Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05
TEST REPORT

Rendered to:

United States Aluminum

SERIES/MODEL: 900
PRODUCT TYPE: Architectural Terrace Door Outswing Pair

Title	Summary of Results
Primary Product Designator	ATD-HC40 2134 x 2489 (84 x 98)
Design Pressure*	1920 Pa (40.10 psf)
Negative Design Pressure*	1920 Pa (40.10 psf)
Force to Latch	62 N (14 lbf)
Air Infiltration	0.56 L/s/m^2 (0.11 cfm/ft^2)
Water Penetration Resistance Test Pressure*	580 Pa (12.11 psf)
Uniform Load Structural Test Pressure	±2880 Pa (60.15 psf)
Forced Entry Resistance	Pass

*-Optional Secondary Designators **Test Completion Date**: 03/22/06

Reference must be made to Report No. 63401.01-801-44 for complete test specimen description and data.

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Architectural Testing

AAMA/WDMA/CSA 101/I.S.2/A440-05 TEST REPORT

Rendered to:

UNITED STATES ALUMINUM
200 SINGLETON DRIVE
WAXAHACHIE, TEXAS 75165

Report No.:	63401.01-801-44
Test Dates:	03/06/06
Through:	03/22/06
Report Date:	05/24/06
Expiration Date:	03/22/10

Project Summary: Architectural Testing, Inc. (ATI) was contracted by United Stats Aluminum to perform testing on a Series/Model 900, outswing pair architectural terrace door. The sample tested successfully met the performance requirements for an ATD-HC40 2134 x 2489 (84 x 98) rating. Test specimen description and results are reported herein.

Test Specification: The test specimen was evaluated in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-05, *Standard/Specification for Windows, Doors, and Unit Skylights.*

Test Specimen Description:

Series/Model: 900

Product Type: Architectural Terrace Door, Outswing Pair

Overall Size: 2134 mm (84") wide by 2489 mm (98") high

Rough Opening Size: 2146 mm (84-1/2") wide by 2502 mm (98-1/2") high

Active Panel Size: 1047 mm (41-1/4") wide by 2451 mm (96-1/2") high

Active Daylight Opening Size: 857 mm (33-3/4") wide by 2267 mm (89-1/4") high

Inactive Panel Size: 1080 mm (42-1/2") wide by 2451 mm (96-1/2") high

Inactive Daylight Opening Size: 857 mm (33-3/4") wide by 2267 mm (89-1/4") high

Overall Area: 5.18 m^2 (55.80 ft^2)

Finish: Painted Aluminum

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Test Specimen Description: (Continued)

Frame Construction: Coped and butted and secured with two #12 x 1" ST-267 screws at each corner. The corners were sealed full perimeter with narrow joint seam sealer.

Frame Components Parts List

Description	Quantity	Part#	Manufacturer
Interior Head	1	H-61265	International Extrusion
Interior Jamb	2	H-61263	International Extrusion
Interior Threshold	1	H-61267	International Extrusion
Exterior Head	1	H-61266	International Extrusion
Exterior Jamb	2	H-61264	International Extrusion
Exterior Threshold	1	H-61266	International Extrusion
Isobar	2 per frame member	4369	Ensinger

Leaf Construction: Mitered and secured with aluminum corner keys and crimped. The astragal was secured to the inactive panel with two #8 x 3" screws located 10-1/2" and 79-3/4" from the bottom and with two #8 x 2-1/2" screws located 44" and 56" from the bottom. Hinges were sealed to the frame and leaf with sealant full perimeter.

Leaf Components Parts List

Description	Quantity	Part#	Manufacturer
Interior Rails and Stiles	4	H-61272	International Extrusion
Exterior Rails and Stiles	4	H-61273	International Extrusion
Interior Astragal	1	T-61271	International Extrusion
Exterior Astragal	1	H-61270	International Extrusion
Isobar	2 per member	4369	Ensinger
Glass Stop	4 per panel	60939	International Extrusion

Test Specimen Description: (Continued)

Weatherstripping:

Description	Quantity	Location	Joinery	Retaining method	Part#	Manufacturer
0.225" diameter foam filled vinyl bulb	1 row	Active stiles cut 12" from the top	Kerf	Friction	WH-342	Amesbury
0.225" diameter foam filled vinyl bulb	1 row	Inactive hinge stile cut 12" from top	Kerf	Friction	WH-342	Amesbury
0.225" diameter foam filled vinyl bulb	1 row	Inactive bottom rail cut 10" hinge stile	Kerf	Friction	WH-342	Amesbury
0.225" diameter foam filled vinyl bulb	1 row	Active bottom rail cut 10" from both ends	Kerf	Friction	WH-342	Amesbury
0.212" diameter vinyl bulb	1 row	Frame perimeter	Kerf	Friction	PP-1380	Amesbury
0.212" diameter vinyl bulb	1 row	Astragal	Kerf	Friction	PP-1380	Amesbury
0.385" back with 0.375" high fin and 0.250" pile	2-1/2"	Active lock stile at bottom lateral face	Adhesive	Adhesive		
0.270" back with 0.375" high pile	1-1/4"	Inactive lock stile top and bottom	Adhesive	Adhesive		
0.270" back with 0.375" high pile	2-1/2"	Astragal top	Adhesive	Adhesive		

Glazing Details: Sealed insulating glass with two pieces of 1/4" tempered and a 1/2" aluminum spacer system. The unit was exterior glazed with double sided tape at the interior and a WN-429 glass stop at the exterior. A PS-1127 wedge gasket was located at the exterior perimeter of the glazing. Glass was set against SB-222 setting blocks and WB-410 side blocks. Overall glass size was 889 x 2299 (35" x 90-1/2").

Test Specimen Description: (Continued)

Drainage:

Description	Quantity	Location
5/8" x 3/8"	2	1" on center from the midpoint of the sill in the strike plate.
1-1/4" x 3/16" with plastic flap	3	3" on center from each end of the sill exterior face and at the midpoint
3/4" x 1/8"	4	4-1/2" on center from each end of both bottom rails under the glazing stop.

Hardware:

Description	Quantity	Location	Retaining method	Part#	Manufacturer
5 point lock	1	Active lock stile	(15) #8 x 3/4" screws and (2) #8 x 7/8" screws	HLS-9000	Hoppe
2 point lock	1	Inactive lock stile	(15) #8 x 3/4" screws and (2) #8 x 7/8" screws	HLS-9000	Hoppe
Brass handle	2	Active and inactive lock stiles	Three #10 x 2-1/2" screws and one #10 x 2" screw	M112P	Hoppe
Shoot bolt plate	2	Head and sill	Three # 8 x 3/4" screws	TO 900-41	US Aluminum
Shoot bolt plate	1	Inactive lock stile top	(1) #8 x 3" screw and (1) #8 x 3/4" screw	TO 900-42	US Aluminum
Shoot bolt plate	1	Inactive lock stile bottom	(2) #8 x 3/4" screws	TO 900-42	US Aluminum
Escutcheon plate	2	Active and inactive lock stiled	Three #10 x 2-1/2" screws	M216N	Hoppe
Strike plate	1	Head, sill, inactive lock stile	(3) #8 x 3/4" screws	TO 900-40	US Aluminum
Butt hinge	6	Active and inactive hinge stiles	(4) #12 x 7/8" to fame and (4) #12 x 1" to stile	TO 900-24	US Aluminum
Weep cover assembly	3	Each end and at the midpoint of the sill	Snap-in	WH276	IWC

Test Specimen Description: (Continued)

Installation: The unit was installed into a pine 2x12 buck with backer rod and a butt joint of sealant full perimeter at the exterior. The head and sill were secured to the buck with 1/4" x 3" stainless steel screws located 6", 22", 38", and 41" from each end. The heads of the fasteners in the sill were sealed. The jambs were secured with 1/4" x 3" stainless steel screws located 6", 8", 18", 36", 54", 73", 88", and 91" from the bottom. Petroleum jelly was applied to the exterior of the cylinder lock to limit water infiltration.

Test Results: The results are tabulated as follows:

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.1.2	Force to Latch Side-Hinged Door System per ANSI/BHMA A156.2		
	Force to latch	62 N (14 lbf)	65 N (15 lbf) max.
	Deadbolt	53 N (12 lbf)	65 N (15 lbf) max.
5.3.2.1	Air Leakage Resistance per ASTM E 283		
	300 Pa (6.2 psf)	0.56 L/s/m^2 (0.11 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.

***Note #1**: The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance.*

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.3.2	Water Penetration Resistance per ASTM E 547 and E 331		
	290 Pa (6.07 psf)	No leakage	No leakage

Paragraph	Title of Test - Test Method	Results				
		Indicator number				
		1	2	3	Net	Allowed
5.3.4.2	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the astragal) (Loads were held for 10 seconds)					
	1920 Pa (40.10 psf) (positive)	4 mm (0.17")	15 mm (0.61")	4 mm (0.14")	12 mm (0.46")	14 mm (0.55")
	1920 Pa (40.10 psf) (negative)	2 mm (0.08")	13 mm (0.53")	2 mm (0.09")	11 mm (0.45")	14 mm (0.55")
	See Note #2					

Test results: (continued)

Paragraph	Title of Test - Test Method	Results				
		Indicator number				
5.3.4.2	Uniform Load Deflection per ASTM E 330 (Deflections were taken on the active panel bottom rail) (Loads were held for 10 seconds)	1	2	3	Net	Allowed
	1920 Pa (40.10 psf) (positive)	4 mm (0.14")	2 mm (0.09")	0 mm (0.00")	1 mm (0.02")	6 mm (0.24")
	1920 Pa (40.10 psf) (negative)	2 mm (0.08")	13 mm (0.53")	2 mm (0.09")	5 mm (0.22")	6 mm (0.24")
	See Note #2					

Note #2: *The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440-05 for this product designation. The deflection data is recorded in this report for special code compliance and information only.*

		Indicator number				
5.3.4.3	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the astragal) (Loads were held for 10 seconds)	1	2	3	Net	Allowed
	2880 Pa (60.15 psf) (positive)	1 mm (0.05")	2 mm (0.08")	1 mm (0.05")	1 mm (0.03")	7 mm (0..29")
	2880 Pa (60.15 psf) (negative)	<1 mm (0.01")	1 mm (0.04")	1 mm (0.03")	<1 mm (0.02")	7 mm (0.29")

		Indicator number				
5.3.4.3	Uniform Load Structural per ASTM E 330 (Permanent sets were taken on the active panel bottom rail) (Loads were held for 10 seconds)	1	2	3	Net	Allowed
	2880 Pa (60.15psf) (positive)	1 mm (0.05")	1 mm (0.02")	1 mm (0.02")	<1 mm (<.01")	3 mm (0.12")
	2880 Pa (60.15 psf) (negative)	1 mm (0.03")	1 mm (0.03")	1 mm (0.02")	<1 mm (0.05")	3 mm (0.12")

Test results: (continued)

Paragraph	Title of Test - Test Method	Results	Allowed
5.3.5	Forced Entry Resistance per AAMA 1304		
	1330 N (300 lbf) point load		
	Top lock stile corner	No entry	No entry
	Bottom lock stile corner	No entry	No entry
	Above lock	No entry	No entry
5.3.6.10	Operation/Cycling Performance per AAMA 920		
	25,000 cycles	Meets as stated	Meets as stated
5.3.6.11	Vertical Loading Resistance per AAMA 925		
	Pre-load - 200 N (45 lbf)		
	Maximum vertical deflec.	<0.3 mm (<0.01")	N/A
	Residual vertical deflec.	<0.3 mm (<0.01")	N/A
	Test load - 1115 N (250 lbf)		
	Maximum vertical deflec.	5 mm (0.21")	N/A
	Residual vertical deflec.	2 mm (0.08")	N/A
	Diagonal deformation	<0.3 mm (<0.01")	N/A
	Force to latch	22 N (5 lbf)	65 N (15 lbf) max.
Optional Performance			
4.4.2.6	Water Penetration Resistance per ASTM E 547 and E 331		
	580 Pa (12.11 psf)	No leakage	No leakage

Drawing Reference: The test specimen drawings have been reviewed by ATI and match the test specimen reported herein.

Detailed drawings, representative samples of the test specimen, and a copy of this report will be retained by ATI for a period of four years from the original test date. The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the above referenced specification. This report does not constitute certification of this product, which may only be granted by the certification program administrator. This report may not be reproduced, except in full, without the approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.

Digitally Signed by: Andy Cost

Andy Cost
Laboratory Manager

Digitally Signed for: John H. Waskow by Amanda J. Lolling

John Waskow
Director of Regional Operations

AC:al
63401.01-801-44-R0
Attachments (pages):
Appendix-A: Alteration Addendum (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	05/24/06	N/A	Original report issue

Appendix A:

Alteration Addendum

Alteration #1: Date-03/06/06
Cause for alteration- Excessive air infiltration
Remedial action taken- Added pile pads at the top and bottom of the astragal

Alteration #2: Date-03/06/06
Cause for alteration- Excessive air infiltration
Remedial action taken- Sealed hinges to the jamb and hinge stiles

Alteration #3: Date-03/06/06
Cause for alteration- Water infiltration
Remedial action taken- Added sealant to frame sill to jamb joints.

Alteration #4: Date-03/07/06
Cause for alteration- Water Infiltration
Remedial action taken- Added pile pad at the bottom of the inactive panel lock stile.

Alteration #5: Date-03/07/06
Cause for alteration- Water infiltration
Remedial action taken- Sealed panel bottom rail to stile joints with seam sealer

Alteration #6: Date-03/07/06
Cause for alteration- Water infiltration
Remedial action taken- Replaced hardware gaskets

Alteration #7: Date-03/07/06
Cause for alteration- Water infiltration
Remedial action taken- Added petroleum jelly to lock cylinder at exterior.