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**EVALUATION OF EMSEAL CORPORATION'S
"SEISMIC COLORSEAL (2")" EXPANSION JOINT MATERIAL FOR AIR LEAKAGE,
WATER PENETRATION RESISTANCE AND STRUCTURAL PERFORMANCE**

Report to:	Emseal Corporation 120 Carrier Drive Rexdale, Ontario M8W 5R1
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Report No.:	09-06-M0379-A, Revision 1 6 Pages, Appendix A
Proposal No.:	09-006-7677
Date:	December 16, 2009

1.0 INTRODUCTION

At the request of Emseal Corporation, Exova was retained to conduct a performance evaluation of the air leakage resistance, water penetration resistance and the structural performance properties of a specimen identified as "Seismic Colorseal (2")" expansion joint material as outlined in Exova Proposal Number 09-006-7677.

Upon receipt, the specimen was assigned the following Exova Specimen Number:

Client Specimen Description
Seismic Colorseal (2")

Exova Specimen No.
09-06-M0379

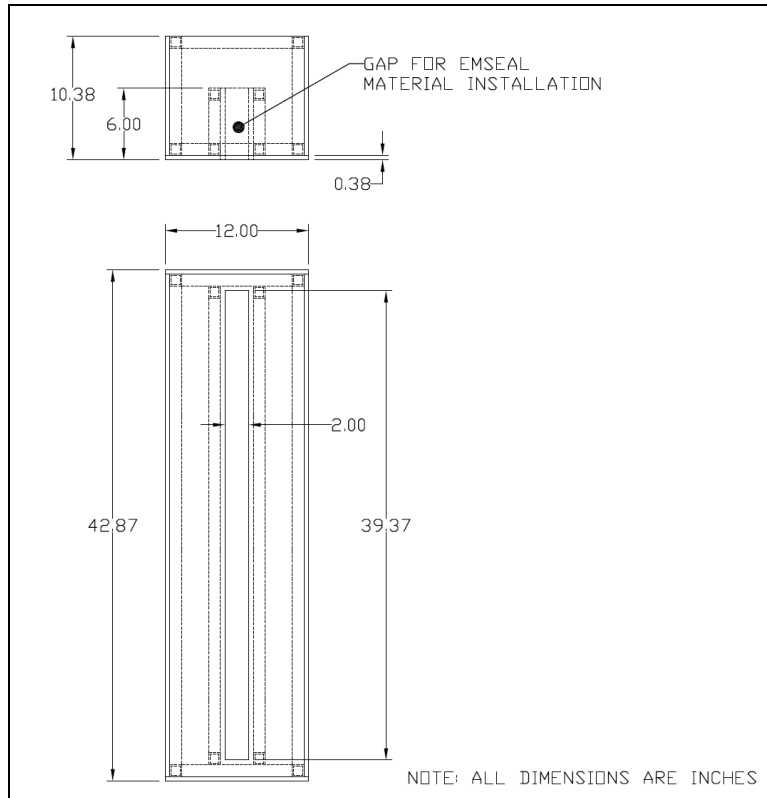
2.0 PROCEDURE

Test Description	Test Method
Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen	ASTM E283-04
Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference	ASTM E331-00(2009)
Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference	ASTM E330-02 (Procedure A)

Note: SI Units are the Primary Unit of Measure

Testing Outline:

As outlined in Exova proposal number 09-006-7677, a steel test fixture was constructed which comprised of a 51 mm (wide) x 152 mm (deep) x 1000 mm (long) gap for the installation of the specimen. A fabrication detail of the test fixture is located in Figure 1.



The expansion joint material (Exova Specimen: 09-06-M0379) was installed in the test fixture's gap by a representative from Emseal at Exova's Mississauga testing facility on November 2, 2009. Photographs of the specimen's installation are located in Appendix A.

Upon installation, the specimen was allowed to cure in the test fixture for five (5) days at ambient laboratory conditions prior to any testing.

Testing was conducted on November 9, 2009 and the following testing protocol was requested by Emseal:

- i. Initial air leakage measurements taken at 25, 50, 75, 100, 150, 250 & 300 Pa (ASTM E238); Infiltration case.
- ii. Water penetration resistance at 500 & 1000 Pa (ASTM E331)
- iii. Structural performance testing at ± 500 , ± 1213 , ± 2730 , ± 4854 Pa (ASTM E330)
- iv. Water penetration resistance at 5000 Pa (ASTM E331)

3.0 RESULTS

Table 1 – Summarized Test Results In Accordance with ASTM E283-04 Exova Specimen No.: 09-06-M0379		
ΔP Pa / PSF	Air Leakage Per Unit Perimeter (Crack) Length L/(s·m) / cfm/ft	Air Leakage Per Unit Area L/(s·m²) / cfm/ft²
25 / 0.52	0.000063 / 0.00004	0.0026 / 0.0005
50 / 1.05	0.000127 / 0.00008	0.0052 / 0.0010
75 / 1.57	0.000190 / 0.00012	0.0078 / 0.0015
100 / 2.09	0.000238 / 0.00015	0.0098 / 0.0019
150 / 3.14	0.000285 / 0.00018	0.0118 / 0.0023
250 / 5.23	0.000428 / 0.00028	0.0176 / 0.0035
300 / 6.27	0.000579 / 0.00037	0.0239 / 0.0047

Note: Prior to testing the actual specimen leakage, extraneous air leakage measurements were taken at successive pressures as per ASTM E283-04.

Table 2 – Summarized Water Penetration Test Results In Accordance with ASTM E331-00(2009) Exova Specimen No.: 09-06-M0379		
ΔP Pa / PSF	Spray Period Duration	Results
500 / 10.44	15-minutes	No water was observed to penetrate through the specimen or sealant
1000 / 20.89		No water was observed to penetrate through the specimen or sealant
5000 / 104.43*		No water was observed to penetrate through the specimen or sealant

* Testing was conducted after ASTM E330 Structural Performance at ±4854 Pa.

Table 3 – Summarized Structural Performance Test Results In Accordance with ASTM E330-02 (Procedure A) Exova Specimen No.: 09-06-M0379				
ΔP Pa / PSF	Upper Gauge Average Deflection During Load mm / in	Center Gauge Average Deflection During Load mm / in	Lower Gauge Average Deflection During Load mm / in	Net Deflection of Span mm / in
+500 / 10.44	0.2 / 0.008	0.0 / 0.000	0.2 / 0.008	-0.3 / -0.012
-500 / 10.44	-0.2 / -0.008	0.1 / 0.004	-0.2 / -0.008	0.3 / 0.012
+1213 / 25.33	-0.3 / -0.012	-0.1 / -0.004	-1.1 / -0.043	0.6 / 0.024
-1213 / 25.33	0.6 / 0.024	0.1 / 0.004	0.0 / 0.000	-0.2 / -0.008
+2730 / 57.02	-0.2 / -0.008	0.0 / 0.000	0.4 / 0.016	-0.1 / -0.004
-2730 / 57.02	0.0 / 0.000	0.0 / 0.000	-0.2 / -0.008	0.1 / 0.004
+4854 / 101.38	0.8 / 0.031	-0.1 / -0.004	0.1 / 0.004	-0.6 / -0.024
-4854 / 101.38	-0.6 / -0.024	0.1 / 0.004	0.0 / 0.000	0.5 / 0.020

Notes: '-' denotes exfiltration airflow direction (simulated negative wind loading)
 '+' denotes infiltration airflow direction (simulated positive wind loading)
 ΔP Equivalents: 500 Pa = 65 mph; 1213 Pa = 100 mph; 2730 Pa = 150 mph; 4854 Pa = 200 mph

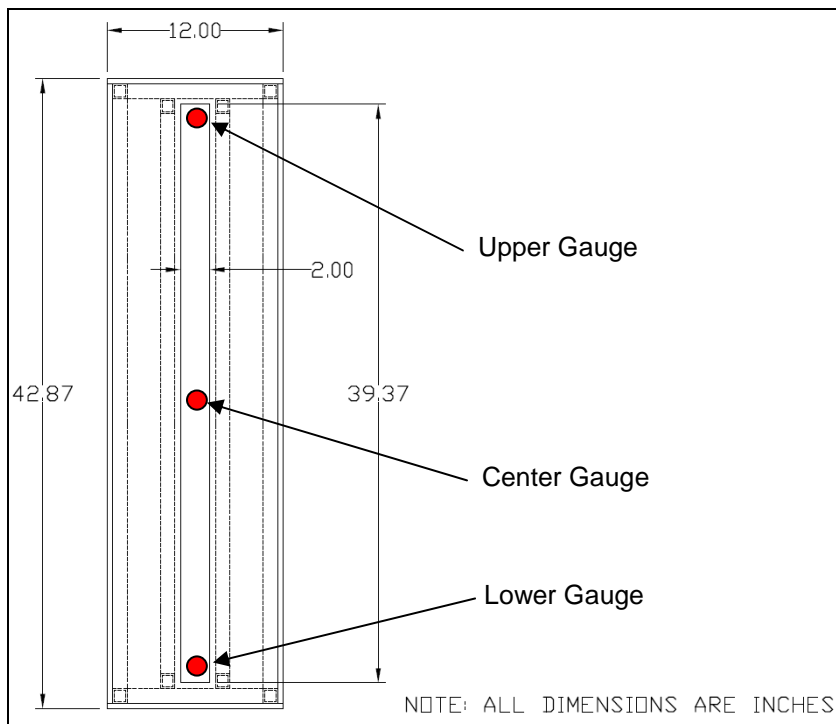



Figure 2 – Gauge Locations

Reported by:

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Project Manager, Systems Laboratory
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APPENDIX A

Specimen Photographs

Exova Specimen No.: 09-06-M0379

(4 Pages)



Figure A1 – Test Fixture Prior to Installation of Expansion Joint



Figure A2 – Cleaning Inside of Fixture Gap with Xylene Prior to Installation of Expansion Joint

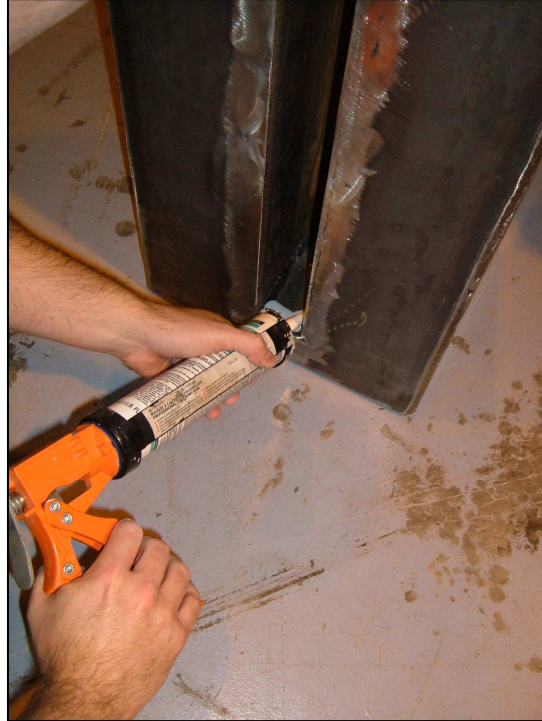


Figure A3 – Application of Dow Corning 790 Along Inside Perimeter of Gap



Figure A4 – Installation of Exova Specimen No.: 09-06-M0379 in Fixture



Figure A5 – Application of Dow Corning 790



Figure A6 – Completed Test Specimen



Figure A7 –Test Specimen Installed on Test Rig