



ASTM E 2357

Performance Test Results for Polyguard® Air Barrier Assembly

The ASTM E 2357 was developed to provide a uniform method to evaluate a full air barrier assembly. Until this test method was developed, one could only evaluate pieces of the assembly individually. The pieces consisted of air barrier material, flashing material and sealing materials. The method also incorporates wind loads that will push and pull on the air barrier assemblies, exposing weak areas that could leak air. This is a big advancement from previous methods used.

Reference Documents

ASTM E 283-04, Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across Specimen.

ASTM E 2357-05, Standard Test Method for Determining Air Leakage of Air Barrier Assemblies.

ASTM E 330-02, Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference.

Test Protocol: A series of laboratory tests were performed to determine air leakage resistance, wind load performance, and durability of air barrier building wrap with commercial installation techniques. The installations were tested for air leakage and structural performance testing using test methods listed above. The durability of the select installations was evaluated and re-testing for air leakage was performed.

Test Specimen Description: Two walls were constructed for this project. All walls measured 96" wide by 96" high.

The penetrated wall was constructed of 2 x 6 SPF studs spaced 16" on center and sheathed with nominal 1/2" Georgia-Pacific Densglass Gold. The sheathing was secured with #8 x 1 5/8" course drywall screws spaced 16" on center. The wall was coated with **Polyguard Liquid Air Barrier Vapor Permeable** with one 8 ft. horizontal and two 4 ft. vertical seams per ASTM E 2357. The penetrations included a 24" by 36" plywood blind window, a 4" by 4" HVAC duct, a 1-1/2" diameter plumbing pipe, brick ties, and two electrical box penetrations, one square and one octagon per ASTM E 2357. The interior of penetrations were filled with backer-rod and sealed with Sonneborn NP-1. The sheathing seams were sealed using a 4" wide **Polyguard 400**, aka **400 TWF** and **JT-40 Flashing Tape** at the exterior, overlapped in a perpendicular manner, then rolled flat with a hard surface rubber roller. The liquid air barrier at the exterior was roller applied in + or - 0.040" thick, and allowed to dry to + or - 0.020" thick. Wall ties were installed with the fasteners centered on vertical studs. The rectangular penetrations of the wall were sealed with 4" wide **Polyguard 400/400TWF/JT-40 Flashing Tape** at the exterior, overlapped in a perpendicular manner, then rolled flat with a hard surface rubber roller. The plumbing pipe and octagonal electrical box were sealed with a **Polyguard Wall Penetration Flashing Kit** sized for the penetration. The outside perimeter of the wall was sealed with 10" wide **Polyguard 400/400TWF/JT-40 Flashing Tape** at the exterior, overlapped in a perpendicular manner, then rolled flat with a hard surface rubber roller.

The control wall was constructed as the above penetration using the same application for the **Polyguard Liquid Air Barrier** but with no penetrations.

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This information is based on our best knowledge, but
POLYGUARD cannot guarantee the results to be obtained.



Test Results for the Penetration Wall:

ASTM E 2357 requirement is not to exceed 0.2L/(s•m²)@75Pa (0.04 cfm/ft² @ 1.57 psf)

Note: The low range measurement for the testing equipment employed was 0.1

Title of Test	Pressure	Air Infiltration	Air Exfiltration
Air Infiltration Phase I Before any wind load testing for base line	75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	100 Pa (2.09 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	150 Pa (3.13 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	250 Pa (5.22 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.1 L/s/m ² (0.02 cfm/ft ²)
	300 Pa (6.27 psf)	0.1 L/s/m ² (0.03 cfm/ft ²)	0.1 L/s/m ² (0.02 cfm/ft ²)

Title of Test	Pressure	Air Infiltration	Air Exfiltration
Air Infiltration Phase II After wind load testing	75 Pa (1.57 psf)	0.1 L/s/m ² (0.01 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	100 Pa (2.09 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	150 Pa (3.13 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.1 L/s/m ² (0.01 cfm/ft ²)
	250 Pa (5.22 psf)	0.1 L/s/m ² (0.02 cfm/ft ²)	0.1 L/s/m ² (0.02 cfm/ft ²)
	300 Pa (6.27 psf)	0.2 L/s/m ² (0.03 cfm/ft ²)	0.2 L/s/m ² (0.03 cfm/ft ²)

The results clearly show that **Polyguard Air Barrier Assembly** tested above the requirements for the ASTM E 2357. Results obtained are tested values and were secured by using the designated test methods. No conclusion of any kind regarding the adequacy or inadequacy of the glass in the test specimen can be made. Contact **Polyguard** if you are interested in a copy of the complete test.



Exterior Wall



Interior Wall

