



## PERFORMANCE TEST IN ACCORDANCE WITH AAMA 1503-09

UL CLEB	Submitted To:
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Tested Report No.  
AT-00725

Aluminco S.A  
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Mr. Asterios Sakellaridis

### Test Report Summary

Product Type: CSSV, Casement  
Model/Series: W4750 Series Aluminum Casement Window  
Overall Size: 23.6 in. x 59.1 in.  
600 mm x 1500 mm

Test Date: 12/15/18  
Report Date: 01/18/19  
Revision Date: N/A

Us: 2.50 W/m<sup>2</sup>K  
(0.44 BTU/hr·ft<sup>2</sup>·°F)

Condensation Resistance of Glass, CRF<sub>G</sub> 67

Condensation Resistance of Frame, CRF<sub>F</sub> 73

Overall Condensation Resistance, CRF 67

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

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**Appendix 1: Test Specimen Warm Side Surface Temperatures**

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## 1 INTRODUCTION

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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

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2.1 OPERATOR TYPE  
CSSV, Casement

2.2 OVERALL SIZE  
600 mm x 1500 mm (23.6 in. x 59.1 in.)

2.3 MODEL/SERIES  
W4750 Series Aluminum Casement Window

2.4 GLAZING DAYLIGHT OPENING  
Lite Size 1: 370 mm x 1270 mm (14.6" x 50")

Lite Size 2: N/A

2.5 TEST DATE  
12/15/18

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:

<u>Material</u>	<u>Location</u>
None	
None	
None	

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2.6.5 Weatherstripping

<u>Type</u>	<u>Location</u>
EPDM Gasket	All Perimeter
None	
None	
None	

2.6.6 Drainage

<u>Location</u>	<u>Qty</u>	<u>Shape and Dimension</u>
None		
None		

2.7 SASH(ES)

2.7.1 Overall Sash Sizes:

Sash 1: 500 mm x 1400 mm (19.7" x 55.1")

Sash 2: NA

2.7.2 Material: AT, Aluminum w/ Thermal breaks - All members

2.7.3 Finish: Anodized Aluminum

2.7.4 Joinery Type: Mechanical assembly crimped

2.7.5 Reinforcement:

<u>Material</u>	<u>Location</u>
None	
None	
None	

2.7.6 Weatherstripping

<u>Type</u>	<u>Location</u>
EPDM Gasket	All Perimeter
None	
None	

2.7.7 Drainage

<u>Location</u>	<u>Qty</u>	<u>Shape and Dimension</u>
None		
None		

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2.7.8 Hardware

Item	Location	Quantity
Sash Lock Release Handle	Door Lock Stile	1
Dual-Arm Hinge	Head & Sill	2
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	Unverified	Unverified

2.7.11 Glazing System

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

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

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

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

**3 SPECIMEN PREPARATION PRIOR TO TEST**

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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**

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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.

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## 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)

		Lite 1 (mm)	Lite 2 (mm)
5.1.1	Glazing Deflection		
	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)		174.9 W (596.6 BTU/hr)
	Surround Panel Heat Flow (Qsp)		94.2 W (321.3 BTU/hr)
	Metering Box Heat Flow (Qmb)		6.8 W (23.2 BTU/hr)
	Net Specimen Heat Loss (Qs)		87.5 W (298.5 BTU/hr)
5.1.3	Areas		
	Test Specimen Projected Area (As)		0.9 m <sup>2</sup> (9.7 ft <sup>2</sup> )
	Metering Box Opening Area (Amb)		13.38 m <sup>2</sup> (144.0 ft <sup>2</sup> )
	Metering Box Baffle Area (Ab1)		12.5 m <sup>2</sup> (134.3 ft <sup>2</sup> )
	Surround Panel Area (Asp)		12.6 m <sup>2</sup> (136.0 ft <sup>2</sup> )
5.1.4	Test Conditions		
	Average Metering Room Air Temperature (tl)		20.8 °C (69.4 °F)
	Average Cold Side Air Temperature (tll)		-18.0 °C (-0.4 °F)
	Average Guard Air Temperature		21.7 °C (71.0 °F)
	Metering Room Maximum Relative Humidity		10 %

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5.1.5	Surface Temperature Data	
	Surround Panel Warm Room Surface Temperature	19.4 °C (66.9 °F)
	Surround Panel Cold Side Surface Temperature*	-4.3 °C (24.3 °F)
		*Measured 100mm(4") from surface
	Average Temperature of 14 Predetermined Frame Locations (FTp)	10.4 °C (50.7 °F)
	Average Temperature of 4 Coldest Roving Frame Surfaces (FTr)	6.6 °C (43.9 °F)
	Average Glazing Temperature (GT)	7.8 °C (46.1 °F)

## 6 CALCULATED TEST DATA

6.1	Thermal Transmittance of Test Specimen (Us)	2.50 W/m <sup>2</sup> K (0.44 BTU/hr-ft <sup>2</sup> ·°F)
6.2	<u>Condensation Resistance Factor Calculations</u>	
	Frame Weighting Factor (W)	0.07
	Weighted Frame Temperature (FT)	10.2 °C (50.3 °F)
	CRF of glass (CRF <sub>G</sub> )	67
	CRF of frame (CRF <sub>F</sub> )	73
	CRF of Test Specimen (CRF)	67
6.3	Test Duration	
	The environmental systems were started at:	12:07 PM on December 14, 2018
	The test parameters were considered stable for two consecutive two hours test periods on:	4:07:00 AM on December 15, 2018
	The thermal performance test results were derived from:	8:07:00 AM on December 15, 2018

## 7 GENERAL COMMENTS

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## 8 CONCLUSIONS

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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.

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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

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<u>Revision Number</u>	<u>Revision Date</u>	<u>Description</u>
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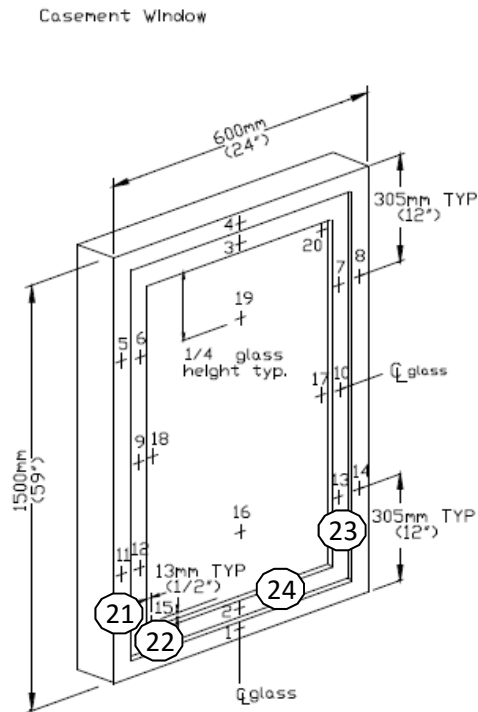


**APPENDIX 1 – TEST SPECIMEN WARM SIDE SURFACE TEMPERATURES**

TC#	°C	°F
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



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