

**AAMA 1503-09 THERMAL PERFORMANCE
TEST REPORT**

Rendered to:

GAMCO CORPORATION

SERIES/MODEL: W250C Awning

TYPE: Projecting (Awning)

Summary of Results		
Thermal Transmittance (U-Factor)		0.48
Condensation Resistance Factor - Frame (CRF _f)		56
Condensation Resistance Factor - Glass (CRF _g)		63
Unit Size:	59" x 23-5/8"	
Layer 1:	1/4"	Clear
Gap 1:	0.53"	A1-D: Aluminum Spacer 90% Argon*
Layer 2:	1/4"	PPG Solarban 60 (e=0.035*, #3)

Reference must be made to Report No. E5507.01-116-46.

AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

GAMCO CORPORATION
131-10 Maple Avenue
Flushing , New York 11355

Test Sample Identification:**Series/Model:** W250C Awning**Type:** Projecting (Awning)**Test Sample Submitted by:** Client

Test Procedure: The condensation resistance factor (CRF) and thermal transmittance (U) were determined in accordance with AAMA 1503-09, *Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections*

- | | |
|---|---------|
| 1. Average warm side ambient temperature | 69.80 F |
| 2. Average cold side ambient temperature | -0.42 F |
| 3. 15 mph dynamic wind applied to test specimen exterior. | |
| 4. 0.0" \pm 0.04" static pressure drop across specimen. | |

Test Results Summary:

- | | |
|--|------|
| 1. Condensation resistance factor - Frame (CRF _f) | 56 |
| Condensation resistance factor - Glass (CRF _g) | 63 |
| 2. Thermal transmittance due to conduction (U)
(U-factors expressed in Btu/hr·ft ² ·F) | 0.48 |

Test Sample Description:

Frame:

Material:	AU (0.18"): Aluminum with Thermal Improvement - All Members		
Size:	59" x 23-5/8"		
Daylight Opening:	N/A	Glazing Method:	N/A
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Mitered / Keys & Stakes / Sealed		

Vent:

Material:	AU (0.18"): Aluminum with Thermal Improvement - All Members		
Size:	57-1/4" x 21-7/8"		
Daylight Opening:	52-1/4" x 16-7/8"	Glazing Method:	Interior
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Mitered / Keys & Stakes / Sealed		

Glazing Information:

Layer 1:	1/4"	Clear	
Gap 1:	0.53"	A1-D: Aluminum Spacer	90% Argon*
Layer 2:	1/4"	PPG Solarban 60 (e=0.035*, #3)	
Gas Fill Method:	Single-Probe Method*		
Desiccant:	Yes		

**Stated per Client/Manufacturer*

N/A Non-Applicable

Test Sample Description: (Continued)**Weatherstripping:**

Description	Quantity	Location
Flexible hollow bulb gasket	1 row	Frame and vent perimeter
EPDM wedge gasket	1 row	Interior glazing perimeter

Hardware:

Description	Quantity	Location
1/4 Turn lever lock handle	2	Bottom rail
Metal keeper	2	Sill
Multi-arm hinge	2	Jambs/stiles
Metal snubber set	1 set	Head/top rail

Drainage:

Drainage Method	Size	Quantity	Location
Weep notch	0.88" x 0.13"	2	Sill

Test Duration:

1. The environmental systems were started at 15:29 hours, 04/20/15.
2. The thermal performance test results were derived from 02:05 hours, 04/21/15 to 06:05 hours, 04/21/15.

Condensation Resistance Factor (CRF):

The following information, condensed from the test data, was used to determine the condensation resistance factor:

T_h	=	Warm side ambient air temperature	69.80 F
T_c	=	Cold side ambient air temperature	-0.42 F
FT_p	=	Average of pre-specified frame temperatures (14)	39.05 F
FT_r	=	Average of roving thermocouples (4)	35.78 F
W	=	$[(FT_p - FT_r) / (FT_p - (T_c + 10))] \times 0.40$	0.044
FT	=	$FT_p(1-W) + W (FT_r) =$ Frame Temperature	38.91 F
GT	=	Glass Temperature	43.98 F
CRF_g	=	Condensation resistance factor – Glass	63
		$CRF_g = (GT - T_c) / (T_h - T_c) \times 100$	
CRF_f	=	Condensation resistance factor – Frame	56
		$CRF_f = (FT - T_c) / (T_h - T_c) \times 100$	

The CRF number was determined to be 56 (on the size as reported). When reviewing this test data, it should be noted that the frame temperature (FT) was colder than the glass temperature (GT) therefore controlling the CRF number. Refer to the 'CRF Report' page and the 'Thermocouple Location Diagram' page of this report.

Thermal Transmittance (U_c):

T_h	= Average warm side ambient temperature	69.80 F
T_c	= Average cold side ambient temperature	-0.42 F
P	= Static pressure difference across test specimen	0.00 psf
	15 mph dynamic perpendicular wind at exterior	
	Nominal sample area	9.68 ft ²
	Total measured input to calorimeter	507.33 Btu/hr
	Calorimeter correction	181.08 Btu/hr
	Net specimen heat loss	326.25 Btu/hr
U	= Thermal Transmittance	0.48 Btu/hr·ft ² ·F

Glazing Deflection:

	Vent
Edge Gap Width	0.53"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.53"
Center gap width at laboratory ambient conditions on day of testing	0.53"
Center gap width at test conditions	0.47"

The sample was inspected for the formation of frost or condensation, which may influence the surface temperature measurements. The sample showed no evidence of condensation/frost at the conclusion of the test.

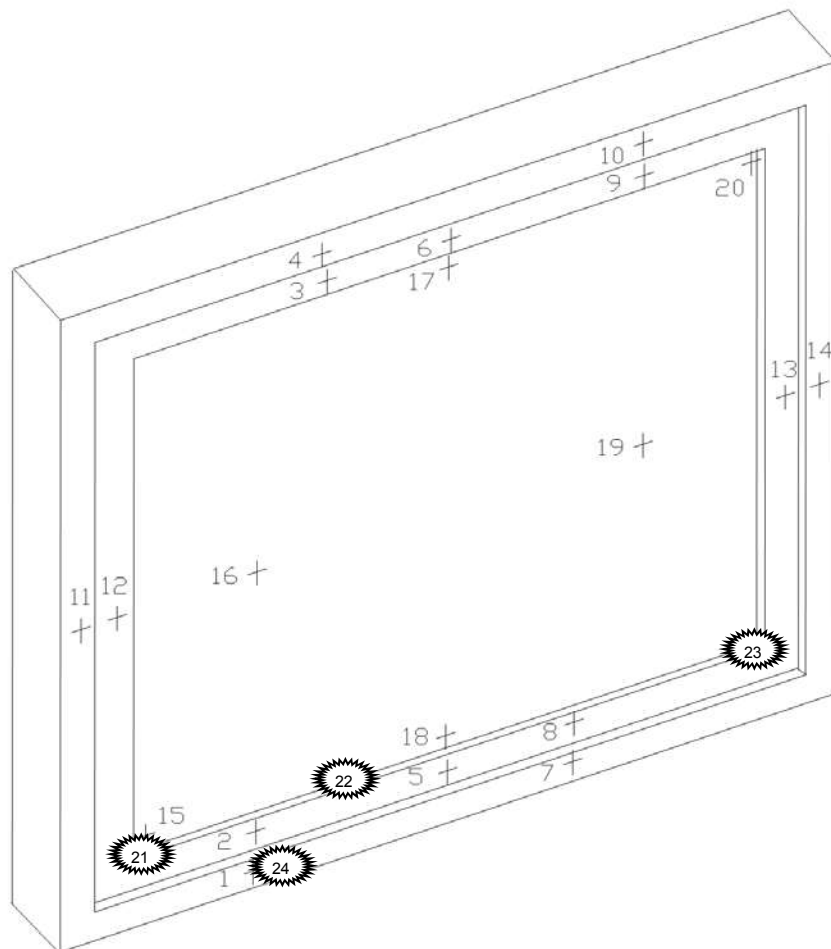
Prior to testing the specimen was sealed with silicone on the interior side and checked for air infiltration per Section 9.3.4.

Required annual calibrations for the Architectural Testing Inc. 'thermal test chamber' (ICN 000001) in York, Pennsylvania were last conducted in May 2014 in accordance with Architectural Testing Inc. calibration procedure. A CTS Calibration verification was performed December 2014. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed December 2014.





CRF Report

Time:	04:04	04:34	05:04	05:34	06:05	AVERAGE
Pre-specified Thermocouples - Frame						
1	36.42	36.41	36.36	36.36	36.35	36.38
2	36.65	36.68	36.65	36.61	36.57	36.63
3	38.12	38.10	38.09	38.03	38.05	38.08
4	42.81	42.84	42.82	42.78	42.81	42.81
5	36.53	36.52	36.50	36.50	36.49	36.51
6	39.38	39.32	39.40	39.38	39.38	39.37
7	38.52	38.53	38.54	38.45	38.42	38.49
8	38.00	37.99	38.03	37.95	37.91	37.98
9	39.93	39.94	39.97	39.92	39.97	39.95
10	42.80	42.80	42.81	42.79	42.84	42.81
11	40.45	40.43	40.44	40.39	40.43	40.43
12	37.62	37.64	37.66	37.60	37.61	37.63
13	38.48	38.47	38.42	38.40	38.39	38.43
14	41.24	41.26	41.27	41.20	41.21	41.24
FT _p	39.07	39.07	39.07	39.03	39.03	39.05
Pre-specified Thermocouples - Glass						
15	30.46	30.50	30.47	30.43	30.43	30.46
16	55.60	55.60	55.53	55.44	55.55	55.55
17	43.27	43.27	43.28	43.25	43.21	43.26
18	37.05	37.04	37.01	36.99	37.02	37.02
19	58.29	58.32	58.35	58.29	58.21	58.29
20	39.28	39.27	39.33	39.33	39.32	39.31
GT	43.99	44.00	44.00	43.96	43.96	43.98
Cold Point (Roving) Thermocouples						
21	34.70	34.70	34.70	34.70	34.70	34.70
22	35.90	35.90	35.90	35.90	35.90	35.90
23	36.10	36.10	36.10	36.10	36.10	36.10
24	36.40	36.40	36.40	36.40	36.40	36.40
FT _R	35.78	35.78	35.78	35.78	35.78	35.78
W	0.04	0.04	0.04	0.04	0.04	0.04
FT	38.92	38.92	38.92	38.88	38.89	38.91
Warm Side - Room Ambient Air Temperature						
	69.80	69.81	69.80	69.81	69.80	69.80
Cold Side - Room Ambient Air Temperature						
	-0.42	-0.41	-0.42	-0.39	-0.40	-0.41
CRF _f	56	56	56	56	56	56
CRF _g	63	63	63	63	63	63

Thermocouple Location Diagram



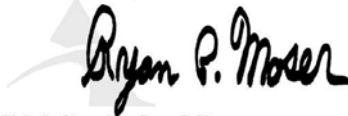
Cold Point Locations

-  21. 34.70
-  22. 35.90
-  23. 36.10
-  24. 36.40

Architectural Testing, Inc. will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Architectural Testing, Inc. for the entire test record retention period. The test record retention end date for this report is April 21, 2019.

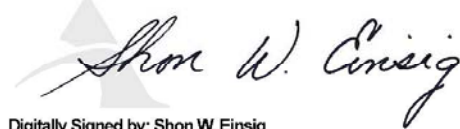
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For ARCHITECTURAL TESTING, INC.



Digitally Signed by: Ryan P. Moser

Ryan P. Moser
Senior Technician




Digitally Signed by: Shon W. Einsig

Shon W. Einsig
Senior Technician
Individual-In-Responsible-Charge

RPM:klb
E5507.01-116-46

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Drawings (6)

	<p>Architectural Testing, Inc. is accredited by the International Accreditation Service (IAS) under the specific test methods listed under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS.</p>
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.01R0	04/23/15	All	Original Report Issue. Work requested by Howard Nguyen of Gamco Corporation