TEST REPORT

REPORT NUMBER: 101648509COQ-001D
ORIGINAL ISSUE DATE: June 23, 2015

EVALUATION CENTER
Intertek Testing Services NA Ltd.
1500 Brigantine Drive
Coquitlam, BC V3K 7C1
Canada

RENDERED TO

WINSPIA WINDOWS (CANADA) INC.
860 BELGRAVE WAY
DELTA, BC V3M 5R8
CANADA

Product Manufacturer:	**WINSPIA Windows (Canada) Inc.**
Product Type:	**4-Panel Aluminum Folding Door System**
Overall Dimension:	**2600 mm x 2300 mm (102" x 91")**
Product Series:	***None Specified***
Evaluation Properties:	**Air Leakage Resistance, Water Penetration Resistance, Uniform Load**
Specification:	**AAMA/WDMA/CSA 101/I.S.2/A440-08**
Evaluated Performance Grade:	**Air Leakage Resistance = US – Pass; Can. – A2** **Water Penetration Resistance = PG45, 330 Pa (6.9 psf)** **Uniform Load (overall) = DP50, 2400 Pa (50.1 psf)**
Test Completion Date:	**June 13, 2014**

.

1 Table of Contents

2 Introduction

Intertek Testing Services NA Ltd. (Intertek) has conducted testing for WINSPIA Windows (Canada) Inc. on 2600 mm x 2300 mm (102.4" x 82.7") Aluminum 4-Panel Folding Door system. The system was tested for Air Leakage Resistance, Water Penetration Resistance and Uniform Load only and evaluated in accordance with AAMA/WDMA/CSA 101/I.S.2/ A440-08 *"Standard/Specification for windows, doors, and unit skylights"* (NAFS-08) following the standard methods of ASTM E283-04, *"Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen"* (ASTM E283), ASTM E331-00 *"Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Static Air Pressure Difference"* (ASTM E331) and ASTM E330-02 *"Standard Test Method for Structural Performance of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference"* (ASTM E330) Procedure A. This evaluation began on June 13, 2014 and completed on the same day.

3 Test Samples

3.1. SAMPLE AND ASSEMBLY DESCRIPTION

Type (general)		• 4-Panel Aluminum Folding Door System
Series		• None specified

Frame		• Test Buck: 2x6, #2 & better spf, box (double layer for the sill) w/ 2x12, #2 & better spf, cladding, butt joints secured with 2x #8 x 3" deck screws. The 2x12 clad was installed around the 2x6 to allow for the 8"+/-1/2" spacing between the exterior pane of the glazing unit to the exterior edge of the 2x12. The 2x12 clad was also butt jointed together with 3x #8x3" deck screws and secured to the 2x6 with #8 x3" flat head screws at every 305 mm (12").
		  ◦ Specimen to Buck: Frame was secured to the 2x6 portion of the test buck by #8 x 3-1/2" flat-head construction screws spaced approx. 610 mm (24") o.c. .
		  ◦ Silicone was used to seal all screw heads, joints of the test buck as well as between the buck and flange on the interior side
		• Material: Aluminum with thermal break
		• Corners: Butt Jointed and secured together with 3x #8 x 3" flat-head screws.
		• Reinforcement: None

Overall Size		• Width: 2600 mm (102.4") • Height: 2300 mm (82.7")
Locks and Hardware (refer to the drawings in Appendix A for Panel numbers)	**Door Panel #4**	• Hinge Stile: Three hinges along the jamb side stile, one each at the top and bottom ends and one at mid-span, secured to the panel and jamb with 4x #8 x 3/4" self-taping, flat-head screws
	Door Panel #3	• Hinge Stile: Three hinges connecting Panel #2 and 3 together, one each at the top and bottom ends and one at mid-span, secured to the panels with 4x #8 x 3/4" self-taping, flat-head screws. The top and bottom hinges attached to a roller guide for the top and bottom track.

Locks and Hardware (con't)		• Lock Stile:
		  • Handle secured to the mid-span of the stile with 2x #8 x 1/2" self-taping flat-head screws.
		  • Controls 16 mm (5/8") diameter aluminum bolt mechanism within the stile which extends into the top and bottom tracks.

	Door Panel #2	• Hinge Stile: Three hinges connecting Panel #1 and 2 together, one each at the top and bottom ends and one at mid-span, secured to the panels with 4x #8 x 3/4" self-taping, flat-head screws. The top and bottom hinges attached to a roller guide for the top and bottom track.

	Door Panel #1	• Lock / Hinge Stile:
		  • Handle secured to the mid-span of the stile with 2x #8 x 1/2" self-taping flat-head screws.
		  • Controls 16 mm (5/8") diameter aluminum bolt mechanism within the stile which extends into the top and bottom tracks.
		• Jamb Stile:
		  • Three hinges connecting Panel #1 and an interlock bar together, one each at the top and bottom ends and one at mid-span, secured to the panels with 4x #8 x 3/4" self-taping, flat-head screws. The top and bottom hinges attached to a roller guide for the top and bottom track.
		  • Interlock Bar: Aluminum approx. 45 mm wide by 2190 mm high. This bar slides

Drainage		• Four drain slots, 25 mm x 6 mm (1" x 1/4"), within the sill track located approx. 102 mm (4"), 940 mm (37"), 1626 mm (64") and 2489 mm (98") o.c. from the primary leaf jamb corner. • Four weep slots, 32 mm x 6 mm (1-1/4" x 1/4"), on exterior face of the sill located approx. 229 mm (9"), 1118 mm (44"), 1486 mm (58-1/2") and 2413 mm (95") o.c. from the primary leaf jamb corner.

Leaf Description (all)		• Material: Aluminum with thermal break
		• Corners: Mitred and joined using corner coupling insert
		• Panel Size:
		  • Width: 600 mm (23.6")
		  • Height: 2190 mm (86.2")
		• Reinforcement: None.

Weather-strip		• Main Frame:
		  • Pile with a perforated jacket type of weather-strip around the interior most, exterior facing perimeter.
		  • Two lengths of EPDM gasket along both jambs, one length on each of the interior and exterior sides of the track.
		• Panels (all):
		  • EPDM gasket around the perimeter of the interior and exterior edges of the stiles and the exterior edge of the top and bottom rails.

Glazing (all)		• IGU specification:
		  • 6 mm / 6 mm clear heat strengthened with a 13 mm aluminum tube spacer with desiccant, all sealed using hot melt poly butyl.
		  • Overall thickness, 25 mm (1")

	• Interior glazed, on top of an EPDM gasket perimeter with structural silicone at the corners. • Glazing Blocks: 3 mm thick; 1x at the corners of each member within 76 mm (3") from the corners • Glazing Stops: Extruded aluminum with “push-in” gasket
Drawings	• Copy of drawings supplied by WINSPIA Windows (Canada) Inc. included in Appendix A.

4 Testing and Evaluation Methods

4.1. AIR LEAKAGE RESISTANCE

The Air Leakage Resistance test was performed in accordance with ASTM E283. Air infiltration and exfiltration tests were performed using test pressures of 75 Pa (1.57 psf). The maximum air leakage rate was calculated and compared to the allowable air leakage.

4.2. WATER PENETRATION RESISTANCE

A static Water Penetration Resistance test was also performed in accordance with ASTM E331. The test was performed using the specified pressure differential and a water spray rate of at least 204 L/m^2 per hour (5.0 U.S. gal/ft^2 per hour). The duration of the test was 15 minutes, during which the air pressure and water spray was continuously applied.

4.3. UNIFORM LOAD DEFLECTION

The Uniform Load Deflection tests were conducted in accordance with ASTM E330, Procedure A. The tests were performed in both the positive and negative directions. After a 10 second preload (50% of the test load), followed by 1 minute with the pressure released, the tests were conducted at the specified test pressure for a period of 10 seconds. After the test loads were released, the window was inspected for failure or permanent deformation of any part of the window system that would cause any malfunction. Polyethylene film was not used.

4.4. UNIFORM LOAD STRUCTURAL

A Uniform Load Structural was conducted in accordance with ASTM E330, Procedure A. After a 10 second preload (50% of test load), followed by 1 minute with the pressure released, the sample was subjected to a Uniform Load Structural test using a specified test pressure for a time of 10 seconds. The test was performed in both the positive and negative directions. After the test loads were released, the window was inspected for failure or permanent deformation of any part of the window system that would cause any malfunction. Polyethylene film was used.

4.5. DEVIATION FROM STANDARD METHOD

Uniform Load

The residual deflection limit was based on the L*0.4% limit for Class R and LC products.

5 Test Apparatus

Equipment used during testing is listed as follows:

Test	Equipment	Intertek ID#
Air Leakage Resistance, Water Penetration Resistance, and Uniform Load Deflection / Structural	Fenestration Testing Control Unit	60650
	Water spray assembly	60651
		60652
		60653

6 Testing and Evaluation Results

6.1. AIR LEAKAGE

Air test data is indicated in the following table:

Area:	5.98 m^2 (64.37 ft^2)
Infiltration rate:	0.997 L/s*m^2, 0.196 cfm/ft^2
Exfiltration rate:	0.743 L/s*m^2, 0.146 cfm/ft^2
Maximum allowable air leakage (US):	1.5 L/s*m^2, 0.3 cfm/ft^2
Maximum allowable air leakage (CAN – A2):	1.5 L/s*m^2, 0.3 cfm/ft^2

The overall system **met** the US performance requirements as well as the **A2** Canadian performance requirements when evaluated under NAFS-08.

6.2. WATER PENETRATION

During 24-minute test period, using a pressure differential of 330 Pa (6.9 psf), there was no water leakage observed. The system **met** the **PG45** Water Penetration Resistance performance requirements when evaluated to NAFS-08 as well as to A440S1-09, the Canadian Supplement to NAFS.

6.3. UNIFORM LOAD DEFLECTION

Primary Leaf Uniform Load Deflection data:

Test Pressure, Pa (psf)	Deflection Measurements, mm (in.)				Compliance
	Positive		Negative		
	Deflection	*Residual*	*Deflection*	*Residual*	
2400 (50.1)	8.65 (0.34)	1.66 (0.07)	26.85 (1.06)	5.77 (0.23)	Pass **DP50**
Jamb Stile span, L = 2160 mm (85.04")			Deflection limit, L/175 = N/A		

Stile (deflection taken on Door #2 on the stile closest to Door #3) Uniform Load Deflection data:

Test Pressure, Pa (psf)	Deflection Measurements, mm (in.)				Compliance
	Positive		Negative		
	Deflection	*Residual*	*Deflection*	*Residual*	
2400 (50.1)	22.28 (0.88)	0.59 (0.02)	24.45 (0.96)	0.22 (0.01)	Pass **DP50**
Stile span, L = 2390 mm (94.09")			Deflection limit, L/175 = N/A		

After the test loads were released, the specimen was inspected and there was found to be no failure or permanent deformation of any part of the window system that would cause any operational malfunction. The system **met** the **DP50** Uniform Load Deflection performance requirements when evaluated under NAFS-08.

6.4. UNIFORM LOAD STRUCTURAL

Primary Leaf Uniform Load Structural test data:

Test Pressure, Pa (psf)	Residual Deflection Measurements, mm (in.)		Compliance
	Positive	Negative	
3600 (75.2)	1.29 (0.05)	0.31 (0.01)	Pass **DP50**
Jamb Stile span, L = 2160 mm (85.04")		Residual deflection limit, L*0.4% = 9.56 mm (0.38")	

Stile (deflection taken on Door #2 on the stile closest to Door #3) Uniform Load Deflection data:

Test Pressure, Pa (psf)	Residual Deflection Measurements, mm (in.)		Compliance
	Positive	Negative	
3600 (75.2)	2.16 (0.08)	0.41 (0.02)	Pass **DP50**
Stile span, L = 2390 mm (94.09")		Residual deflection limit, L*0.4% = 9.56 mm (0.38")	

After the test loads were released, the specimen was inspected and there was found to be no failure or permanent deformation of any part of the window system that would cause any operational malfunction. The system **met** the overall **DP50** Uniform Load performance requirements when evaluated under NAFS-08.

7 Conclusion

The Aluminum 4-Panel Folding Door system tested and described herein achieved the following performance requirements for Air Leakage Resistance, Water Penetration Resistance and Uniform Load when evaluated in general accordance with NAFS-08.

Evaluation Property	**Results**
Air Leakage Resistance	US – Pass Can. – A2
Water Penetration Resistance	PG45, 330 Pa (6.9 psf)
Uniform Load Resistance	Overall – DP50 Positive – 2400 Pa (50.1 psf) Negative – 2400 Pa (50.1 psf)

INTERTEK TESTING SERVICES NA LTD.

Reported by: _____
Dave Park
Technician – Building Products

Reviewed by: _____
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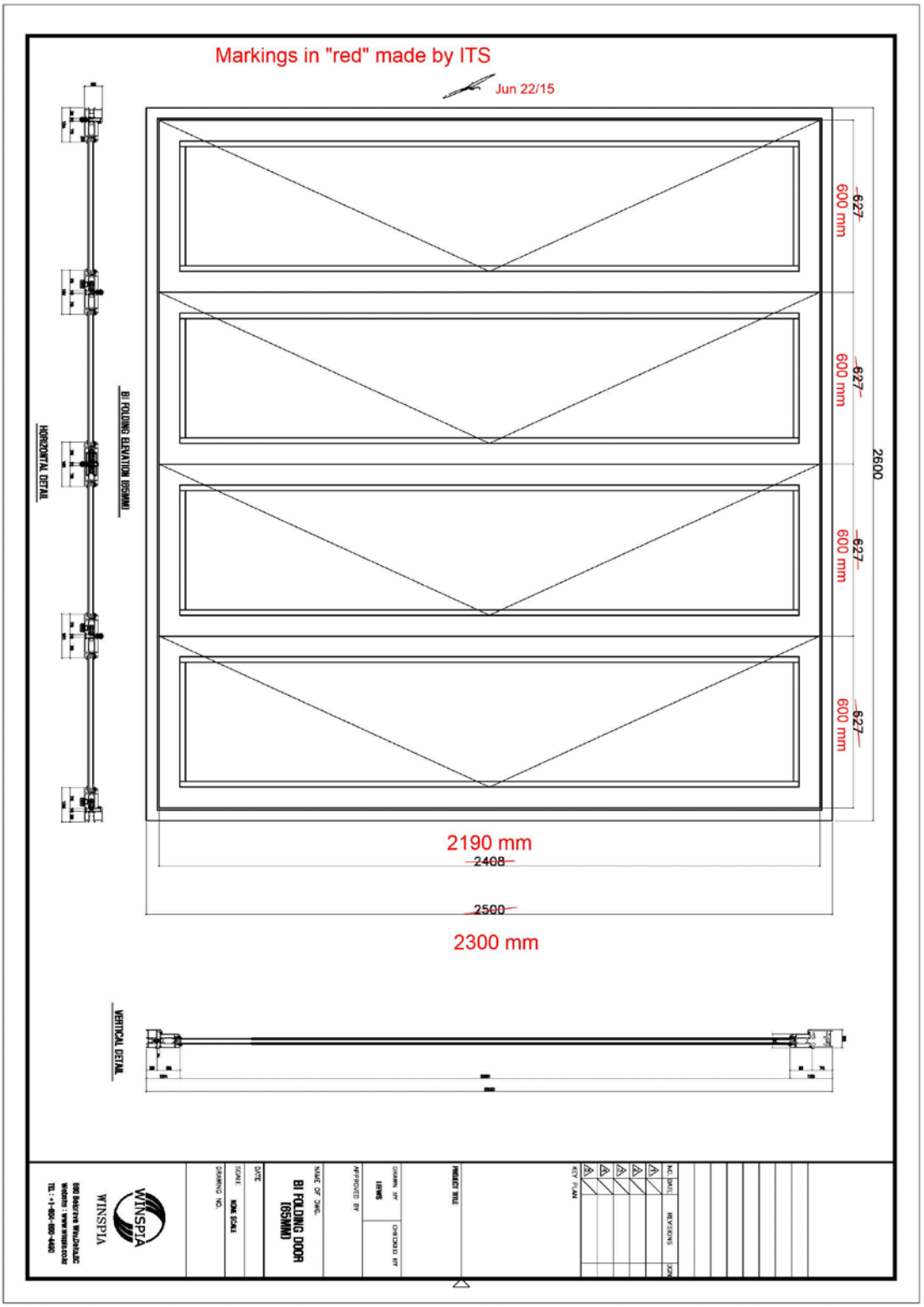
Manager – Building Products

APPENDIX A

Drawings – 1 Page

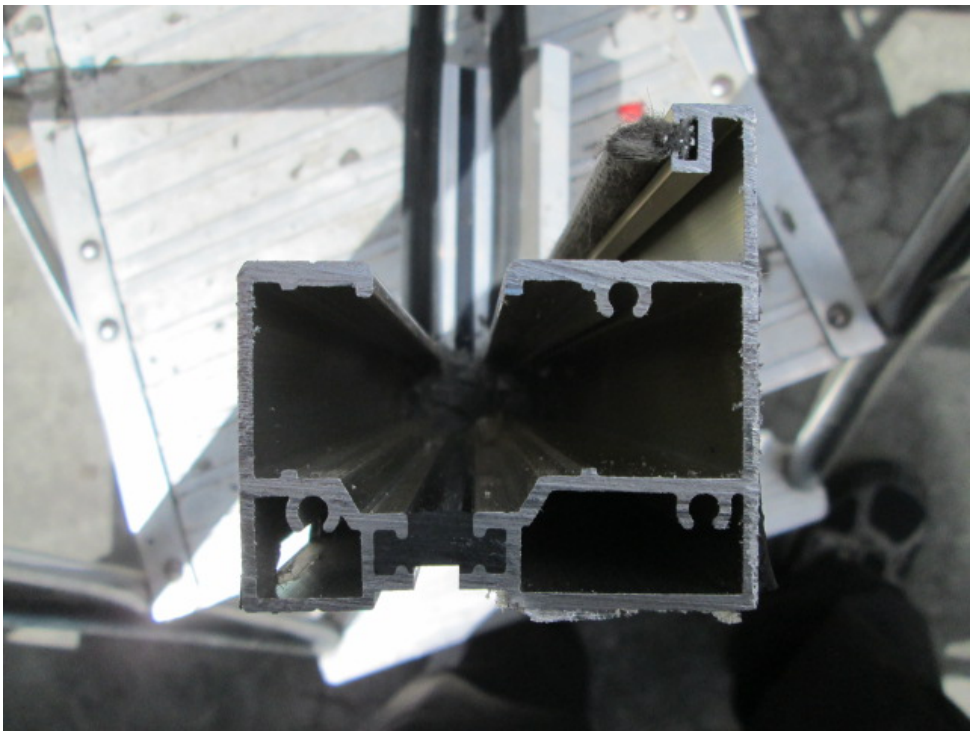

Markings in "red" made by ITS
Jun 22/15
627
600 mm
627
600 mm
627
600 mm
627
600 mm
2600
2190 mm
2408
2500
2300 mm
BI FOLDING ELEVATION DRAWING
HORIZONTAL DETAIL
VERTICAL DETAIL
WINSPIA
BI FOLDING DOOR
(65MM)

APPENDIX B

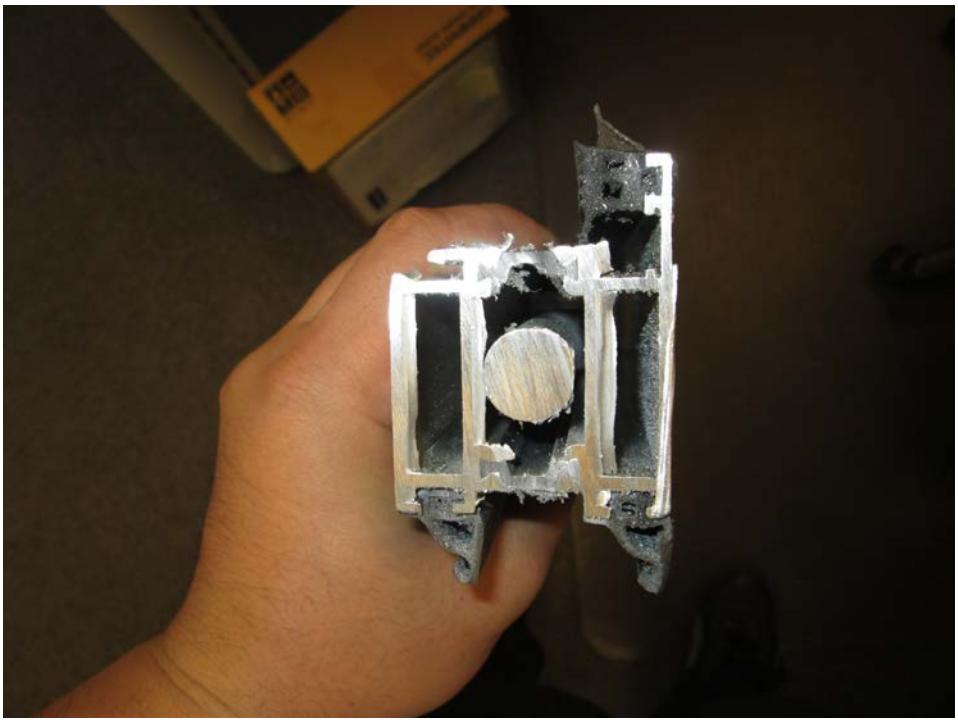
Photographs – 1 Page

Aluminum 4-Panel Folding Door System – Exterior View

Aluminum 4-Panel Folding Door System – Interior View



Head Track



Panel Stile – Primary Lock Stile

APPENDIX C

Revision Table – 1 Page

Revision Table				
Date	**Section**	**Description**	**Technician**	**Reviewer**
Jul 23/15	---	Original Issue Date	----	---