Architectural Testing

CALIBRATION REPORT

Rendered to:

United States Aluminum Corp.

LOCATION: Waxahachie, Texas

Report No.: **79241.01-801-47**
Calibration Date: **12/14/07**
Report Date: **03/20/08**

2865 Market Loop
Southlake, Texas 76092
phone: 817-410-7202
fax: 817-424-8463
www.archtest.com

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Rendered to:

UNITED STATES ALUMINUM CORP.
200 Singleton Dr.
Waxahachie, TX 75165

Report No.:	79241.01-801-47
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General: At the request of United States Aluminum Corp., a representative of Architectural Testing, Inc. (ATI) witnessed air and water calibration procedures at their test facility in Waxahachie, Texas.

Air Flow Equipment:

1. Positive Displacement blower with a variable speed reversible motor
2. Meriam Instruments laminar flow element, (0-104 cfm Range))

Pressure Measuring Equipment:

1. Meriam inclined manometer, (0"-2")
2. Meriam inclined manometer, (0"-12")

Water Spray Equipment:

1. 144" by 96" spray rack grids with spray nozzles located 24" on center
2. Spray Systems water spray nozzles with 1/8" orifice
3. Water pressure gauge with pressure regulator

Test Methods:

Air Flow Calibration: ASTM E 283, *Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen.*

***Note**: The air flow determination was compared with the specified flow rate of calibrated orifice plates owned by Architectural Testing, Inc.*

Water Spray Calibration: ASTM E 331, *Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference*.

***Note**: A 2" 0" by 2" 0" catch box was mounted in front of the water spray system. Water was applied for a period of 5 minutes. The water which collected in the box was weighed and the flow rate was calculated.*

Results: The test equipment described above met the calibration requirements specified in the referenced ASTM test methods. All calibration test data sheets are included with this report.

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AIR FLOW CALIBRATION DATA

Date: 12/14/07
Technician: Jim Sturdevant
Witness: Terry Hopgood
Equipment: Test Lab Control Panel

Procedure: Install the orifice plate to be tested over the opening in the chamber and seal in place to eliminate perimeter leakage. The orifice plate shall be installed in the proper orientation. Mask off the orifice plate and determine the tare reading. After correcting for standard conditions and tare, the measured flow must be within ±5% of standard at flow rates above 2 cfm.

Airflow Correction Data:

Temperature: 70°F Barometric pressure: 30.19" of Hg Correction factor: 1.0035

Calibration Data				
Plate Diameter	**Measured Flow**	**Corrected Flow**	**Standard Flow**	**% Error***
1"	7.10 cfm	7.13 cfm	7.23 cfm	-1.47%
1-1/2"	16.29 cfm	16.35 cfm	16.80 cfm	-2.77%
2"	30.24 cfm	30.35 cfm	28.90 cfm	4.78%

***Note**: $\%\ error = \frac{Corrected\ Flow - Standard\ Flow}{Standard\ Flow} \times 100\%$

WATER CALIBRATION DATA SHEET

Date: 12/14/07
Technician: James Sturdevant
Witness: Terry Hopgood, US Aluminum

Location of Calibration Box: Top Right Quadrant

Water Pressure: 45 psi

Number of Spray Racks Used: 6 (total size calibrated 144" wide by 96" high)

Tare Weight of Containers:

#1 0.5 lbs
#2 0.5 lbs
#3 0.5 lbs
#4 0.5 lbs

Test Duration: 5 minutes

Calibration Test Run:

	Calibration Box Quadrant No.			
	#1	**#2**	**#3**	**#4**
Total Weight (lbs)	5.00	6.50	6.50	8.00
Tare Weight (lbs)	0.5	0.5	0.5	0.5
Net Weight (lbs)	4.50	6.00	6.00	7.50

Calculation of GPH: (7.202 x net weight)/test duration = gal/hr/ft^2

#1 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 4.50 \text{ lbs})/5 \text{ min.}$ = 6.48 gal/hr/ft^2. (must be 4-10)

#2 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 6.00 \text{ lbs})/5 \text{ min.}$ = 8.64 gal/hr/ft^2. (must be 4-10)

#3 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 6.00 \text{ lbs})/5 \text{ min.}$ = 8.64 gal/hr/ft^2. (must be 4-10)

#4 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 7.50 \text{ lbs})/5 \text{ min.}$ = 10.80 gal/hr/ft^2. (must be 4-10)

Total = 34.57 gal/hr/ft^2 (must be >20)

WATER CALIBRATION DATA SHEET

Date: 12/14/07
Technician: James Sturdevant
Witness: Terry Hopgood, US Aluminum

Location of Calibration Box: Center

Water Pressure: 45 psi

Number of Spray Racks Used: 6 (total size calibrated 144" wide by 96" high)

Tare Weight of Containers:

#1 0.5 lbs
#2 0.5 lbs
#3 0.5 lbs
#4 0.5 lbs

Test Duration: 5 minutes

Calibration Test Run:

	Calibration Box Quadrant No.			
	#1	**#2**	**#3**	**#4**
Total Weight (lbs)	3.50	4.00	8.00	6.00
Tare Weight (lbs)	0.5	0.5	0.5	0.5
Net Weight (lbs)	3.00	3.50	7.50	5.50

Calculation of GPH: (7.202 x net weight)/test duration = gal/hr/ft^2

#1 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}}$ x 3.00 lbs)/5 min. = 4.32 gal/hr/ft^2. (must be 4-10)

#2 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}}$ x 3.50 lbs)/5 min. = 5.04 gal/hr/ft^2. (must be 4-10)

#3 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}}$ x 7.50 lbs)/5 min. = 10.80 gal/hr/ft^2. (must be 4-10)

#4 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}}$ x 5.50 lbs)/5 min. = 7.92 gal/hr/ft^2. (must be 4-10)

Total = 28.09 gal/hr/ft^2 (must be >20)

WATER CALIBRATION DATA SHEET

Date: 12/14/07
Technician: James Sturdevant
Witness: Terry Hopgood, US Aluminum

Location of Calibration Box: Top Left Quadrant

Water Pressure: 45 psi

Number of Spray Racks Used: 6 (total size calibrated 144" wide by 96" high)

Tare Weight of Containers:

#1 0.5 lbs
#2 0.5 lbs
#3 0.5 lbs
#4 0.5 lbs

Test Duration: 5 minutes

Calibration Test Run:

	Calibration Box Quadrant No.			
	#1	**#2**	**#3**	**#4**
Total Weight (lbs)	5.00	5.50	4.00	8.00
Tare Weight (lbs)	0.5	0.5	0.5	0.5
Net Weight (lbs)	4.50	5.00	3.50	7.50

Calculation of GPH: (7.202 x net weight)/test duration = gal/hr/ft^2

#1 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 4.50 \text{ lbs})/5 \text{ min.}$ = 6.48 gal/hr/ft^2. (must be 4-10)

#2 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 5.00 \text{ lbs})/5 \text{ min.}$ = 7.20 gal/hr/ft^2. (must be 4-10)

#3 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 3.50 \text{ lbs})/5 \text{ min.}$ = 5.04 gal/hr/ft^2. (must be 4-10)

#4 = $(7.202 \frac{\text{gal - min.}}{\text{lbm - hr.}} \times 7.50 \text{ lbs})/5 \text{ min.}$ = 10.80 gal/hr/ft^2. (must be 4-10)

Total = 29.53 gal/hr/ft^2 (must be >20)

A copy of this report and equipment serial numbers will be retained by Architectural Testing, Inc. for a period of four years from the original calibration date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen(s) calibrated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Digitally Signed by: James F. Sturdevant

James Sturdevant
Technician

Digitally Signed for: Andy Cost by John H. Waskow

Andy Cost
Laboratory Manager

JS:hd
79241.02-801-47

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	03/20/08	N/A	Original report issue