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INTERNATIONAL WINDOW TEST REPORT

SCOPE OF WORK
AAMA/WDMA/CSA 101/I.S.2/A440-08 AND -11 TESTING ON THE FOLLOWING PRODUCT:

5420 SINGLE HUNG WINDOW (SIDE LOAD)

REPORT NUMBER
H3343.01-301-44 R1

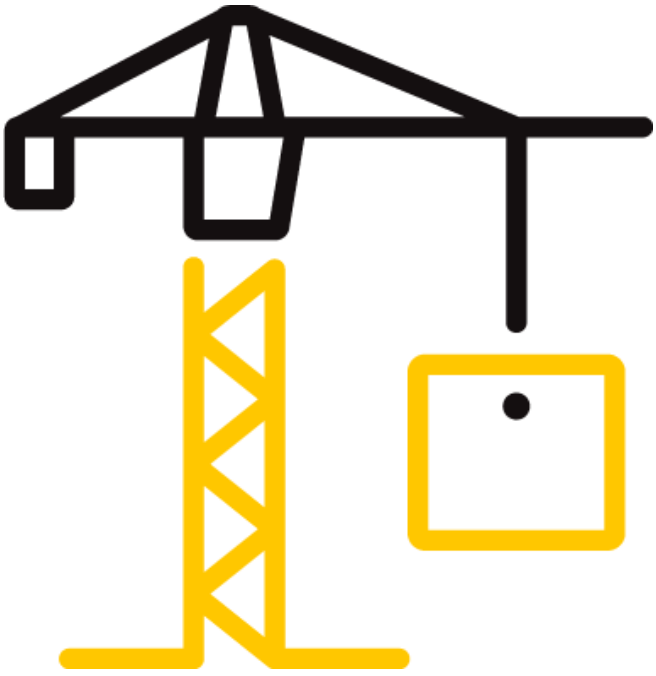
TEST DATES
07/06/17 - 08/25/17

ISSUE DATE **REVISION DATE**
09/19/17 09/28/17

RECORD RETENTION END DATE
08/25/22

PAGES
12

DOCUMENT CONTROL NUMBER
ATI 00438 (07/24/17)
RT-R-AMER-Test-2804



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TEST REPORT FOR INTERNATIONAL WINDOW

Report No.: H3343.01-301-44 R1
Date: 09/19/17
Revision 1 Date: 09/28/17

REPORT ISSUED TO
INTERNATIONAL WINDOW
1551 E. Orangethorpe Ave.
Fullerton, California 92831

SECTION 1
SCOPE

Intertek Building & Construction (B&C) was contracted by International Window to perform testing in accordance with AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11, *NAFS 2008 and 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights,* on their 5420 Single hung window (side load). Results obtained are tested values and were secured by using the designated test methods. Testing was conducted at Intertek-ATI test facility in Fresno, California.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

SECTION 2
SUMMARY OF TEST RESULTS

TITLE	RESULTS
AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11	Class LC – PG40: Size Tested 1215 x 2135 (48 x 84) – Type H
Design Pressure	±2160 Pa (±45.11 psf)
Uniform Structural Load	±2880 Pa (±60.15 psf)
Air Infiltration	0.8 L/s/m^2 (0.15 cfm/ft^2)
Canadian Air Infiltration	A2
Water Penetration Resistance Test Pressure	290 Pa (6.06 psf)

For INTERTEK B&C:

COMPLETED BY:	William Jay Ratliff	**REVIEWED BY:**	Tyler Westerling, P.E.
TITLE:	Technician – Structural	**TITLE:**	Senior Project Engineer
SIGNATURE:	 Digitally Signed by: Jay Ratliff	**SIGNATURE:**	 Digitally Signed for: Tyler Westerling by Shannon Stein
DATE:	09/28/17	**DATE:**	09/28/17

WJR:ss

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SECTION 3
TEST METHODS

The specimens were evaluated in accordance with the following:

AAMA/WDMA/CSA 101/I.S.2/A440-08 and -11, *NAFS 2008 and 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

CAWM 301 – 90, *Forced entry resistance test for windows*

SECTION 4
MATERIAL SOURCE/INSTALLATION

Test specimen was provided by the client. Representative samples of the test specimens will be retained by Intertek B&C for a minimum of five years from the test completion date.

The specimen was installed into a wood buck. The rough opening allowed for a 1/4" shim space. The exterior perimeter of the window was sealed with silicone.

LOCATION	ANCHOR DESCRIPTION	ANCHOR LOCATION
Nail fin	#10 x 3" screws	4" from corners; 16" on center through a 2 x 2 wood strip.

SECTION 5
EQUIPMENT

Type	Manufacturer	Asset Number
Control Panel	Intertek-ATI	005724
Micro MULE	Intertek-ATI	005722
Lab conditions monitor	Comet	63304
Deglazing fixture	Intertek-ATI	005264
Load Cell – 1 k	Interface	63196
Load Cell – 3k	Interface	65472
Digital Force Gauge	Wagner	65863
Spray Rack – Lab	Intertek-ATI	004047
Linear Transducer	Celesco	003428, 004486, 004488, 005282, 63346, 63349

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SECTION 6
LIST OF OFFICIAL OBSERVERS

NAME	COMPANY
William Jay Ratliff	Intertek B&C
Erick Caldera	Intertek B&C

SECTION 7
TEST SPECIMEN DESCRIPTION

Product Type: Hung Window (side load)
Series/Model: 5420

Product Size:

OVERALL AREA:	**WIDTH**		**HEIGHT**	
2.6 m² (28 ft²)	**millimeters**	**inches**	**millimeters**	**inches**
Overall Size	1215	48	2135	84
Sash	1168	46	1070	42-1/8
Screen	1170	46	1030	40-1/2

Frame Construction:

FRAME MEMBER	**MATERIAL**	**DESCRIPTION**
Head, sill, jambs	PVC	
Bumpers	PVC	
Fixed Meeting Rail	PVC	
	JOINERY TYPE	**DETAIL**
All Corners	Mitered	Fully Welded.
Bumpers	Snap fit	One in each track, at the top
Fixed Meeting Rail	Coped	Secured through frame with 2 #10 x 4-1/2 at each end. The screws were sealed.

Sash Construction:

SASH MEMBER	**MATERIAL**	**DESCRIPTION**
All	PVC	Extruded; white.
	JOINERY TYPE	**DETAIL**
All Corners	Mitered	Fully Welded

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Reinforcement:

PART NUMBER	LOCATION	MATERIALS
50600	Fixed meeting rail	Aluminum
50601	Sash meeting rail	Aluminum

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
0.430" high polypile with center fin	1 row	Fixed meeting rail
0.310" high polypile with center fin	1 rows	Sash rails and stiles

Glazing: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimens can be made.*

GLASS TYPE	SPACER TYPE	INTERIOR LITE	EXTERIOR LITE	GLAZING METHOD
1" IG	Super Spacer	1/8" annealed	1/8" annealed	Exterior glazed onto a 1/2" wide x 1/16" high glazing tape and secured with a snap in PVC glazing bead.

LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Fixed D.L.O.	1	1085 x 980	42-3/4 x 38-9/16	1/2"
Sash D.L.O.	1	1085 x 980	42-3/4 x 38-9/16	1/2"

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Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weephole with cover	1-3/4" wide by 1/4" high (1-3/8"wide by 3/16" high effective)	2	Face of sill, 4-1/2" from corners
Weephole	1-3/4" wide by 1/4" high	2	4-1/2" from ends punched through the 2nd layer of internal wall in the sill.
Weephole	9/16" round	1	Sash channel, 4-1/2" from ends and notched the 3rd layer of internal sill wall
Weephole	1/4" round	2	Screen track, 3" from ends

Hardware:

DESCRIPTION	QUANTITY	LOCATION
Block and Tackle Balance	1 set	Each Jamb
Auto lock	1	Midspan of the top rail of the interior sash secured with two #6 x 1/2" Phillips flat head screws.
Keeper	1	Opposite the lock on the fixed meeting rail, secured with #8 x 3/4" Phillips flat head tek screws fastened into the reinforcement

Screen Construction:

FRAME MATERIAL	CORNER CONSTRUCTION	MESH TYPE	MESH ATTACHMENT METHOD
Rolled formed aluminum	Square cut with corner key	Fiberglass	Hollow spine

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SECTION 8
TEST RESULTS

The temperature during testing was 27°C (80°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Operating Force, per ASTM E2068	Initiate Motion: 53 N (12 lbf) Maintain Motion: 111 N (25 lbf) Latches: 18 N (4 lbf)	Report only 180 N (40.47 lbf) max 100 N (22.48 lbf) max	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	0.8 L/s/m^2 (0.15 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.	1, 2
Canadian Air **Infiltration/Exfiltration Level**	A2	N/A	
Water Penetration, per ASTM E547 at 180 Pa (3.76 psf)	N/A	N/A	4
Uniform Load Deflection, per ASTM E330 Deflections taken at: *The Meeting Rail* +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	N/A	N/A	4
Uniform Load Structural, per ASTM E330 Permanent set taken at: *The meeting rail* +1800 Pa (+37.59 psf) -1800 Pa (-37.59 psf)	N/A	N/A	4
Forced Entry Resistance, per ASTM F588 Type: A - Grade: 10	Pass	No entry	
Forced Entry Resistance, per CAWM 301-90 Type: 1	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	

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TITLE OF TEST	RESULTS	ALLOWED	NOTE
Deglazing, per ASTM E987 Operating direction, 320 N (71.9 lbf) Remaining Direction 230 N (51.7lbf)	 Pass Pass	 Meets as stated Meets as stated	
OPTIONAL PERFORMANCE			
Water Penetration, per ASTM E547 at 260 Pa (6.06 psf)	Pass	No leakage	3
Uniform Load Deflection, per ASTM E330 Deflections taken at: *The meeting rail* +2160 Pa (+45.11 psf) -2160 Pa (-45.11 psf)	 4.0 mm (0.16") 4.0 mm (0.16")	 Report only	 5, 6, 7
Uniform Load Structural, per ASTM E330 Permanent set taken at: *the meeting rail* +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	 0.3 mm (0.01") 0.3 mm (0.01")	 4.7mm (0.18") max. 4.7 mm (0.18") max.	 6, 7

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

Note 2: Test Date 08/24/17 / Time: 01:17 PM

Note 3: With and without insect screen.

Note 4: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 5: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation. The deflection data is recorded in this report for special code compliance and information only.

Note 6: Loads were held for 10 seconds.

Note 7: Tape and film were used to seal against air leakage during structural testing. In our opinion, the tape and film did not influence the results of the test.

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SECTION 9
ALTERATIONS

Alteration #1: Date - 8/24/17
Cause for alteration – Failed operating force
Remedial action taken – Replaced the balances

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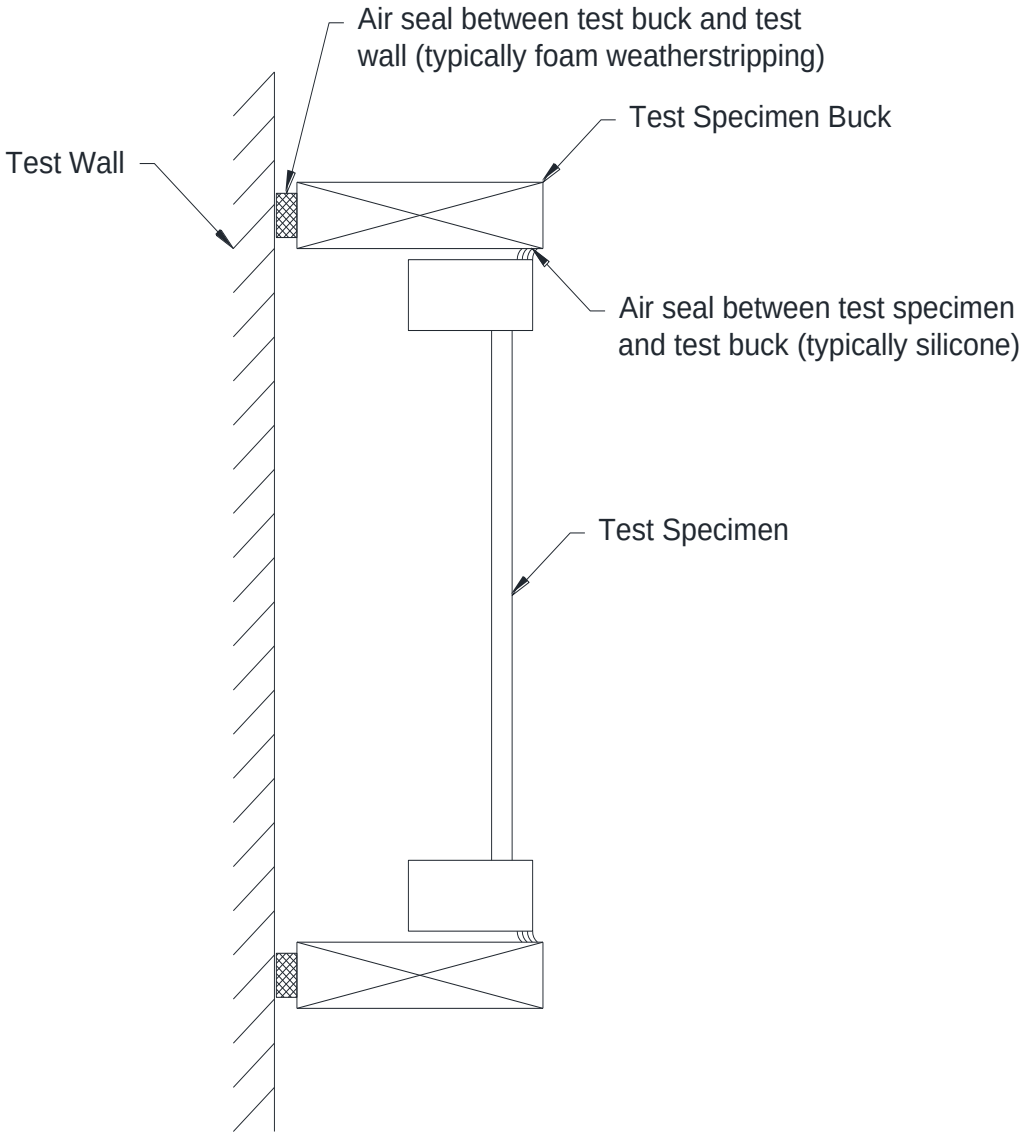
SECTION 10
LOCATION OF AIR SEAL

The air seal between the test specimen and the test wall is detailed below. The seal is made of foam weatherstripping and is attached to the edge of the test specimen buck. The test specimen buck is placed against the test wall and clamped in place, compressing the weatherstripping and creating a seal.



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SECTION 11
CONCLUSION

The specimen tested successfully met the performance for the following rating:

Class LC – PG40: Size Tested 1215 x 2135 (47-13/16 x 84) – Type H

SECTION 12
DRAWINGS

The test specimen drawings have been reviewed by Intertek B&C and are representative of the test specimens reported herein. Test specimen construction was verified by Intertek B&C per the drawings included in this report. Any deviations are documented herein or on the drawings.

***Note**: Complete drawing packet on file with Intertek B&C.*

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SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	09/19/17	N/A	Original Report Issue
1	09/28/17	4,5	Corrected sash height, corrected sash and fixed lite Daylight opening height.