

AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

CR LAURENCE CO., INC.

SERIES/MODEL: 3000 Sliding Glass Door

TYPE: Sliding Patio Door

Summary of Results		
Thermal Transmittance (U-Factor)		0.40
Condensation Resistance Factor - Frame (CRF _f)		59
Condensation Resistance Factor - Glass (CRF _g)		62
Unit Size:	78-3/4" x 78-3/4"	
Layer 1:	1/4"	PPG Solarban 70XL (e=0.018*, #2)
Gap 1:	0.53"	A1-D: Aluminum Spacer
Layer 2:	1/4"	Clear
		90% Argon*

Reference must be made to Report No. D6833.02-116-46, dated 05/13/15 for complete test specimen description and data.

AAMA 1503-09 THERMAL PERFORMANCE TEST REPORT

Rendered to:

CR LAURENCE CO., INC.
2100 East 38th Street
Vernon, California 90058

Report Number: D6833.02-116-46
Test Date: 02/12/15
Report Date: 05/13/15

Test Sample Identification:

Series/Model: 3000 Sliding Glass Door

Type: Sliding Patio Door

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 | -0.41 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) | 59 |
| Condensation resistance factor - Glass (CRF _g) | 62 |
| 2. Thermal transmittance due to conduction (U) | 0.40 |
| (U-factors expressed in Btu/hr·ft ² ·F) | |

Test Sample Description:

Frame:

Material:	AT (1.13"): Aluminum with Thermal Breaks - All Members		
Size:	78-3/4" x 78-3/4"		
Daylight Opening:	N/A	Glazing Method:	N/A
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Coped / Screws / Unsealed		

Fixed Panel:

Material:	AT (0.52"): Aluminum with Thermal Breaks - All Members		
Size:	40-5/8" x 76-1/8"		
Daylight Opening:	34-7/8" x 70-7/8"	Glazing Method:	Channel
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Square Cut / Screws / Unsealed		

Interior Panel:

Material:	AT (0.52"): Aluminum with Thermal Breaks - All Members		
Size:	40-5/8" x 76-1/8"		
Daylight Opening:	34-7/8" x 70-7/8"	Glazing Method:	Channel
Exterior Color:	Clear	Exterior Finish:	Anodized
Interior Color:	Clear	Interior Finish:	Anodized
Corner Joinery:	Square Cut / Screws / Unsealed		

Glazing Information:

Layer 1:	1/4"	PPG Solarban 70XL (e=0.018*, #2)	
Gap 1:	0.53"	A1-D: Aluminum Spacer	90% Argon*
Layer 2:	1/4"	Clear	
Gas Fill Method:	Single-Probe Method*		
Desiccant:	Yes		

**Stated per Client/Manufacturer*

N/A Non-Applicable

Test Sample Description: (Continued)

Weatherstripping:

Description	Quantity	Location
Polypile with center fin	2 rows	Active panel track sill and jambs, active meeting stile
Polypile with center fin	1 row	Active panel track head, fixed meeting stile
Dual-fin gasket	1 row	Fixed panel track head, sill and jambs
Single-fin gasket	1 row	Fixed meeting stile

Hardware:

Description	Quantity	Location
Metal lock handle assembly	1	Lock stile
Metal keeper	1	Lock jamb
Roller assembly	1 set	Bottom corners of active panel
Fixed panel riser	1	Fixed panel track sill
Metal roller track insert	1	Active panel track sill
Aluminum threshold	1	Fixed panel track sill
Vinyl interlock insert	2	Fixed and active meeting stile
Rubber bumpers	5	Two per fixed and active meeting stile, one per active panel track head
Fixed panel retainer clips	2	Head and sill at fixed panel

Drainage:

Drainage Method	Size	Quantity	Location
Weepslot with cover	1.50" x 0.25"	4	Sill face
Weepslot	1.63" x 0.25"	2	Active panel track sill
Diameter weephole	0.25"	5	Active panel track sill

Test Duration:

1. The environmental systems were started at 16:57 hours, 02/11/15.
2. The thermal performance test results were derived from 02:08 hours, 02/12/15 to 06:08 hours, 02/12/15.

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	-0.41 F
FT_p	=	Average of pre-specified frame temperatures (14)	42.08 F
FT_r	=	Average of roving thermocouples (4)	33.80 F
W	=	$[(FT_p - FT_r) / (FT_p - (T_c + 10))]$ x 0.40	0.102
FT	=	$FT_p(1-W) + W (FT_r)$ = Frame Temperature	41.24 F
GT	=	Glass Temperature	43.26 F
CRF_g	=	Condensation resistance factor – Glass	62
		$CRF_g = (GT - T_c) / (T_h - T_c)$ x 100	
CRF_f	=	Condensation resistance factor – Frame	59
		$CRF_f = (FT - T_c) / (T_h - T_c)$ x 100	

The CRF number was determined to be 59 (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_o):

T_h	=	Average warm side ambient temperature	69.80 F
T_c	=	Average cold side ambient temperature	-0.41 F
P	=	Static pressure difference across test specimen	0.00 psf
		15 mph dynamic perpendicular wind at exterior	
Nominal sample area			43.07 ft ²
Total measured input to calorimeter			1273.36 Btu/hr
Calorimeter correction			71.48 Btu/hr
Net specimen heat loss			1201.88 Btu/hr
U	=	Thermal Transmittance	0.40 Btu/hr·ft ² ·F

Glazing Deflection:

	Fixed Panel	Active Panel
Edge Gap Width	0.53"	0.53"
Estimated center gap width upon receipt of specimen in laboratory (after stabilization)	0.53"	0.50"
Center gap width at laboratory ambient conditions on day of testing	0.53"	0.50"
Center gap width at test conditions	0.44"	0.44"

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: 04:08 04:38 05:08 05:38 06:08 AVERAGE

Pre-specified Thermocouples - Frame

1	49.15	49.12	49.12	49.12	49.12	49.13
2	33.17	33.15	33.15	33.14	33.13	33.15
3	38.34	38.30	38.28	38.32	38.30	38.31
4	58.07	58.03	58.00	57.99	57.97	58.01
5	38.02	37.98	37.98	37.97	37.97	37.99
6	35.92	35.88	35.89	35.88	35.87	35.89
7	39.60	39.62	39.59	39.60	39.59	39.60
8	43.66	43.72	43.69	43.70	43.71	43.70
9	57.02	56.99	57.01	56.98	56.98	57.00
10	37.67	37.59	37.65	37.61	37.61	37.63
11	37.51	37.48	37.53	37.53	37.54	37.52
12	36.70	36.72	36.69	36.76	36.73	36.72
13	41.19	41.18	41.18	41.20	41.16	41.18
14	43.35	43.36	43.34	43.37	43.35	43.35
FT _p	42.10	42.08	42.08	42.08	42.07	42.08

Pre-specified Thermocouples - Glass

15	36.94	36.89	36.87	36.88	36.88	36.89
16	54.10	54.10	54.05	54.09	54.04	54.08
17	46.09	45.96	45.87	45.95	45.94	45.96
18	27.28	27.28	27.29	27.36	27.29	27.30
19	55.00	54.98	54.95	54.91	54.91	54.95
20	40.38	40.35	40.37	40.39	40.38	40.37
GT	43.30	43.26	43.23	43.26	43.24	43.26

Cold Point (Roving) Thermocouples

21	32.50	32.50	32.50	32.50	32.50	32.50
22	33.10	33.10	33.10	33.10	33.10	33.10
23	33.70	33.70	33.70	33.70	33.70	33.70
24	35.90	35.90	35.90	35.90	35.90	35.90
FT _R	33.80	33.80	33.80	33.80	33.80	33.80
W	0.10	0.10	0.10	0.10	0.10	0.10
FT	41.25	41.24	41.24	41.24	41.23	41.24

Warm Side - Room Ambient Air Temperature

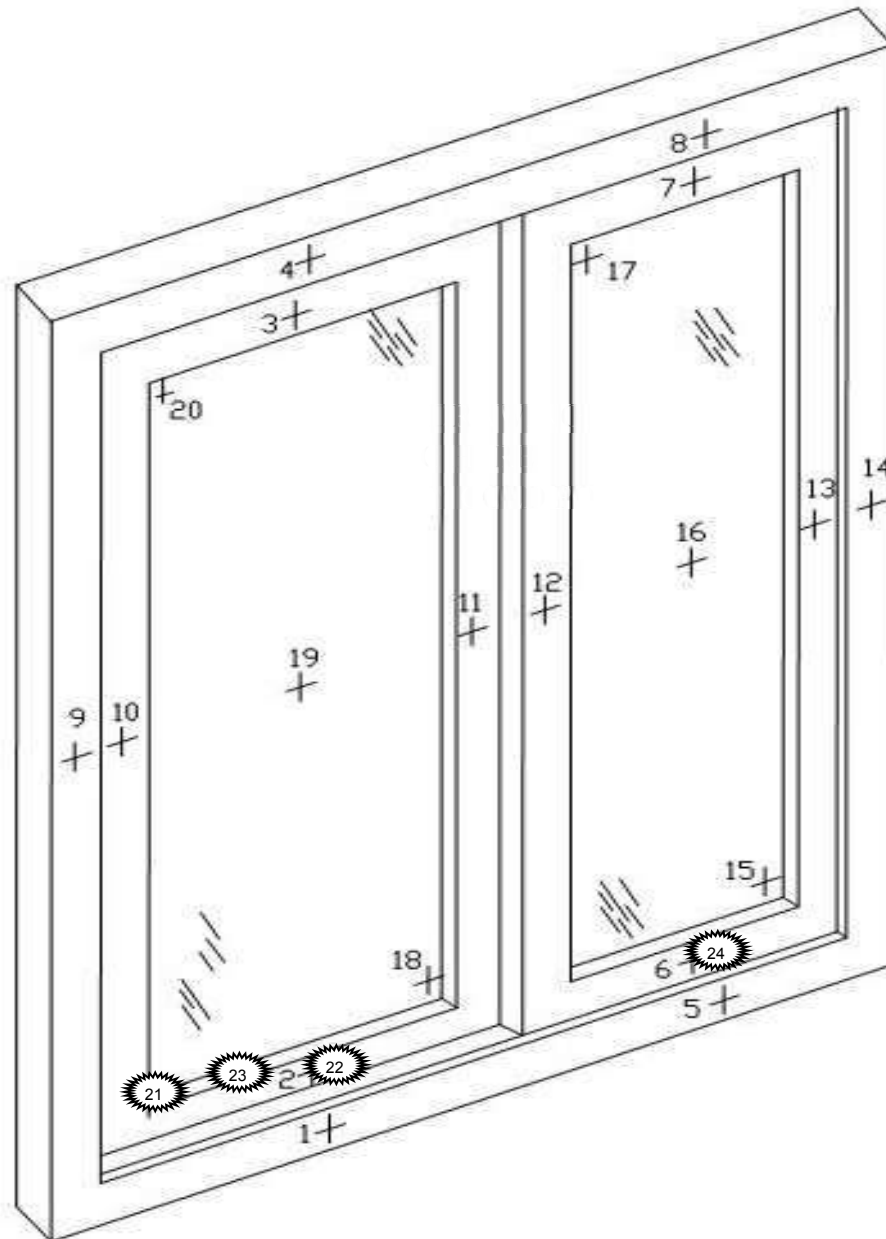
69.80	69.79	69.79	69.80	69.80	69.80
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Cold Side - Room Ambient Air Temperature

-0.39	-0.43	-0.41	-0.41	-0.42	-0.41
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CRF _f	59	59	59	59	59	59
CRF _g	62	62	62	62	62	62

Thermocouple Location Diagram



Cold Point Locations

★ 21	21. 32.50
★ 22	22. 33.10
★ 23	23. 33.70
★ 24	24. 35.90

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 February 12, 2019.

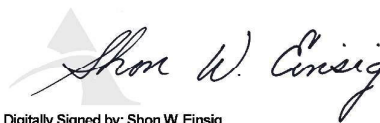
This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

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
D6833.02-116-46

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix-A: Drawings (30)

	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.
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Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.02R0	05/13/15	All	Original Report Issue. Work requested by Gyu-Hyeon Kim of CR Laurence Co., Inc.



Appendix A: Drawings

D6833.02-116-46

NFRC PRODUCT CERTIFICATION PROGRAM

Submittal Form for Test Samples

For use by manufacturers, lineal suppliers and fabricators



1. Information on Production of the Test Sample (complete ALL fields):

Manufacturer: CRL - US Aluminum Date of sample manufacture: 12/30/2014
Plant Address where manufactured: 2100 E 38th St
City: Vernon State: CA Zip Code: 90085-1617
Name of IA: Associated Laboratories, Inc Phone: (214)565-0593 Fax: (214)565-1094

2. Product Information (complete ALL fields):

Product Line ID (CPD) No.: _____ Product/Operator Type (Table 4-3 of NFRC 100): Sliding Patio Door with I

Series/Model: 3000 Sliding Door

3. Test sample is being submitted for (select ONE):

- a. ☐ Validation for Initial Certification (prototype only) no plant qualification
- b. ☒ Validation for Initial Certification (production line unit) & plant qualification
- c. ☐ Validation for Recertification (production line unit) & plant qualification
- d. ☐ Plant Qualification Only (production line unit)

I, Gyu Hyeon Kim, as the designated agent for CRL - US Aluminum

do hereby attest that the foregoing information is true to the best of my information, knowledge, and belief. Further, if the unit is identified in Section 3 as a production line unit, I hereby authorize the NFRC-accredited testing laboratory to send a copy of the test report to the IA identified above for plant qualification purposes pursuant to the NFRC Product Certification Program..

Signature: Gyu Hyeon Kim

Digitally signed by Gyu Hyeon Kim
Date: 2015.02.06 09:37:28 -08'00'

Date: 2/6/2015

FOR LABORATORY USE ONLY

1. Laboratory: Architectural testing
2. Date Sample Received: 1/9/15 File number ID: 06833
3. Date Sample Tested: 2/12/15 By: rpm
4. Modifications made: _____
5. Reason for non-testing of sample unit: _____

[Note: If the sample submitted can not be tested due to damage prior to testing, a new sample and new form shall be submitted to the testing laboratory. Both forms shall be submitted to the IA when the testing is completed.]

3000 SLIDING DOOR SYSTEM

Intertek

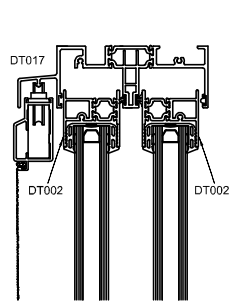


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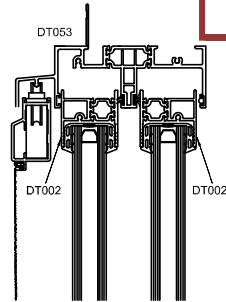
Date: 02/12/2015

Verified by: *Ryan P. Moser*

HEADS

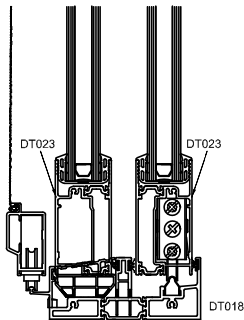


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1" GLAZING
BLOCK HEAD
DT017 / DT002

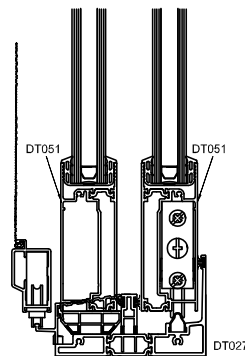


3000 HEAD
1" GLAZING
FIN HEAD
DT053 / DT002

SILLS

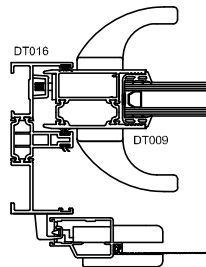


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3025
DT018 / DT023

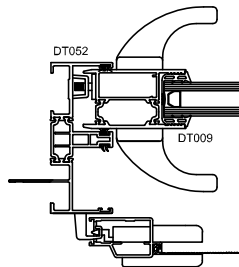


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1" GLAZING
3040/3060
DT027 / DT051

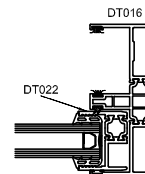
JAMBS



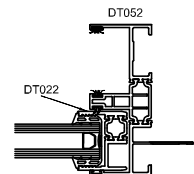
3000 JAMB
1" GLAZING
BLOCK VENT
DT016 / DT009



3000 JAMB
1" GLAZING
FIN VENT
DT052 / DT009

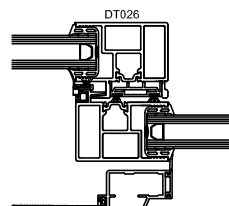


3000 JAMB
1" GLAZING
BLOCK FIXED
DT016 / DT022

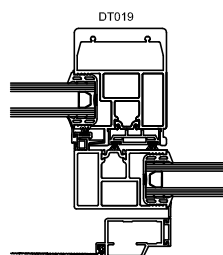


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FIN FIXED
DT052 / DT022

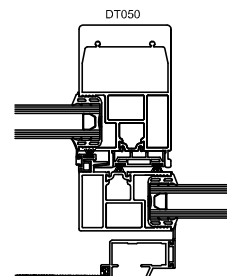
INTERLOCK



3000 INTERLOCK
1" GLAZING
3025
DT026



3000 INTERLOCK
1" GLAZING
3040
DT019



3000 INTERLOCK
1" GLAZING
3060
DT050