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**COMPARISON EVALUATION OF THE AIR PERMEANCE PROPERTIES OF A
WOVEN HOUSE-WRAP MATERIAL WITH AND WITHOUT AN EXTERIOR APPLIED COAT
OF PEANUT BUTTER IN ACCORDANCE ASTM E 2178-03**

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Report No.:	11-06-M0027 7 Pages
Proposal No.:	N/A
Date:	January 13, 2011

1.0 INTRODUCTION

At the request of *Building Professionals*, Exova was requested to compare the air permeance properties of a generic woven “House Wrap” air barrier material with and without a peanut butter coating in accordance ASTM E2178-03.

Test Configuration 1:

Product Identification:	Generic House-Wrap (Woven), Without Peanut Butter Coating
Exova Specimen No.:	11-06-M0027-1
Material Thickness:	0.47 mm

Test Configuration 2:

Product Identification:	Generic House-Wrap (Woven), Coated with Smooth Peanut Butter
Exova Specimen No.:	11-06-M0027-2
Peanut Butter Information:	Kraft Peanut Butter, Smooth Commercially Purchased at Loblaws Queens Quay Market, 10 Lower Jarvis Street, Toronto, ON, M5E 1Z2 on January 12, 2011 Product Code: M12:42 (11 MA 17) – both jars



Figure 1 – Peanut Butter Used for Air Barrier Application Coating

2.0 PROCEDURE

The Building Performance Centre at Exova, Mississauga was requested by *Building Professionals* to conduct air permeance testing in accordance with ASTM E2178-03, “*Standard Test Method for Air Permeance of Building Materials.*”

3.0 TEST INFORMATION

The first specimen configuration tested, Exova Specimen No. 10-06-M0027-1 (*specimen without peanut butter coating*), was sealed within the air leakage test chamber as prescribed by ASTM E2178-03 (*Figure 2*). Air was exhausted from the chamber at rates required to maintain the following test pressure differences: 25, 50, 75, 100, 150, 250 and 300 Pa. At each successive pressure, the air leakage through the specimen was measured and the specimen monitored for any physical changes. The air leakage of the specimen was then to be re-measured at pressure differentials of 100, 75 and 50 Pa, as required by the test procedure.

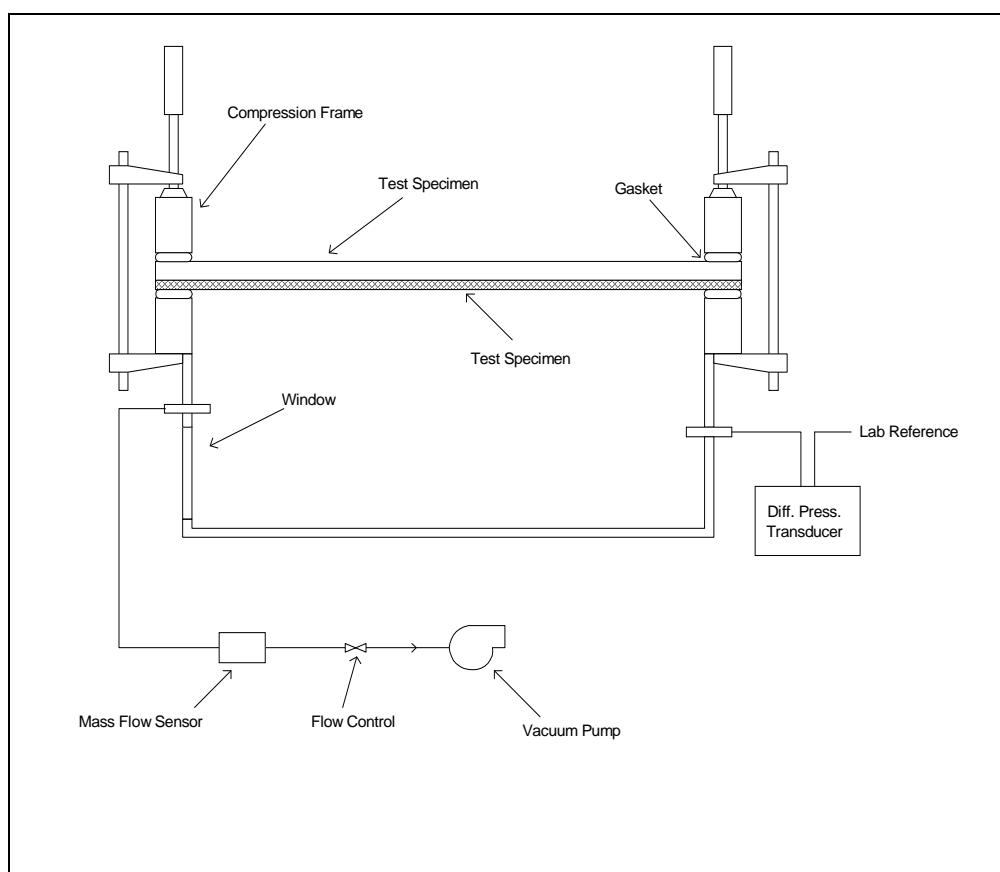


Figure 2 – Schematic of Test Apparatus

Upon the test completion of Exova Specimen No.: 11-06-M0027-1, the specimen remained clamped and setup in the test chamber and a trowel-applied coating of peanut butter (~0.5 mm thick) was applied to the house-wrap material. Upon the application of this coating, the specimen configuration was renamed Exova Specimen No.: 11-06-M0027-2 and re-tested as previously stated. Photographs of the peanut butter application are located on the following pages in Figures 3-5.



Figure 3 – Trowel Application of Peanut Butter

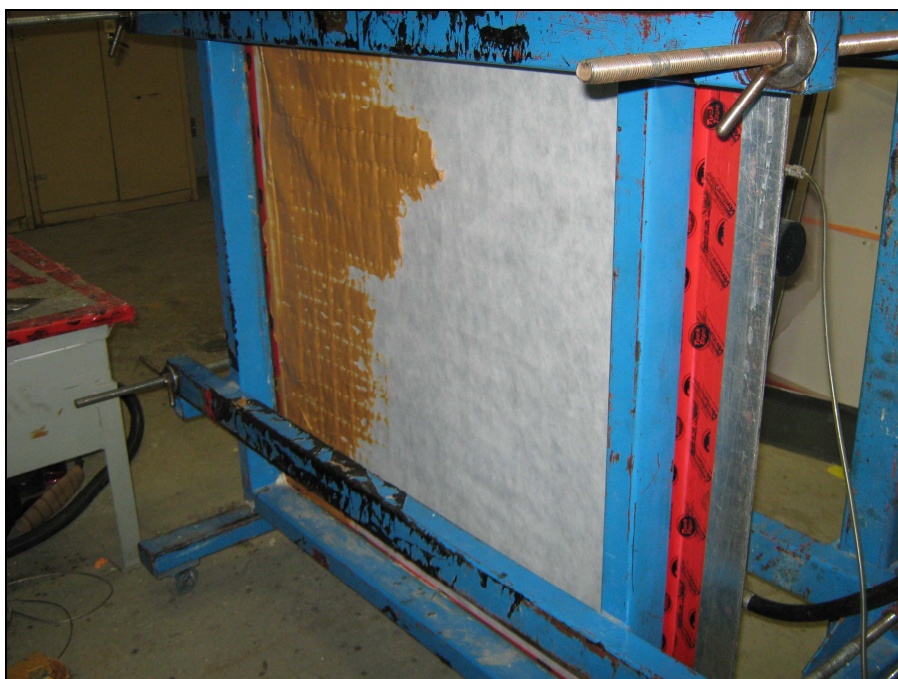


Figure 4 – Partial Application of Peanut Butter to Test Specimen

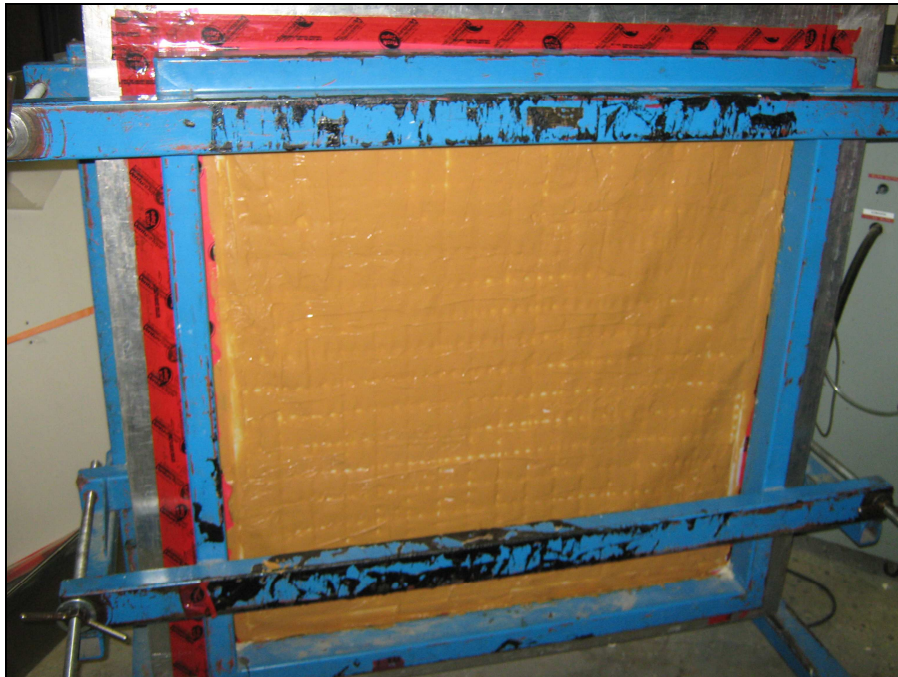


Figure 5 –Full Application of Peanut Butter

Test Date:	<u>Exova Specimen No.:</u>	<u>Test Date:</u>
	11-06-M0027-1	January 13, 2011
	11-06-M0027-2	January 13, 2011

4.0 RESULTS

Table 1 - Summarized Test Results in Accordance with ASTM E2178-03 (Negative Pressure)			
Differential Pressure (Pa)	<u>Calculated Flow</u> (L/(s·m ²))		Requirement
	Specimen No.: 11-06-M0027-1 (Without Peanut Butter Coating)	Specimen No.: 11-06-M0027-2 (With Peanut Butter Coating)	
25	0.0184	0.0009	NBC Section 5.4.1.2 States: Material intended to provide the principal resistance to air leakage shall have an air leakage characteristic not greater than 0.02 L/(s·m ²) measured at an air pressure difference of 75 Pa.
50	0.0340	0.0015	
75	0.0487	0.0021	
100	0.0628	0.0026	
150	0.0899	0.0035	
300	0.1659	0.0059	
100	0.0630	0.0026	
75	0.0502	0.0020	
50	0.0364	0.0014	

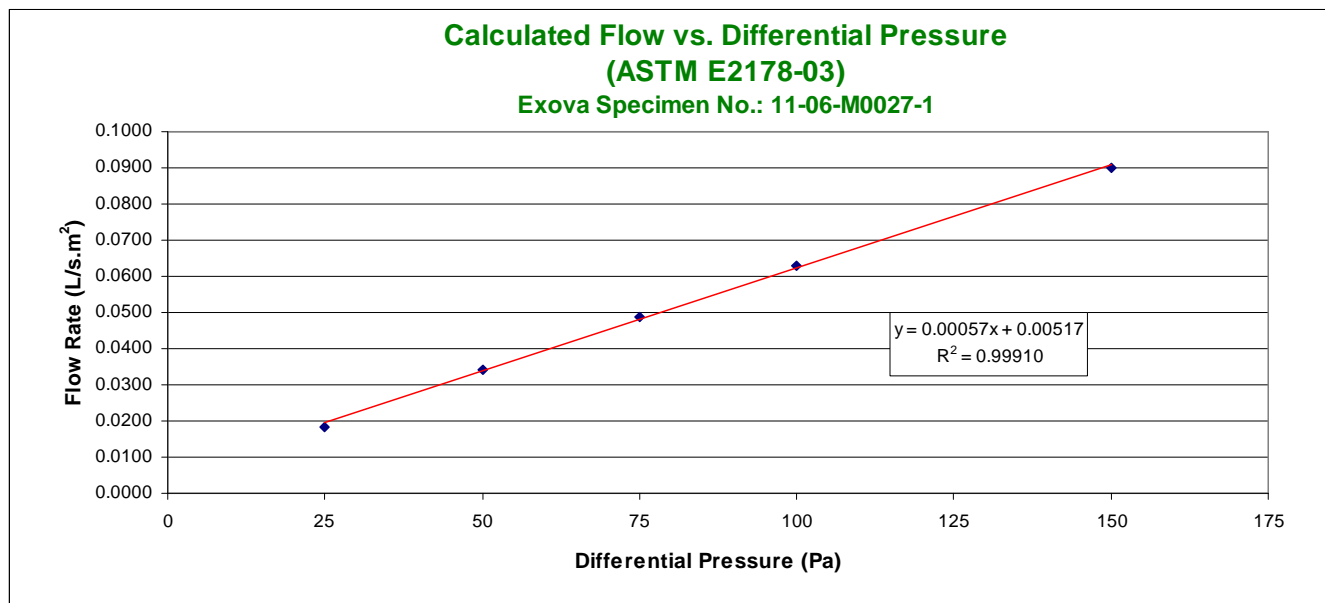


Figure 6 – Calculated Air Flow vs., Differential Pressure Specimen No. 11-06-M0027-1
(Specimen without Peanut Butter)

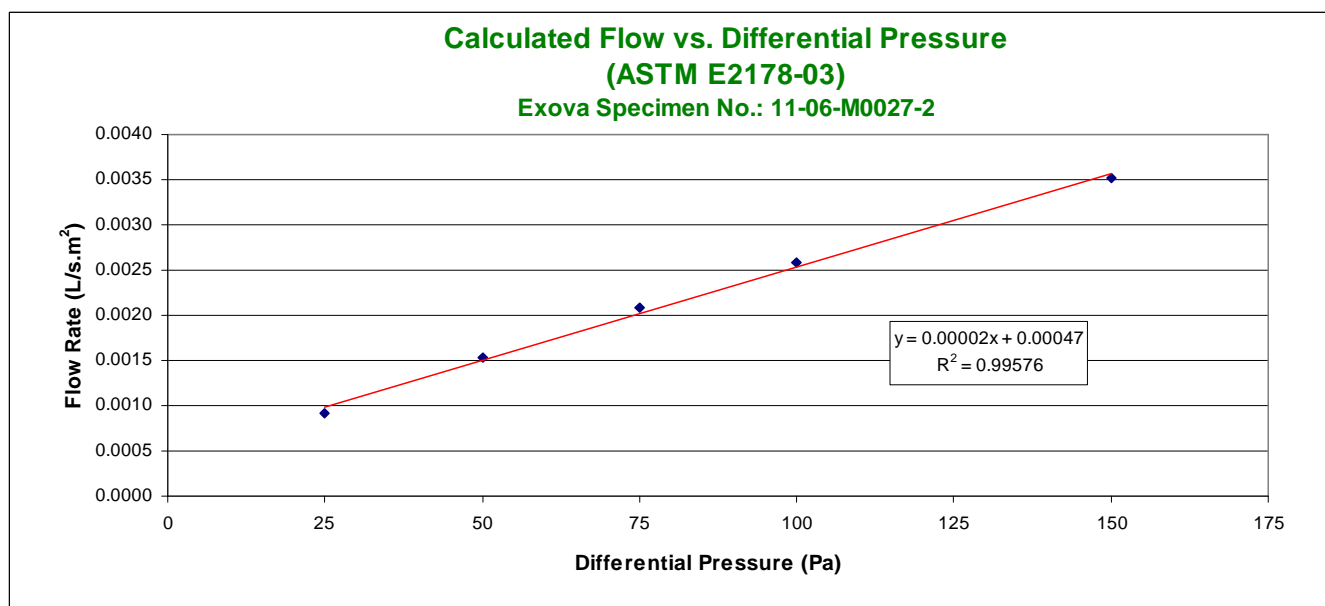


Figure 7 – Calculated Air Flow vs., Differential Pressure Specimen No. 11-06-M0027-2
(Specimen with Peanut Butter Coating)

5.0 CONCLUSION

Based on the results summarized in Section 4.0, Exova Specimen No.: 11-06-M0027-1 (*specimen without peanut butter coating*) did not meet the air leakage resistance requirements of less than $0.02 \text{ L/(s}\cdot\text{m}^2)$ at 75 Pa as stated in the 2005 National Building Code, Section 5.4.1.2.

However, Exova Specimen No. 11-06-M0027-2 (*specimen coated with peanut butter*) achieved an air leakage result of $0.0021 \text{ L/(s}\cdot\text{m}^2)$, which is below the required air leakage resistance requirement of $0.02 \text{ L/(s}\cdot\text{m}^2)$.

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