

CLIENT: Quik-Therm Insulation Solutions Inc.
991 St. James Street
Winnipeg, MB
R3H 0X2
Attn: Raymond Belanger

Test Report No: T1035-3	Date: June 30th, 2017
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SAMPLE ID: Quik-Therm, foil faced (both sides) expanded polystyrene (EPS) foam samples measuring 1219mm (48") wide by 1219mm (48") long by 13mm (1/2") thick (nominal).

SAMPLING DETAIL: Test samples were not independently selected and were sent directly to QAI's Vaughan laboratory from the Quik-Therm Winnipeg, MB facility.

DATE OF RECEIPT: The samples were received at QAI Laboratories on May 31st, 2017.

TESTING PERIOD: June 22nd to June 29th, 2017.

AUTHORIZATION: Signed QAI Test Proposal Number 17MM05161r1 dated May 17th, 2017 by Raymond Belanger.

TEST(S) REQUESTED: **ASTM E2178-13**, "Standard Test Method for Air Permeance of Building Materials".

TEST RESULTS: The average air permeance of the tested 1/2" Quik-Therm EPS Boards, Foil Faced on both sides was found to be 0.0139 L/s-m². It was found to meet the requirements of an air barrier as outlined in Section 5.4.1.2 (Division B) of the National Building Code of Canada, 2015.

Prepared By



Robert Giona
Senior Technologist

Signed for and on behalf of
QAI Laboratories Ltd.



Matt Lansdowne
Business Manager

**AIR PERMEANCE AS PER ASTM E 2178****Test Procedure**

Testing was conducted in accordance with ASTM E 2178-13. Five samples measured nominally 1000mm x 1000mm (44" x 44") with an average thickness of 13mm (0.500"). The specimens were conditioned for a minimum of 7 days at $21 \pm 1^\circ\text{C}$ and $40 \pm 5\%$ relative humidity prior to testing. Air permeance testing was conducted at six pressure differentials as follows: 25 Pa (0.5 psf), 50 Pa (1.0 psf), 75 Pa (1.2 psf), 100 Pa (2.1 psf), 150 Pa (3.1 psf), and 300 Pa (6.3 psf). Each sample in turn was sealed to the test chamber. The sample was then covered with 6 mil poly sheeting, the poly sheeting being sealed to the specimen perimeter. Extraneous air leakage measurements were then taken at the six aforementioned pressure differentials, in an exfiltration direction. The poly film was then removed. Total air leakage measurements were then taken at the six aforementioned pressure differentials. The flow rate through the test sample was calculated by subtracting the extraneous air leakage readings from the total air leakage readings at each of the six pressure differentials. The air permeance was then calculated by using flow rate equations established by fitting the data, and errors estimated as per Annex A1 of the standard. The air permeance at 75 Pa (1.2 psf) shall be taken from the linear regression line ($r^2 = 0.99$) of the 30 data points.

Specimen No.	Nominal Thickness (mm)	Air Permeance @ 75 Pa		Governing (Max.) Air Permeance
		Infiltration (L/s·m ²)	Exfiltration (L/s·m ²)	
1	13	n/a	0.0080	0.0080
2	13	n/a	0.0167	0.0167
3	13	n/a	0.0155	0.0155
4	13	n/a	0.0152	0.0152
5	13	n/a	0.0140	0.0140
Average	13	n/a	0.0139	0.0139

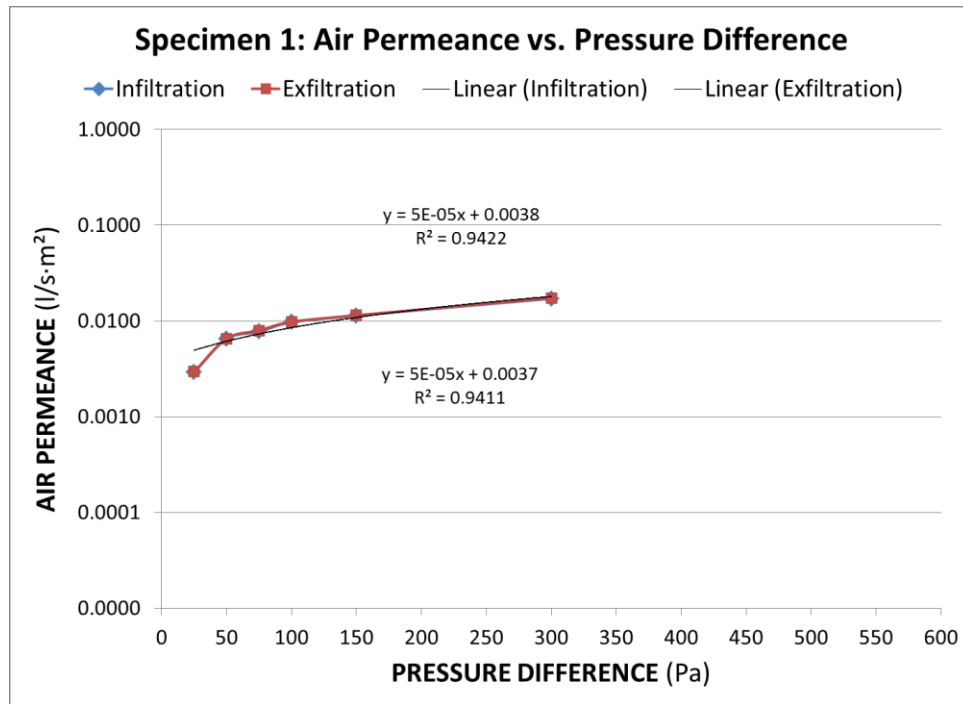
**NOTE: Exfiltration testing was performed on one sample only as the product is symmetrical and permeance ratings were found to be similar for both infiltration and exfiltration.

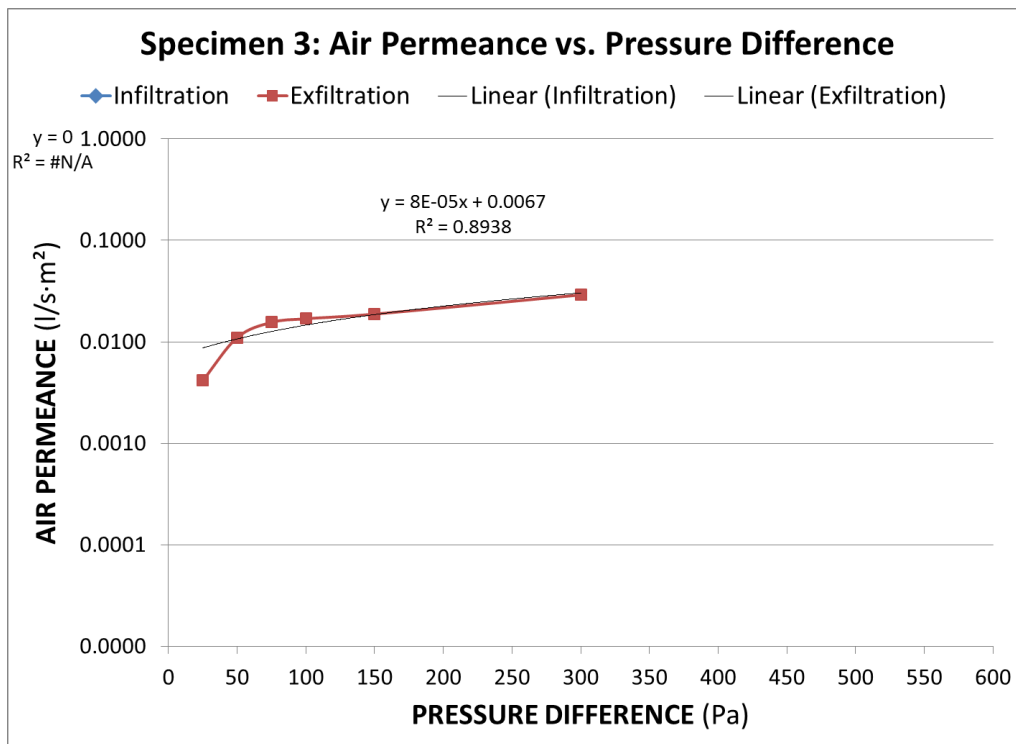
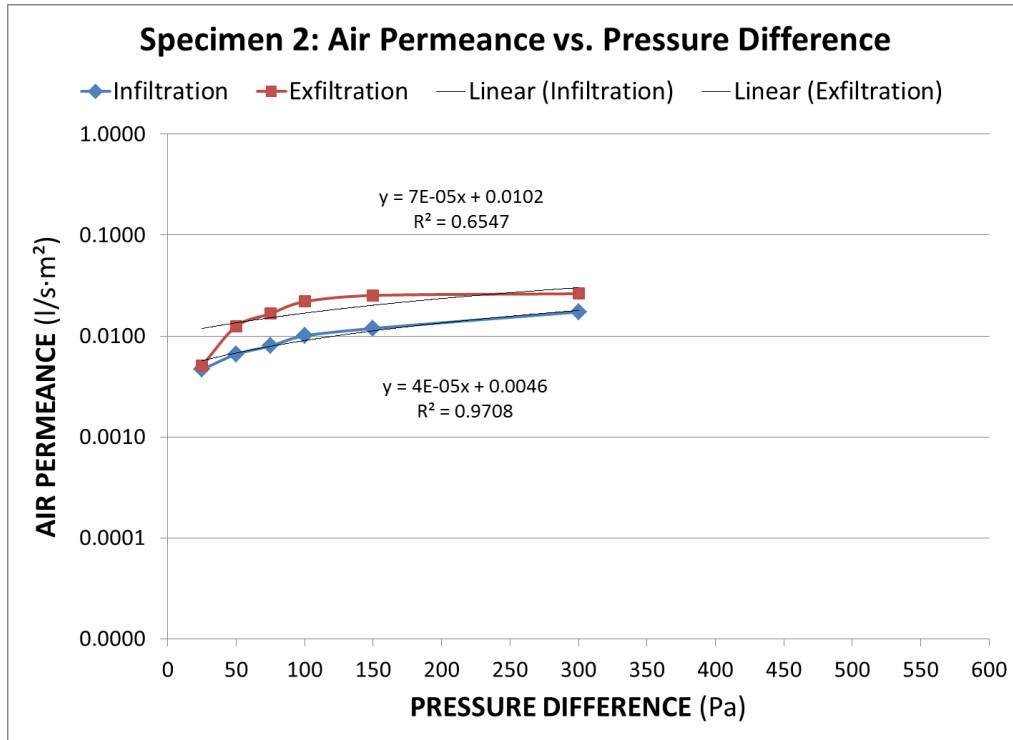
Test Pressure (Pa)	Air Infiltration at Standard Conditions (L/s·m ²)					
	Specimen #1	Specimen #2	Specimen #3	Specimen #4	Specimen #5	Average
25	0.0029	0.0051	0.0042	0.0047	0.0045	0.0043
50	0.0065	0.0125	0.0110	0.0091	0.0086	0.0095
75	0.0080	0.0167	0.0155	0.0152	0.0140	0.0139
100	0.0098	0.0219	0.0169	0.0170	0.0159	0.0163
150	0.0115	0.0252	0.0188	0.0263	0.0213	0.0206
300	0.0174	0.0263	0.0290	0.0288	0.0286	0.0260

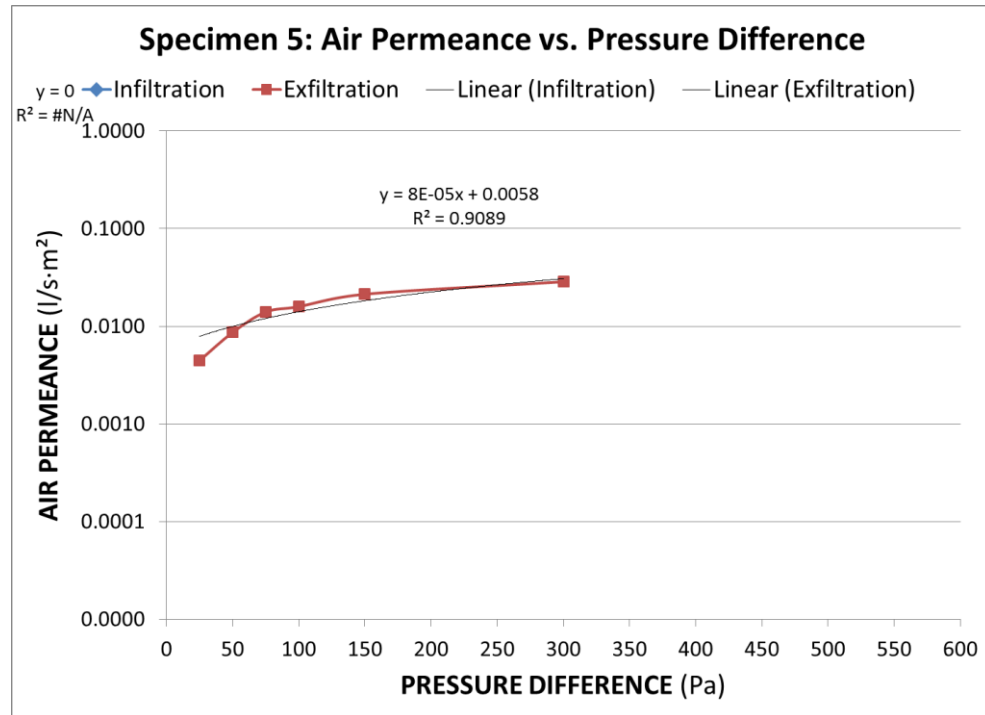
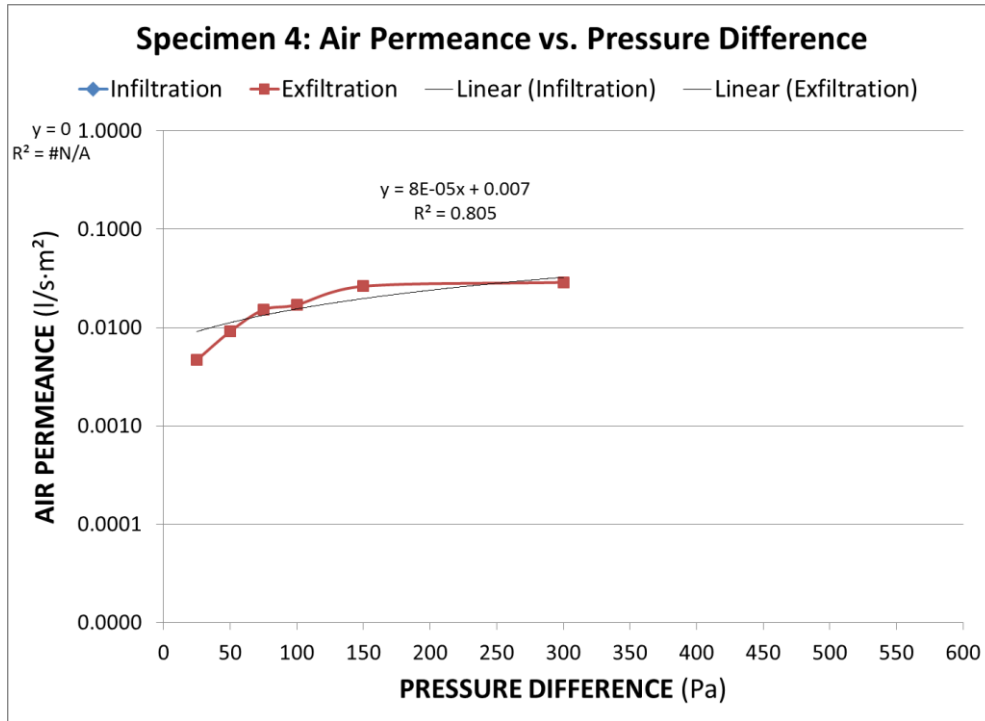
AIR PERMEANCE AS PER ASTM E 2178 (contd)

Test Pressure (Pa)	Air Infiltration at Standard Conditions After Re-measurement (L/s•m ²)	Percent Difference After Re-measurement
	Specimen #1	Specimen #1
100	624.3	0.3%
75	505.7	0.4%
50	413.6	0.2%

Percent difference for verification is within 10% of initial values, as specified by Sect. 8.2.8 of ASTM E 2178.







Error Analysis

As required in ASTM E 2178-03, an error analysis was performed to correct for variability in the test procedure. Readings were corrected for temperature and atmospheric pressure per ASTM E 283. The recorded values were averaged, and plotted on a straight line graph of Air Flow vs. Pressure, and the equation of the line of the graph was fit to the formula $Q = C A (\Delta P)^n$, where:

Q = Flow rate (L/s)

C = Air pressure coefficient

n = Air pressure exponent

ΔP = Pressure differential at a given reading

Using the above derived equation of $y = 5E-05x + 0.0037$ from Specimen #1, at a pressure differential of $x = 75$ Pa, the air permeance is calculated to be 0.0080 L/s·m² at 75 Pa at a material thickness of 13mm (1/2").