PERFORMANCE TEST IN ACCORDANCE WITH AAMA 1503-09

UL CLEB	Submitted To:
Tested Report No. AT-00726	Aluminco S.A Thessi Megali Rachi Inofita, Viotia Greece 32011 Mr. Asterios Sakellaridis

Test Report Summary

Product Type: FIXD, Fixed
Model/Series: W4750 Series Aluminum Fixed Window
Overall Size: 47.2 in. x 59.1 in.
1200 mm x 1500 mm

Test Date: 12/19/18
Report Date: 01/18/19
Revision Date: N/A

Us: 2.21 W/m²K
(0.39 BTU/hr·ft²·°F)

Condensation Resistance of Glass, CRF_G	65
Condensation Resistance of Frame, CRF_F	76
Overall Condensation Resistance, CRF	65

Notes: Reference must be made to the complete UL CLEB report for test specimen description and details test results.

Tested By:

Frederic Currier
Laboratory Technician, Thermal Evaluation
UL CLEB

Approved By:

Dennis Anderson
Engineering Leader, NFRC IRC
UL CLEB

CHICAGO
US Headquarters
750 Anthony Trail
Northbrook, IL 60062
chicago@cleb.com

MONTREAL
Canada Headquarters
1320 Lionel-Boulet Blvd
Varennes, QC J3X 1P7
montreal@cleb.com

QUEBEC
420 Charest East Blvd
Suite 300
Quebec, QC G1K 8M4
quebec@cleb.com

OTTAWA
29 Capital Drive
Suite 200
Ottawa, ON K2G 0E7
ottawa@cleb.com

TRURO
64 Inglis Place
Suite 203
Truro, NS B2N 4B4
truro@cleb.com

NEW YORK
747 Third Avenue
2nd Floor
New York, NY 10017
newyork@cleb.com

T: 855.353.2532 W: ul.com/buildingenvelope

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1 INTRODUCTION

UL CLEB was retained by Aluminco S.A to perform a thermal transmittance and a condensation resistance test according to AAMA 1503-09 Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections Standard. The sample components and manufacturing are documented in section 2.0.

2 DESCRIPTION OF TESTED SPECIMEN

2.1 OPERATOR TYPE
FIXD, Fixed

2.2 OVERALL SIZE
1200 mm x 1500 mm (47.2 in. x 59.1 in.)

2.3 MODEL/SERIES
W4750 Series Aluminum Fixed Window

2.4 GLAZING DAYLIGHT OPENING
Lite Size 1: 1035 mm x 1336 mm (40.7" x 52.6")

Lite Size 2: N/A

2.5 TEST DATE
12/19/18

2.6 FRAME
2.6.1 Material: AT, Aluminum w/ Thermal breaks - All members

2.6.2 Finish: Anodized Aluminum

2.6.3 Joinery Type: Mechanical assembly, coped corner

2.6.4 Reinforcement:

Material	Location
None	
None	
None	

2.6.5 Weatherstripping

Type	Location
None	
None	
None	
None	

2.6.6 Drainage

Location	Qty	Shape and Dimension
None		
None		

2.7 SASH(ES)

2.7.1 Overall Sash Sizes:
Sash 1: N/A
Sash 2: N/A

2.7.2 Material: N/A

2.7.3 Finish: N/A

2.7.4 Joinery Type: N/A

2.7.5 Reinforcement:

Material	Location
None	
None	
None	

2.7.6 Weatherstripping

Type	Location
None	
None	
None	

2.7.7 Drainage

Location	Qty	Shape and Dimension
None		
None		

2.7.8 Hardware

Item	Location	Quantity
None		
None		
None		
None		
None		

2.7.9 Glazing Method

Exterior	EPDM Gasket
Interior	EPDM Gasket

2.7.10 Spacer

Name (Code)	Primary Seal	Secondary Seal
A1-D	Unverfied	Unverfied

2.7.11 Glazing System

Type: Double Sealed Unit
Overall Thickness: 26.2 mm (1.03 in.)
*Filling Technque: N/A
*Design Gas Fill: Unverified
Capillary Tube: No

*: Data obtained by the manufacturer
S = Surface of LowE Coating(s)

	Thickness		*LowE Coating Emissivity							
	mm	in.	S1	S2	S3	S4	S5	S6	S7	S8
Glass 1	5.9	0.232		Unk.						
****Glass 2**	8.3	0.327								
Glass 3										
Glass 4										
Gap 1	12	0.472								
Gap 2										
Gap 3										

** Note: Glass 2 is a laminate
Unk. = LowE coating emissivity unknown

3 SPECIMEN PREPARATION PRIOR TO TEST

The test specimen was preconditioned at ambient laboratory conditions prior to the test. The surround panel-to-specimen interfaces were sealed with a non-reflective tape. The specimen was sealed on the exterior with a non-reflective tape or caulk.

4 TEST PARAMETERS

Tests to determine the Standardized Thermal Transmittance (Ust) of the specimen were performed in the guarded hot box located in Varennes. The most recent calibration of the hot box apparatus was December 1, 2018.

4 TEST PARAMETERS (Continued)

The thermal performance evaluations were completed in accordance with testing procedure outlined in AAMA 1503-09 Standard. Test Procedure using a dynamic wind perpendicular to the specimen on the weather side and simulated natural convection on the room side. A zero static pressure differential was maintained across the specimen during the test by pressurizing the guard box on the room side.

Data was collected in accordance with section 9.2.7 of the AAMA 1503-09 Test Procedure. A thermal stabilization period during four hour is necessary before the two hour evaluation period.

5 RESULTS

5.1 MEASURED TEST DATA

Metric (Imperial)

5.1.1 Glazing Deflection

	Lite 1 (mm)	Lite 2 (mm)
Deflection Before Test	0.0	N/A
Effective Gap Width During Test	11	N/A

5.1.2 Heat Flows

Total Measured Input into Metering Box (Q)	239.8 W (818.3 BTU/hr)
Surround Panel Heat Flow (Qsp)	88.7 W (302.5 BTU/hr)
Metering Box Heat Flow (Qmb)	4.6 W (15.7 BTU/hr)
Net Specimen Heat Loss (Qs)	155.8 W (531.4 BTU/hr)

5.1.3 Areas

Test Specimen Projected Area (As)	1.8 m² (19.4 ft²)
Metering Box Opening Area (Amb)	13.38 m² (144.0 ft²)
Metering Box Baffle Area (Ab1)	11.6 m² (124.6 ft²)
Surround Panel Area (Asp)	12.6 m² (136.0 ft²)

5.1.4 Test Conditions

Average Metering Room Air Temperature (tI)	20.9 °C (69.6 °F)
Average Cold Side Air Temperature (tII)	-18.0 °C (-0.5 °F)
Average Guard Air Temperature	21.7 °C (71.0 °F)
Metering Room Maximum Relative Humidity	15 %

5.1.5 Surface Temperature Data

Surround Panel Warm Room Surface Temperature	19.3 °C (66.8 °F)
Surround Panel Cold Side Surface Temperature*	-4.7 °C (23.6 °F)

*Measured 100mm(4") from surface

Average Temperature of 14 Predetemined Frame Locations (FTp)	11.6 °C (52.8 °F)
Average Temperature of 4 Coldest Roving Frame Surfaces (FTr)	8.3 °C (47.0 °F)
Average Glazing Temperature (GT)	7.3 °C (45.1 °F)

6 CALCULATED TEST DATA

6.1 Thermal Transmittance of Test Specimen (Us) 2.21 W/m²K (0.39 BTU/hr·ft²·°F)

6.2 Condensation Resistance Factor Calculations

Frame Weighting Factor (W)	0.05
Weighted Frame Temperature (FT)	11.4 °C (52.5 °F)
CRF of glass (CRF_G)	65
CRF of frame (CRF_F)	76
CRF of Test Specimen (CRF)	65

6.3 Test Duration

The environmental systems were started at:	2:10 PM	on	December 18, 2018
The test parameters were considered stable for two consecutive two hours test periods on:	5:19:00 AM	on	December 19, 2018
The thermal performance test results were derived from:	9:19:00 AM	on	December 19, 2018

7 GENERAL COMMENTS

8 CONCLUSIONS

This test method does not include procedures to determine the heat flow due to either air movement through the specimen or solar radiation effects. As a consequence, the thermal transmittance results obtained do not reflect performances which may be expected from field installations due to not accounting for solar radiation, air leakage effects, and the thermal bridge effects that may occur due to the specific design and construction of the fenestration system opening. Therefore, it should be recognized that the thermal transmittance results obtained from this test method are for ideal laboratory conditions and should only be used for fenestration product comparisons and as input to thermal performance analyses which also include solar, air leakage, and thermal bridge effects.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report, representative sections of the test specimen and report will be retained by UL CLEB for a period of 5 years. Testing described in this report was conducted in accordance with the testing procedure outlined in AAMA 1503-09.

Appendix 1 of this report lists the measured surface temperature data and a rendered AAMA drawing indicating surface thermocouple measurement locations.

9 REVISION LOG

Revision Number	Revision Date	Description

APPENDIX 1 – TEST SPECIMEN WARM SIDE SURFACE TEMPERATURES

TC#	ºC	ºF
1	9.9	49.9
2	6.4	43.6
3	11.5	52.8
4	13.3	56.0
5	14.1	57.4
6	10.9	51.6
7	11.5	52.8
8	13.9	57.0
9	9.4	48.9
10	10.0	49.9
11	9.6	49.2
12	7.7	45.8
13	7.5	45.4
14	9.5	49.1
15	4.3	39.7
16	10.6	51.1
17	6.1	42.9
18	6.8	44.3
19	12.4	54.4
20	6.8	44.2

Roving Temperatures

21	6.5	43.7
22	6.6	43.8
23	6.7	44.0
24	6.8	44.2