

TEST REPORT

Report No.: B9474.03-750-44

Rendered to:

SILEX FIBERGLASS WINDOWS & DOORS
Winnipeg, Manitoba

PRODUCT TYPE: Fibreglass Casement Window
SERIES/MODEL: 2100 Series

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

Title	Summary of Results
Primary Product Designator	Class CW – PG90 – Size Tested 800 x 1500 mm (31 x 59 in) – Type C
Design Pressure	±4320 Pa (±90.23 psf) CSA A440-00 Equivalent Rating = C5
Air Infiltration	<0.1 L/s/m ² (<0.02 cfm/ft ²)
Canadian Air Infiltration/Exfiltration Level	A3
Water Penetration Resistance Test Pressure	730 Pa (15.25 psf) CSA A440-00 Equivalent Rating = B7

Test Completion Date: 05/23/2012

Reference must be made to Report No. B9474.03-750-44, dated 05/28/12 for complete test specimen description and detailed test results.

1.0 Report Issued To: Silex Fiberglass Windows & Doors
15-1865 Sargent Avenue
Winnipeg, Manitoba R3H 0E4

2.0 Test Laboratory: Architectural Testing Canada, Inc.
356 Saulteaux Crescent
Winnipeg, Manitoba R3J 3T2
(204) 885-9300

3.0 Project Summary:

3.1 Product Type: Fibreglass Casement Window

3.2 Series/Model: 2100 Series

Compliance Statement: Results obtained are tested values and were secured by using the designated test method. The specimen tested successfully met the performance requirements for a **Class CW - PG90 - Size Tested 800 x 1500 mm (31 x 59 in) - Type C** rating.

3.3 Test Dates: 05/17/2012 - 05/23/2012

3.4 Test Record Retention End Date: All test records for this report will be retained until May 23, 2016.

3.5 Test Location: Architectural Testing Canada test facility in Winnipeg, Manitoba.

3.6 Test Sample Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Architectural Testing Canada for a minimum of four years from the test completion date.

3.7 Drawing Reference: The test specimen drawings have been reviewed by Architectural Testing Canada and are representative of the test specimen reported herein. Test specimen construction was verified by Architectural Testing Canada per the drawings located in Appendix B. Any deviations are documented herein or on the drawings.

3.8 List of Official Observers:

<u>Name</u>	<u>Company</u>
Zhen Liu	Silex Fiberglass Windows & Doors
Bryan Boyle	Architectural Testing Canada, Inc.
Jack Guerreiro	Architectural Testing Canada, Inc.

4.0 Test Specification:

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

5.0 Test Specimen Description:

5.1 Product Sizes:

Overall Area: 1.2 m ² (12.9ft ²)	Width		Height	
	millimeters	inches	millimeters	inches
Overall size	800	31-1/2	1500	59
Sash	755	29-3/4	1455	57-1/4

5.2 Frame Construction:

Frame Member	Material	Description
All	Fibreglass	Head, sill and jamb members were white fiberglass, each filled with three continuous length EPS foam inserts.

	Joinery Type	Detail
All corners	Mitered	All frame corners were mitre cut and secured with corner keys.

5.3 Sash Construction:

Sash Member	Material	Description
All	Fibreglass	All rails and stiles were white fiberglass, each filled with one continuous length EPS foam insert.

	Joinery Type	Detail
All corners	Mitered	All sash corners were mitre cut and secured with corner keys.

5.0 Test Specimen Description: (Continued)

5.4 Weatherstripping:

Description	Quantity	Location
Foam filled vinyl bulb (white)	1 row	Perimeter of frame
Foam filled vinyl bulb (black)	1 row	Perimeter of frame
Foam filled vinyl bulb (white)	1 row	Perimeter of sash

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

Glass Type	Spacer Type	Interior Lite	Exterior Lite	Glazing Method
25 mm IG	Foam super spacer	3 mm annealed	3 mm annealed	Tape-glazed, with glass set from the interior. Silicone sealant was installed around the perimeter of the interior glazing pane. Snap-in vinyl stops were utilized on the interior. A silicon cap bead was installed to the exterior perimeter of the exterior glazing pane.

Location	Daylight Opening		Glass Bite
	millimeters	inches	
Operable sash	645 x 1345	25-1/2 x 53	12 mm

5.6 Drainage:

Drainage Method	Size	Quantity	Location
Weep holes	5 mm diameter	2	On the underside of the operable sash, 75 mm (3") from the sash corners.

5.0 Test Specimen Description: (Continued)

5.7 Hardware:

Description	Quantity	Location
Roto operator assembly	1	Operator cover and handled set was located on the interior sill, 450 mm (17-3/4") from the lock jamb corner. The operator was located on the frame sill and secured with six #8 x 5/8" screws. The operator track and clip were located on the bottom rail of the sash and secured with three #8 x 5/8" screws.
Lock assembly	1	Lock located on the frame lock jamb, 1205 mm (47-1/2") from the top of the frame. The lock support plate was secured to the frame with two #8 x 5/8" screws.
Hinges	2	Hinges were located on the top and bottom rails of the sash and each secured with four #8 x 5/8" screws. The hinge tracks were located at the corresponding location on the frame head and sill and each secured with four #7 x 1/2" screws.
Snubbers	4	Two snubbers were located on the sash snubber stile at 480 mm (19") and 935 mm (36-3/4") from the top of the sash, and two snubbers were located at the corresponding location on the frame hinge jamb. Each snubber was secured with two #8 x 5/8" screws.
Keepers	3	Three keepers were located on the sash keeper stile, 135 mm (5-1/4"), 740 mm (29") and 1430 mm (56-1/4") from the top of the sash.

5.8 Reinforcement: No reinforcement was utilized.

6.0 Installation:

The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 10 mm (3/8") shim space. The rough opening was filled with urethane foam insulation and the interior and exterior perimeters of the window were sealed with caulked sealant.

Location	Anchor Description	Anchor Location
Frame	#8 x 3" screws	Commencing between 45 mm (1-3/4") and 135 mm (5-1/4") from corners, fasteners were secured through the frame and into the buck 250 mm (9-3/4") to 570 mm (22-1/2") on centre.
Buck	#8 x 3" screws	Commencing 285 mm (11-1/4") from the top of the buck, three fasteners were secured through the buck and into the frame 300 mm (11-3/4") to 450 mm (17-3/4") on centre.

7.0 Test Results: The temperature during testing was 20°C (68°F). The results are tabulated as follows:

Title of Test	Results	Allowed	Note
Operating Force, per ASTM E 2068	Initiate motion: 13 N (3 lbf) Maintain motion: 4 N (1 lbf) Latches: 67N (15 lbf)	60 N (13 lbf) max. 30 N (7 lbf) max. 100 N (23 lbf) max.	
Air Leakage, Infiltration per ASTM E 283 at 75 Pa (1.57 psf)	<0.1 L/s/m ² (<0.02 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Air Leakage, Exfiltration per ASTM E 283 at 75 Pa (1.57 psf)	<0.1 L/s/m ² (<0.02 cfm/ft ²)	1.5 L/s/m ² (0.3 cfm/ft ²) max.	1
Canadian Air Infiltration/Exfiltration Level	A3	N/A	
Water Penetration, per ASTM E 547	N/A	N/A	3

**7.0 Test Results:** (Continued)

Title of Test	Results	Allowed	Note
Uniform Load Deflection, per ASTM E 330	N/A	N/A	3
Uniform Load Structural, per ASTM E 330	N/A	N/A	3
Forced Entry Resistance, per ASTM F 588 Type: B - Grade: 10	Pass	No entry	
Sash Vertical Deflection 270 N (60 lbf)	0.8 mm (0.03")	15.2 mm (0.60") max.	
Distributed Load 300 Pa (6.27 psf)	Pass	No damage	
Optional Performance			
Water Penetration, per ASTM E 547 at 730 Pa (15.25 psf)	Pass	No leakage	2
Uniform Load Deflection, per ASTM E 330 taken at hinge stile +4320 Pa (+90.23 psf) -4320 Pa (-90.23 psf)	2.3 mm (0.09") 3.8 mm (0.15")	7.4 mm (0.29") max. 7.4 mm (0.29") max.	4, 5
Uniform Load Structural, per ASTM E 330 taken at hinge stile +6480 Pa (+135.34 psf) -6480 Pa (-135.34 psf)	<0.3 mm (<0.01") <0.3 mm (<0.01")	3.8 mm (0.15") max. 3.8 mm (0.15") max.	4, 5

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: Without insect screen.

Note 3: The client opted to start at a pressure higher than the minimum required. Test results are reported under Optional Performance.

Note 4: Loads were held for 10 seconds.

Note 5: 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.

Architectural Testing Canada 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 Canada, Inc. for the entire test record retention period.

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 Canada Inc.

For ARCHITECTURAL TESTING CANADA, Inc.



Digitally Signed by: Jack Guerreiro

Jack Guerreiro
Senior Technician



Digitally Signed by: Bryan Boyle

Bryan Boyle
Director, Regional Operations

BJB:bb

Attachments (pages): This report is complete only when all attachments listed are included.

Appendix-A: Alteration Addendum (1)

Appendix-B: Drawings (3)

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
1	10/01/12	1	Revision includes correcting the individuals witnessing the test.



Appendix A

Alteration Addendum

- Alteration #1:** Date - 05/17/12
Cause for alteration - Water leakage during ASTM E 547 test at 730 Pa.
Remedial action taken - Additional silicone sealant applied to the corner of the frame sill and at the corners of the hollow bulb weatherstrip.
- Alteration #2:** Date - 05/18/12
Cause for alteration - Water leakage during ASTM E 547 test at 730 Pa.
Remedial action taken - Corners of the foam filled vinyl bulb weatherstrip on the sash were trimmed back approximately 25 mm (1").



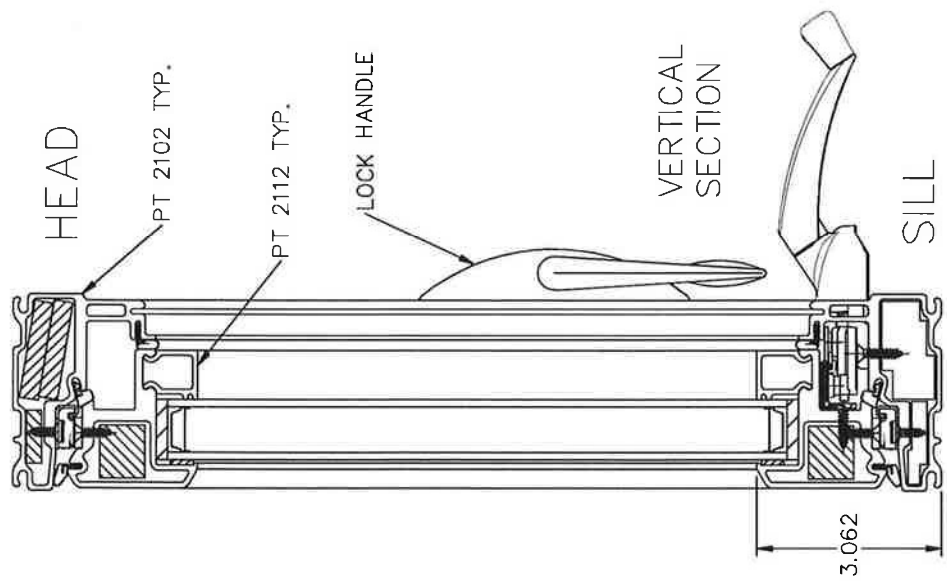
Architectural Testing

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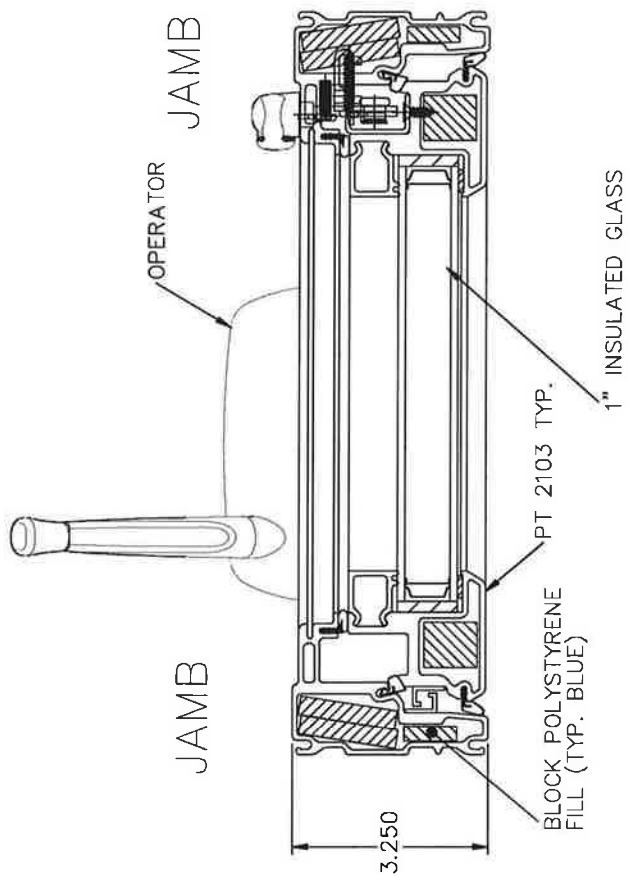
Report Date: 05/28/12

Appendix B

Drawings



VERTICAL SECTION



HORIZONTAL SECTION



Test sample complies with these details. Revisions are noted.

Report # B9474.03-710-44

Date 05/25/12 Tech (RB)

NO	DATE	BY	REVISIONS	NO	DATE	BY	REVISIONS	APPROVAL	MATERIAL
1	7-15-08	ALH	UPDATED FRAME PROFILE	7				TYPICAL WALL =	<p>SILEX FIBERGLASS 19-1805 Bergant Ave Birmingham, AL 35201 054 Tel: 204 788 0408 Fax: 204 788 0409</p>
2	9-30-08	ALH	PT2112 WAS PT2102	8				BREAK SHARP CORNERS =	
3	11-19-08	ALH	ADDED EPS FOAM FILL IN FRAM & SASH	9				EXCEPT AS NOTED	
4				10				WT./FT =	
5				11				PERIMETER =	
6				12				TOLERANCES	
								EXCEPT AS NOTED	
								DECIMAL ± .010	
								FRACTIONAL ± 1/32"	
								ANGULAR ± 2°	

TYPICAL CROSS SECTION FIBERGLASS CASEMENT
SCALE: 5
DATE: 1-9-2012
DRAWN BY: JR
2100-100