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INTERNATIONAL WINDOW TEST REPORT

SCOPE OF WORK
AAMA/WDMA/CSA 101/I.S.2/A440-11 TESTING ON:

5420 DOUBLE-HUNG (TILT-OUT)

REPORT NUMBER
H3345.01-301-44 R0

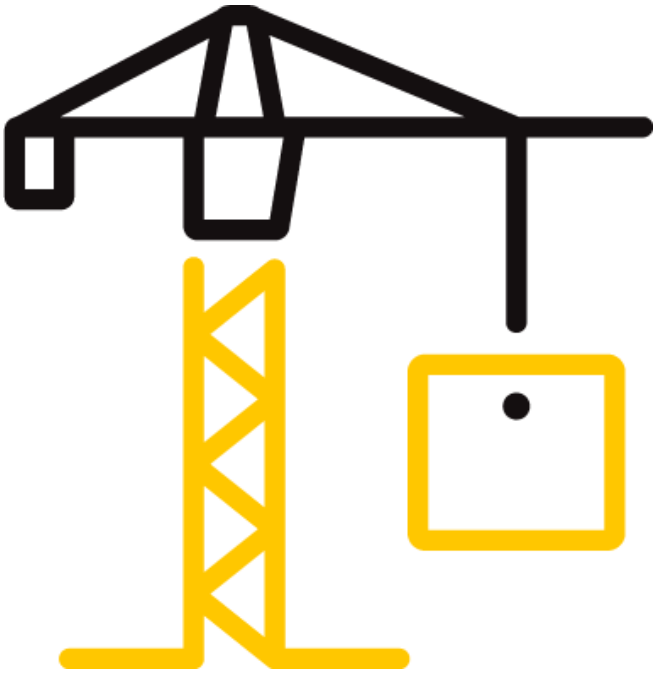
TEST DATES
07/06/17 - 07/27/17

ISSUE DATE
09/26/17

RECORD RETENTION END DATE
07/27/22

PAGES
13

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



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TEST REPORT FOR INTERNATIONAL WINDOW

Report No.: H3345.01-301-44 R0
Date: 09/26/17

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/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights,* on their 5420 Double Hung (tilt-out). 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/A440-11	Class LC – PG25: Size Tested 1220 x 2130 (48 x 84) – Type H
Design Pressure	±1200 Pa (±25.06 psf)
Air Infiltration	1.5 L/s/m^2 (0.29 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level	A2
Water Penetration Resistance Test Pressure	180 Pa (3.76 psf)

For INTERTEK B&C:

COMPLETED BY:	William Jay Ratliff	**REVIEWED BY:**	Tyler Westerling, P.E.
TITLE:	Technician – Structural	**TITLE:**	Senior Project Engineer
SIGNATURE:	William Jay Ratliff Digitally Signed by: Jay Ratliff	**SIGNATURE:**	Tyler Westerling /m.s. Digitally Signed for: Tyler Westerling by Marisela Saavedra
DATE:	09/26/17	**DATE:**	09/26/17

WJR:ms

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SECTION 3
TEST METHODS

The specimens were evaluated in accordance with the following:

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

CAWM 301 - 90 – *Forced entry resistance tests 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" Phillips flat head screw	4" from corners; 16" on center through a 1 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	003427, 003430, 004486, 005281, 005282, 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
Series/Model: 5420 Double-Hung (tilt-out)

Product Sizes:

OVERALL AREA:	**WIDTH**		**HEIGHT**	
2.6 m² (28 ft²)	**millimeters**	**inches**	**millimeters**	**inches**
Overall Size	1220	48	2130	83-7/8
Exterior Sash	1125	44-1/4	1030	40-1/2
Interior Sash	1125	44-1/4	1055	41-1/2
Screen	1113	4-3/8	2065	43-13/16

Frame Construction:

FRAME MEMBER	MATERIAL	DESCRIPTION
Head, sill, jambs	PVC	Extruded; white.
Vent stop, DH head adapter	PVC	Extruded, white.
	JOINERY TYPE	**DETAIL**
Frame corners	Mitered	Fully Welded.
Vent stop	Snap fit	Snapped into frame jambs, interior track at head
DH head adapter	Snap fit	Snapped into frame head, interior track.

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Sash Construction:

SASH MEMBER	MATERIAL	DESCRIPTION
Rails, Stiles, Glazing Bead	PVC	Extruded; white.
	JOINERY TYPE	**DETAIL**
All Corners	Mitered	Fully welded.
Glazing Bead	Snap	Snapped into sash frame after glass was set.

Reinforcement:

PART NUMBER	LOCATION	MATERIALS
C-1500	Bottom sash meeting rail	Aluminum
C-1504	Bottom sash stiles	Aluminum
C-1506	Bottom sash bottom rail	Aluminum
C-1515	Top sash meeting rail	Aluminum
C-1781	Top sash stiles	Aluminum

Weatherstripping:

DESCRIPTION	QUANTITY	LOCATION
.187x.310 polypile with finseal	1 row	Top sash top and bottom rail
.187x.310 polypile with finseal	2 rows	All sash stiles
.187x.310 polypile with finseal	1 row	Bottom sash meeting rail
.187 x .220 polypile with finseal	1 row	Double-hung head adapter
Bulb gasket	1 row	Bottom sash, bottom rail

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	Duralite	1/8" Annealed	1/8" Annealed	Exterior glazed onto one row of 1/16" thick x 1/2" wide glazing tape and secured in place with a snap in glazing bead.
1" IG	Steel Intercept	3/32" Annealed	3/32" Annealed	

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LOCATION	QUANTITY	DAYLIGHT OPENING		GLASS BITE
		millimeters	inches	
Interior sash	1	1030 x 960	40-1/2 x 37-3/4	1/2"
Exterior sash	1	1030 x 960	40-1/2 x 37-3/4	1/2"

Drainage:

DRAINAGE METHOD	SIZE	QUANTITY	LOCATION
Weephole with cover	1-3/4" wide by 3/16" high (1-1/4"wide by 1/8 high effective)	2	4-1/4" from corners of exterior face of sill.
Weephole	1/8" round	2	1" from corners of sill through 1st layer of sill floor.

Hardware:

DESCRIPTION	QUANTITY	LOCATION
Block and tackle balance	2 sets	Each balance was held by one #8 x 1" Phillips flat head self-drilling screw into frame jambs, and one friction stop foot.
Auto lock	1	Bottom sash meeting rail, secured with two #6 x 1/2" Phillips flat head screws.
Keeper	1	Opposite the lock on the bottom rail of the top sash secured with two #8 x 3/4" Phillips flat head screws fastened into the reinforcement
Pivots	2 sets	Fastened with two #6 x 3/4" screws; one set of pivots at the corners of the interior sash bottom rail and one set of pivots at the corners of the exterior sash bottom rail.
Tilt Latches	2 sets	Push in; one set of sash latches at the corners of the interior sash top rail and one set of sash latches at the corners of the exterior sash bottom rail.

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Screen Construction:

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

SECTION 8
TEST RESULTS

The temperature during testing was 28°C (82°F). The results are tabulated as follows:

TITLE OF TEST	RESULTS	ALLOWED	NOTE
Operating Force, per ASTM E2068	Initiate Motion: 107 N (24lbf) Maintain Motion: 165 N (37 lbf) Lock: 20 N (4.45 lbf) Tilt Latch: 14.5 N (3.25 lbf)	Report only 180 N (40.47 lbf) max 100 N (22.48 lbf) max 100 N (22.48 lbf) max	
Air Leakage, Infiltration per ASTM E283 at 75 Pa (1.57 psf)	1.5 L/s/m^2 (0.29 cfm/ft^2)	1.5 L/s/m^2 (0.3 cfm/ft^2) max.	1
Canadian Air Infiltration/Exfiltration Level	A2	N/A	
Water Penetration, per ASTM E547 at 180 Pa (3.76 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E330 Deflections taken at: meeting rail +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 3.3 mm (0.13") 4.6 mm (0.18")	 Report only	 4, 5, 6
Uniform Load Deflection, per ASTM E330 Deflections taken at: bottom sash stile +1200 Pa (+25.06 psf) -1200 Pa (-25.06 psf)	 11.9 mm (0.47") 2.3 mm (0.09")	 Report only	 4, 5, 6

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TITLE OF TEST	RESULTS	ALLOWED	NOTE
Uniform Load Structural, per ASTM E330 Permanent set taken at: meeting rail			
+1800 Pa (+37.59 psf)	0.5 mm (0.02")	4.1 mm (0.16") max.	
-1800 Pa (-37.59 psf)	0.8 mm (0.03")	4.1 mm (0.16") max.	5, 6
Uniform Load Structural, per ASTM E330 Permanent set taken at: bottom sash stile			
+1800 Pa (+37.59 psf)	0.3 mm (0.01")	4.1 mm (0.16") max.	
-1800 Pa (-37.59 psf)	<0.1 mm (<0.01")	4.1 mm (0.16") max.	5, 6
Forced Entry Resistance, per ASTM F588 Type: A - Grade: 10	Pass	No entry	
Forced Entry Resistance, per CAWM 301	Pass	No entry	
Thermoplastic Corner Weld	Pass	Meets as stated	
Deglazing, per ASTM E987 Operating direction,			
320 N (70 lbf)	Pass	Meets as stated	
Remaining direction,			
230 N (50 lbf)	Pass	Meets as stated	

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 07/11/17 / Time: 10:34 AM

Note 3: With and without insect screen.

Note 4: 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 5: Loads were held for 10 seconds.

Note 6: 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 - 07/21/17
Cause for alteration – The bottom lite broke under loads
Remedial action taken – A replacement IGU was installed

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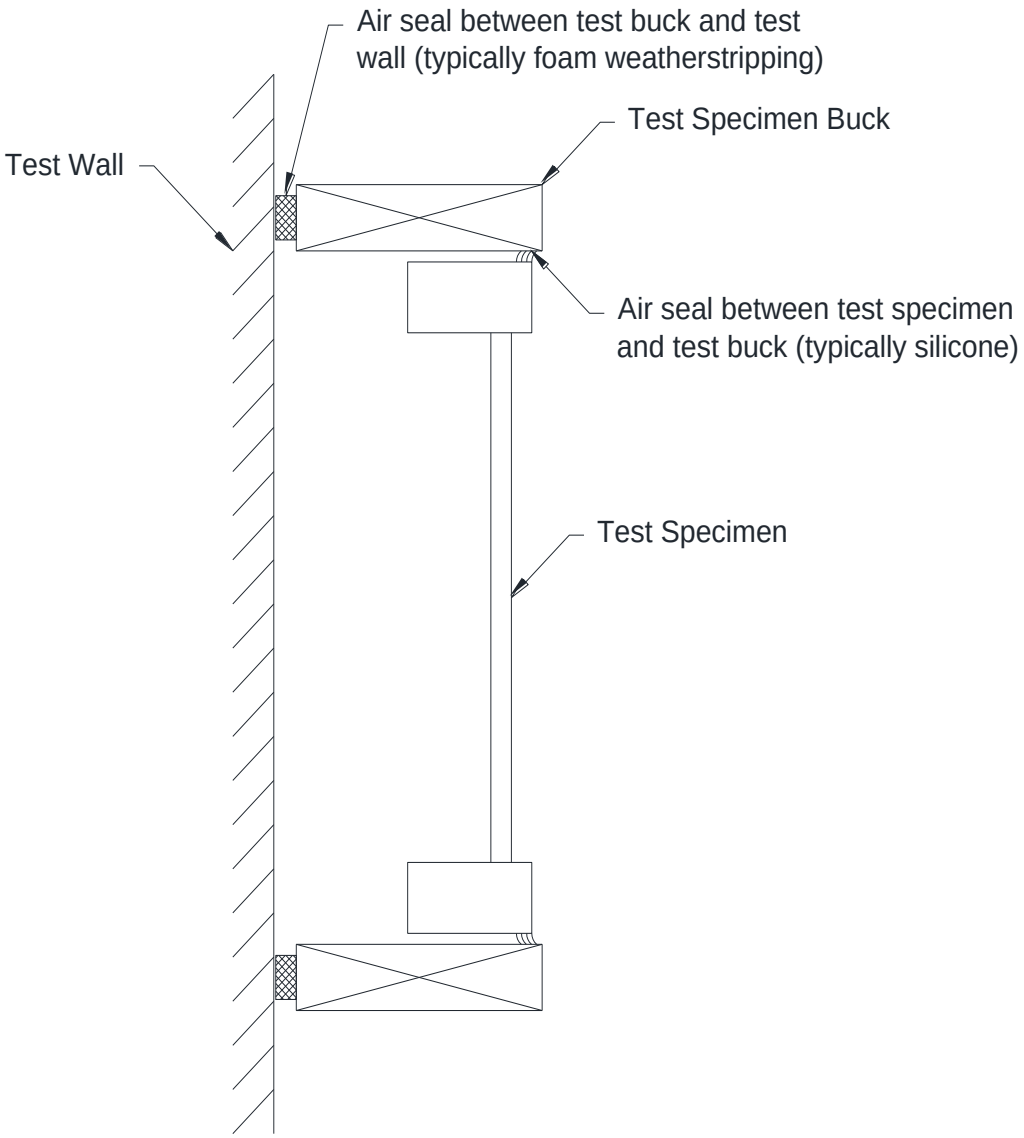
SECTION 10
LOCATION OF AIR SEAL

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 – PG25: Size Tested 1220 x 2130 (48 x 84) – Type H

And, this specimen has passed the requirements of **CAWM 301-90**

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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 drawings packet on file with Intertek B&C.*

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SECTION 13
REVISION LOG

REVISION #	DATE	PAGES	REVISION
0	09/26/17	N/A	Original Report Issue