Architectural Testing

AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

US ALUMINUM

SERIES/MODEL: 601 Top Notch Ribbon Wall SSG
TYPE: Glazed Wall Systems (Site-built)

Summary of Results			
Thermal Transmittance (U-Factor)			0.43
Condensation Resistance Factor - Frame (CRF_f)			78
Condensation Resistance Factor - Glass (CRF_g)			66
Unit Size:		79" x 79"	
Layer 1:	1/4"	AGC TiAC36 LowE (e=0.034*, #2)	
Gap 1:	0.50"	OF-S: Super Spacer Standard	100% Air*
Layer 2:	1/4"	Clear	

Reference must be made to Report No. B6097.01-201-46, dated 12/06/12 for complete test specimen description and data.

849 Western Avenue North
St. Paul, MN 55117
phone: 651-636-3835
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www.archtest.com

Architectural Testing

AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

US ALUMINUM
200 Singleton Drive
Waxahachie, Texas 75165

Report Number:	B6097.01-201-46
Test Date:	11/28/12
Report Date:	12/06/12
Test Record Retention End Date:	11/28/16

Test Sample Identification:

Series/Model: 601 Top Notch Ribbon Wall SSG

Type: Glazed Wall Systems (Site-built)

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	-0.40 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)	78
Condensation resistance factor - Glass (CRF_g)	66
2. Thermal transmittance due to conduction (U)	0.43
(U-factors expressed in Btu/hr·ft^2·F)	

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Test Sample Description:

Frame:

Material:	AT (0.22"): Aluminum with Thermal Breaks - All Members		
Size:	79" x 79"		
Daylight Opening:	36-3/4" x 74-1/4" (x2)	**Glazing Method:**	Interior
Exterior Color:	White	**Exterior Finish:**	Paint
Interior Color:	White	**Interior Finish:**	Paint
Corner Joinery:	Butted / Screws / Sealed		

Glazing Information:

Layer 1:	1/4"	AGC TiAC36 LowE (e=0.034*, #2)	
Gap 1:	0.50"	OF-S: Super Spacer Standard	100% Air*
Layer 2:	1/4"	Clear	
Gas Fill Method:		N/A*	
Desiccant:		Yes	

**Stated per Client/Manufacturer*
N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
No weatherstrip		

Hardware:

Description	Quantity	Location
No hardware		

Drainage:

Description	Size	Quantity	Location
No visible weeps			

Test Duration:

1. The environmental systems were started at 12:00 hours, 11/27/12.

2. The thermal performance test results were derived from 03:47 hours, 11/28/12 to 07:47 hours, 11/28/12.

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	-0.40 F
FT_p	=	Average of pre-specified frame temperatures (14)	55.20 F
FT_r	=	Average of roving thermocouples (4)	45.68 F
W	=	$[(FT_p - FT_r) / (FT_p - (T_c + 10))] \times 0.40$	0.083
FT	=	$FT_p(1-W) + W (FT_r)$ = Frame Temperature	54.40 F
GT	=	Glass Temperature	45.96 F
CRF_g	=	Condensation resistance factor – Glass	66
		$CRF_g = (GT - T_c) / (T_h - T_c) \times 100$	
CRF_f	=	Condensation resistance factor – Frame	78
		$CRF_f = (FT - T_c) / (T_h - T_c) \times 100$	

The CRF number was determined to be 66 (on the size as reported). When reviewing this test data, it should be noted that the glass temperature (GT) was colder than the frame temperature (FT) 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	-0.40	F
P	=	Static pressure difference across test specimen 15 mph dynamic perpendicular wind at exterior	0.00	psf
Nominal sample area			43.34	ft^2
Total measured input to calorimeter			1426.69	Btu/hr
Calorimeter correction			120.07	Btu/hr
Net specimen heat loss			1306.63	Btu/hr
U	=	Thermal Transmittance	0.43	$Btu/hr \cdot ft^2 \cdot F$

Glazing Deflection:

	Left Glazing	Right Glazing
Edge Gap Width	0.50"	0.50"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.32"	0.38"
Center gap width at laboratory ambient conditions on day of testing	0.32"	0.38"
Center gap width at test conditions	0.22"	0.32"

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.

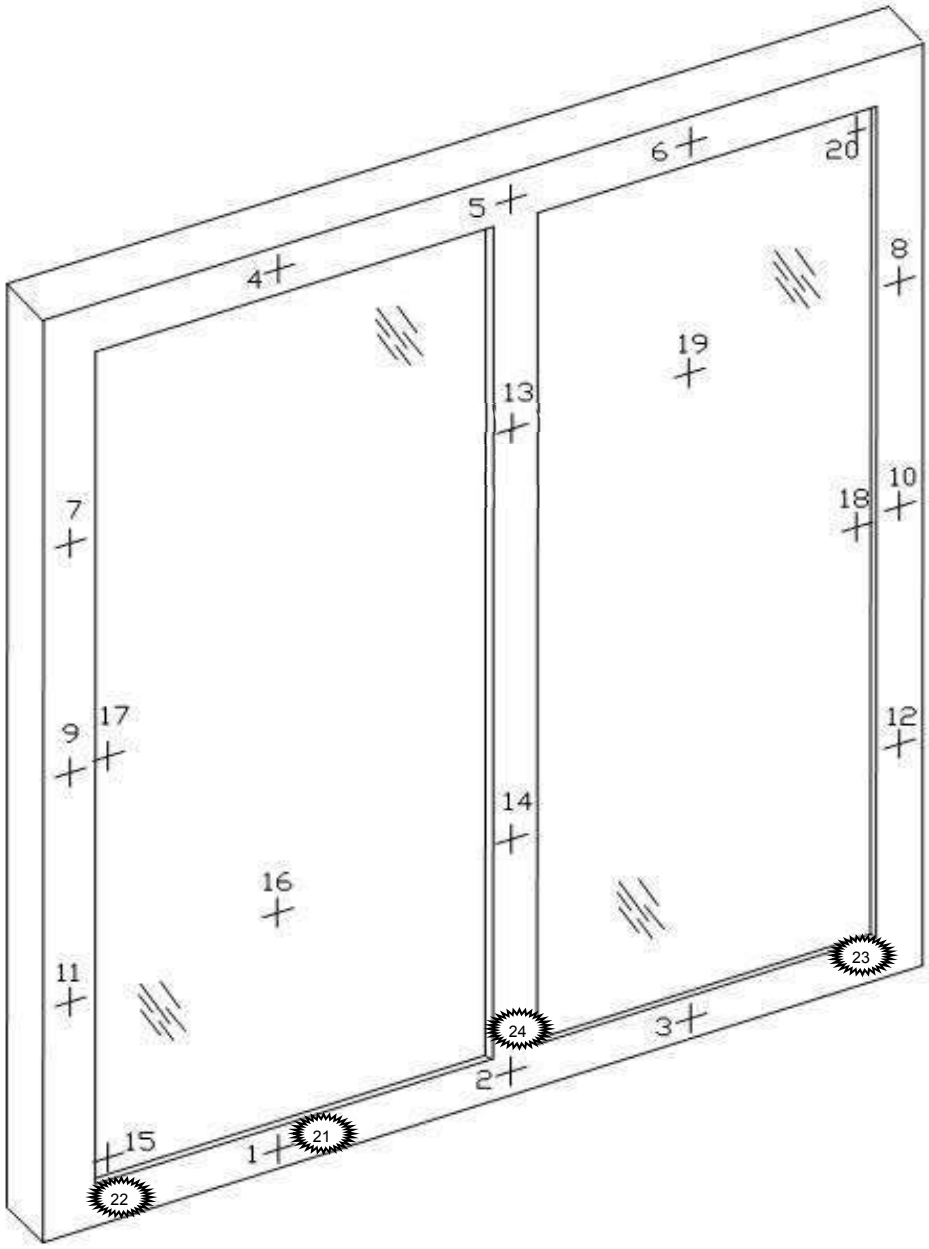
Prior to testing the specimen was sealed with silicone on the interior side and checked for air infiltration per Section 9.3.4.

Required annual calibrations for the Architectural Testing Inc. 'thermal test chamber' (ICN N000235) in St. Paul, Minnesota were last conducted in September 2012 in accordance with Architectural Testing Inc. calibration procedure. A CTS Calibration verification was performed November 2012. A Metering Box Wall Transducer and Surround Panel Flanking Loss Characterization was performed September 2012.

CRF Report

Time:	05:47	06:17	06:47	07:17	07:47	AVERAGE
Pre-specified Thermocouples - Frame						
1	47.22	47.22	47.30	47.21	47.29	47.25
2	50.12	50.16	50.14	50.15	50.16	50.15
3	49.24	49.18	49.21	49.24	49.24	49.22
4	55.42	55.39	55.42	55.45	55.45	55.42
5	58.74	58.73	58.75	58.74	58.75	58.74
6	56.47	56.46	56.51	56.55	56.52	56.50
7	51.90	51.88	51.92	51.95	51.94	51.92
8	61.21	61.26	61.25	61.28	61.27	61.26
9	52.74	52.68	52.69	52.73	52.71	52.71
10	59.17	59.13	59.19	59.20	59.21	59.18
11	51.95	51.86	51.93	51.95	51.95	51.93
12	57.74	57.71	57.77	57.79	57.86	57.77
13	60.91	60.90	60.92	60.92	60.93	60.91
14	59.74	59.76	59.80	59.77	59.78	59.77
FT_P	55.18	55.17	55.20	55.21	55.22	55.20
Pre-specified Thermocouples - Glass						
15	31.81	31.82	31.83	31.86	31.96	31.86
16	51.18	51.16	51.21	51.17	51.18	51.18
17	48.04	48.06	48.07	48.10	48.09	48.07
18	49.19	49.18	49.23	49.25	49.25	49.22
19	45.93	45.96	45.94	45.98	46.01	45.96
20	49.46	49.46	49.49	49.55	49.50	49.49
GT	45.93	45.94	45.96	45.98	46.00	45.96
Cold Point (Roving) Thermocouples						
21	47.22	47.22	47.30	47.21	47.29	47.25
22	39.19	39.18	39.25	39.28	39.28	39.24
23	48.70	48.70	48.69	48.70	48.70	48.70
24	47.55	47.55	47.53	47.55	47.59	47.55
FT_R	45.67	45.66	45.69	45.69	45.71	45.68
W	0.08	0.08	0.08	0.08	0.08	0.08
FT	54.39	54.37	54.41	54.41	54.42	54.40
Warm Side - Room Ambient Air Temperature						
	69.78	69.80	69.81	69.81	69.83	69.81
Cold Side - Room Ambient Air Temperature						
	-0.47	-0.36	-0.42	-0.41	-0.32	-0.40
CRF_f	78	78	78	78	78	78
CRF_g	66	66	66	66	66	66

Thermocouple Location Diagram

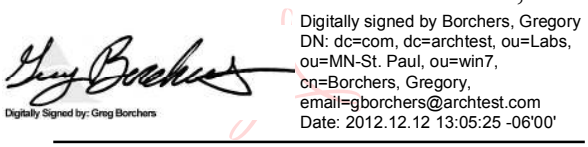


Cold Point Locations

21. 47.25
22. 39.24
23. 48.70
24. 47.55

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period such materials shall be discarded without notice and the service life of this report by Architectural Testing 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) tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.



Greg S Borchers
Technician

Michael P. Resech
Manager - Simulations and Thermal Testing
Individual-In-Responsible-Charge

GSB:mpr
B6097.01-201-46

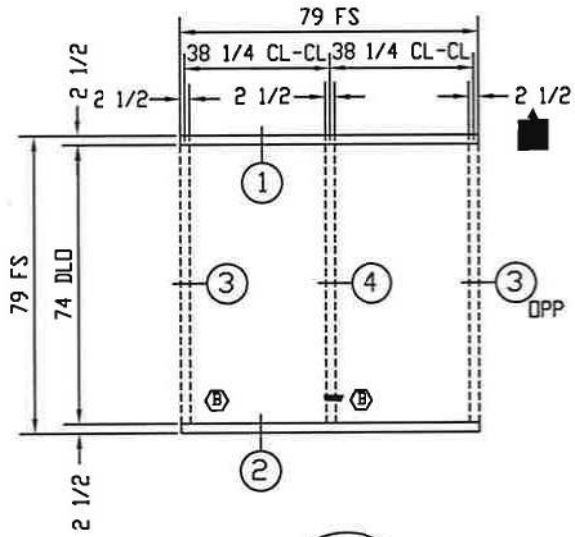
Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Drawings (9)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
01-R0	12/06/12	All	Original Report Issue. Work requested by Don Willard of US Aluminum.

Appendix A: Drawings

MU2011-002-01



B

QTY = 1

SSG

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# B6097

Date 12/5/12 Tech HG

SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
(B)	37.875 X 74.875	2	1 INS = INSULATED GLASS

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

CRL
2100 E. 38TH STREET VERNON, CA 90058
PHONE (323) 588-1281 FAX (323) 232-2523
DIVISION UNITED STATES ALUMINUM

DRWN BY: DCW

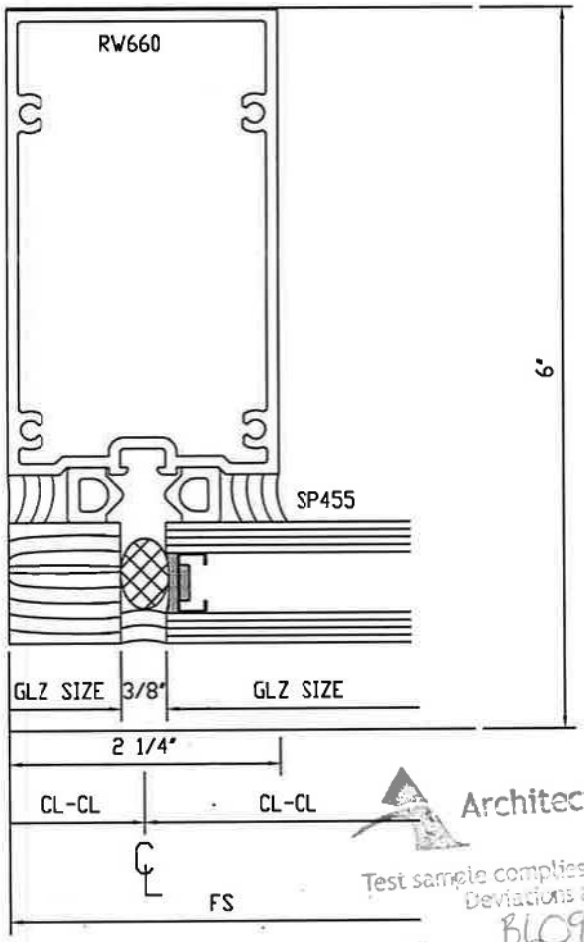
DATE: 12/20/2011

SCALE: 3/8"=1"

THERMAL_TEST_NFRC_AAMA_1503
SERIES_TT601_SSG

DWG NO.
MU2011-002-01

MU2011-002-03



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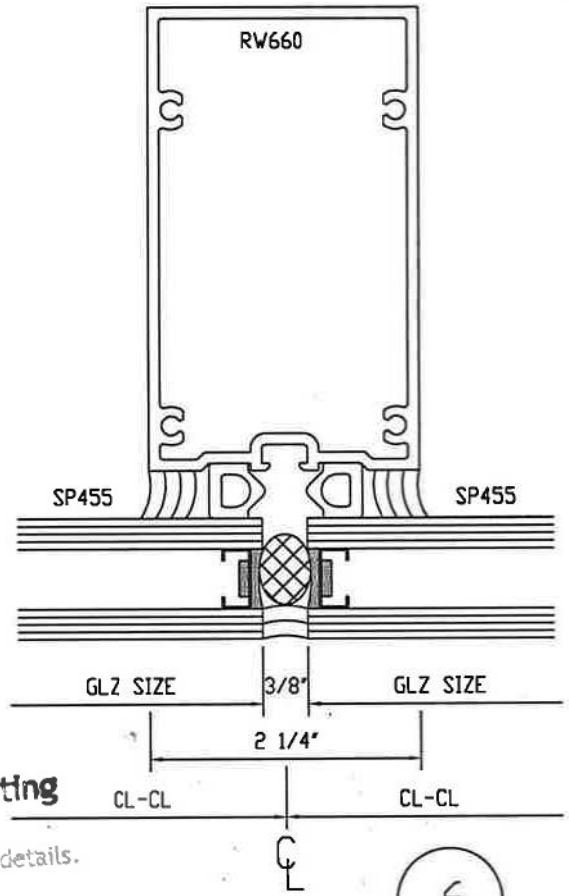


6

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# B6097

Date 12/5/12 Tech MB

ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Barillas

REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

CRL

2100 E. 38TH STREET VERNON, CA 90058
PHONE: (323) 588-1281 FAX: (323) 232-2523

DIVISION UNITED STATES ALUMINUM

DRWN BY: DCW

DATE: 12/20/2011

SCALE: FULL

THERMAL_TEST_NFRC_AAMA_1503
SERIES_TT601_SSG

DWG NO.
MU2011-002-03

MU2011-002-02

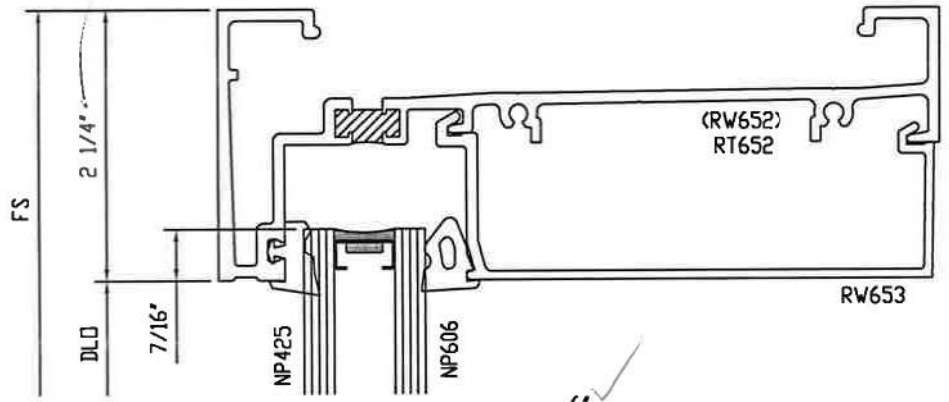
ATI

Report # B6092-116-45

Date 2/3/2012

Simulator Eric Barillas

1



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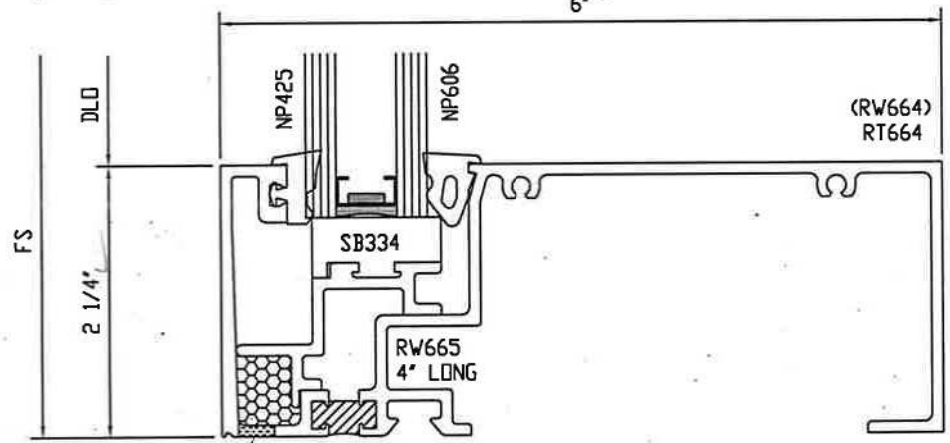

5/16" DIA WEEP
W/UB625 BAFFLE

Architectural Testing

Test sample complies with these details.
Deviations are noted.

Report# B6097

Date 12/5/12 Tech MB

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REV	REV_DESCRIPTION	DATE	XXX
SYM	REVISION	DATE	BY

DRWN BY: DCW
DATE: 12/20/2011
SCALE: FULL

THERMAL_TEST_NFRC_AAMA_1503
SERIES_TT601_SSG

DWG NO.
MU2011-002-02