No. XLDP, Serial No. 20226-123	
		Sciometric Instruments System 200 analog to digital converter.	280-01-0018
	Test Pressure between wall and sample To measure the laminar flow element inlet pressure	Vacuum Motor	
Ashcroft pressure transducer Model No. XLDP			
Sciometric Instruments System 200 analog digital converter		280-01-0018	
	Calibrated 0-0.5" W.C Mechanical manometer	280-01-0723	
	Calibrated 0-15" W.C Mechanical manometer	280-02-0081	
	Calibrated 0-30" W.C Mechanical manometer	280-01-0628	

TEST RESULTS

1. Air Leakage Tests

Test Sample No. 1;
Sealection™ 500 3-1/2" Thick (2" x 4" Framing)

Pressure Differential: 75 Pa

Air Leakage: 0.000 L/s/m² (No air leakage detected)

2. Air Leakage Tests

Test Sample No. 2;
Sealection™ 500 5-1/2" Thick (2" x 6" Framing)

Pressure Differential: 75 Pa

Air Leakage: 0.000 L/s/m² (No air leakage detected)

3. Air Leakage Tests

Test Sample No. 3;
Sealection™ 500 7-1/2" Thick (2" x 8" Framing)

Pressure Differential: 75 Pa

Air Leakage: 0.000 L/s/m² (No air leakage detected)

Pressure Differential: 140 Pa

Air Leakage: 0.000 L/s/m² (No air leakage detected)

Pressure Differential: 1200 Pa

Air Leakage: 0.000 L/s/m² (No air leakage detected)

Pressure Differential: 1500 Pa

Air Leakage: 0.028 L/s/m²

Pressure Differential: 2000 Pa

Air Leakage: 0.028 L/s/m²

4. Air Leakage Tests

Test Sample No. 4;
Owen Corning R19 Fibreglass 5-1/2" Thick (2" x 6" Framing)
With out Kraft Vapour Barrier
Paper backing

Pressure Differential: 75 Pa

Air Leakage: (Above Upper Limits of Equipment) L/s/m²

5. Air Leakage Tests

Test Sample No. 5;
Owen Corning R19 Fibreglass 5-1/2" Thick (2" x 6" Framing)
With Kraft Vapour Barrier
Paper backing


Pressure Differential: 75 Pa

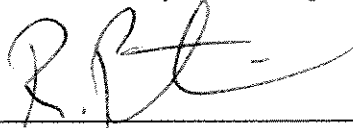
Air Leakage: 34.31 L/s/m²


CONCLUSION

Sealection™ 500 spray foam insulation; when tested in accordance with ASTM E283-04, for thicknesses of 3.5", 5.5", and 7.5", measured at pressure differential of 75 Pa; has an air leakage rate of less than 0.02 L/s/m². These tests were conducted on the bare foam adhering only to the edges of the wood framework.

INTERTEK TESTING SERVICES NA LTD.

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