Architectural Testing

# TEST REPORT

**Report No.**: B9474.02-750-44

**Rendered to**:

SILEX FIBERGLASS WINDOWS & DOORS
Winnipeg, Manitoba

**PRODUCT TYPE**: Fibreglass Awning 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 1200 x 900 mm (47 x 35 in) – Type AP |
| Design Pressure | ±4320 Pa (±90.23 psf)<br>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)<br>CSA A440-00 Equivalent Rating = B7 |

**Test Completion Date**: 05/28/2012

Reference must be made to Report No. B9474.02-750-44, 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 Awning 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 1200 x 900 mm (47 x 35 in) – Type AP** rating.

**3.3 Test Dates**: 05/16/2012 - 05/24/2012

**3.4 Test Record Retention End Date**: All test records for this report will be retained until May 24, 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**:

| Name | Company |
|---|---|
| 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:** 1.1 $m^2$ (11.6 $ft^2$) | **Width** | | **Height** | |
|---|---|---|---|---|
| | **millimeters** | **inches** | **millimeters** | **inches** |
| Overall size | 1200 | 47-1/4 | 900 | 35-1/2 |
| Sash | 1150 | 45-1/4 | 850 | 33-1/2 |

### 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 | 1042 x 742 | 41 x 29-1/4 | 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 handle set was located on the interior sill, 550 mm (21-3/4") from the frame corner, 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 four #8 x 5/8" screws. |
| Lock assembly | 2 | Locks were located on the frame jambs, 625 mm (24-1/2") from the top of the frame. The lock support plate was secured to the frame with four #8 x 5/8" screws. |
| Hinges | 2 | Hinges were located on the left and right sash stiles and each secured with four #8 x 5/8" screws. The hinge tracks were located at the corresponding location on the frame jambs and each secured with six #7 x 1/2" screws. |
| Snubbers | 6 | Three snubbers were located on the top snubber rail of the sash at 80 mm (3-1/4"), 545 mm (21-1/2"), and 1025 mm (40-1/2") from the corner of the sash, and three snubbers were located at the corresponding location on the frame head. Each snubber was secured with two #8 x 5/8" screws. |
| Keepers | 4 | Two keepers were located on each of the left and right sash keeper stiles, 460 mm (18") and 730 mm (28-3/4") 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 40 mm (1-1/2") and 480 mm (19") from corners, fasteners were secured through the frame and into the buck 245 mm (9-3/4") to 590 mm (23-1/4") on centre. |
| Buck | #8 x 3" screws | Commencing between 140 mm (5-1/2") and 255 mm (10") from corners, two fasteners each were secured through the buck and into the frame on the jambs and sill 500 mm (19-3/4") to 785 mm (31") on centre. At the head, one fastener was secured through the buck and into the frame 1165 mm (45-3/4") from the corner. |

**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)<br>Maintain motion: 18 N (4 lbf)<br>Latches: 93 N (21 lbf) | 60 N (13 lbf) max.<br>30 N (7 lbf) max.<br>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 |

**7.0 Test Results**: (Continued)

| Title of Test | Results | Allowed | Note |
|---|---|---|---|
| **Canadian Air Infiltration/Exfiltration Level** | A3 | N/A | |
| **Water Penetration,** per ASTM E 547 | N/A | N/A | 3 |
| **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 | |
| **Awning, Hopper, Projected Hardware Load Test** 140 N (30 lbf) | 3.3 mm (0.13") | 38.1 mm (1.50") | |
| **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<br>+4320 Pa (+90.23 psf)<br>-4320 Pa (-90.23 psf) | <br>0.8 mm (0.03")<br>3.0 mm (0.12") | <br>5.8 mm (0.23") max.<br>5.8 mm (0.23") max. | <br><br>4, 5 |
| **Uniform Load Structural,** per ASTM E 330 taken at hinge stile<br>+6480 Pa (+135.34 psf)<br>-6480 Pa (-135.34 psf) | <br><0.3 mm (<0.01")<br><0.3 mm (<0.01") | <br>3.0 mm (0.12") max.<br>3.0 mm (0.12") max. | <br><br>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.*

**7.0 Test Results**: (Continued)

*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

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

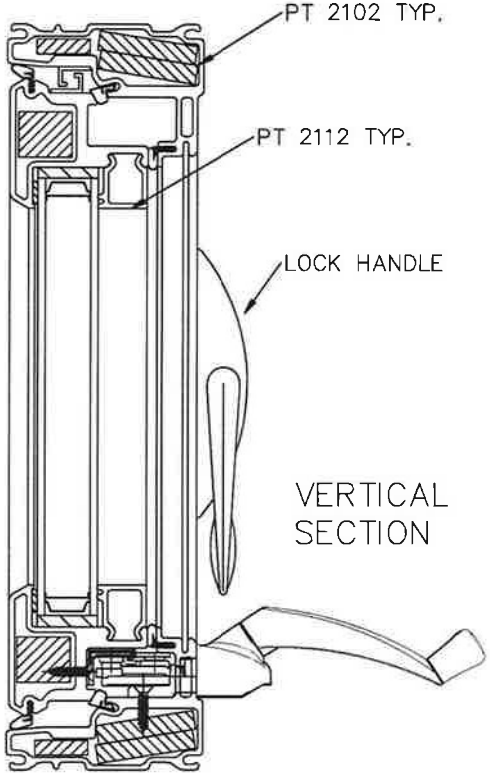
## Appendix A

## Alteration Addendum

**Alteration #1**: Date - 05/17/12
Cause for alteration - Water leakage during ASTM E 547 test at 730 Pa.
Remedial action taken – Corners of the foam filled vinyl bulb weatherstrip on the sash were trimmed back approximately 25 mm (1").

# Appendix B
# Drawings

HEAD




SILL

Architectural Testing

Test sample complies with these details.
Deviations are noted.

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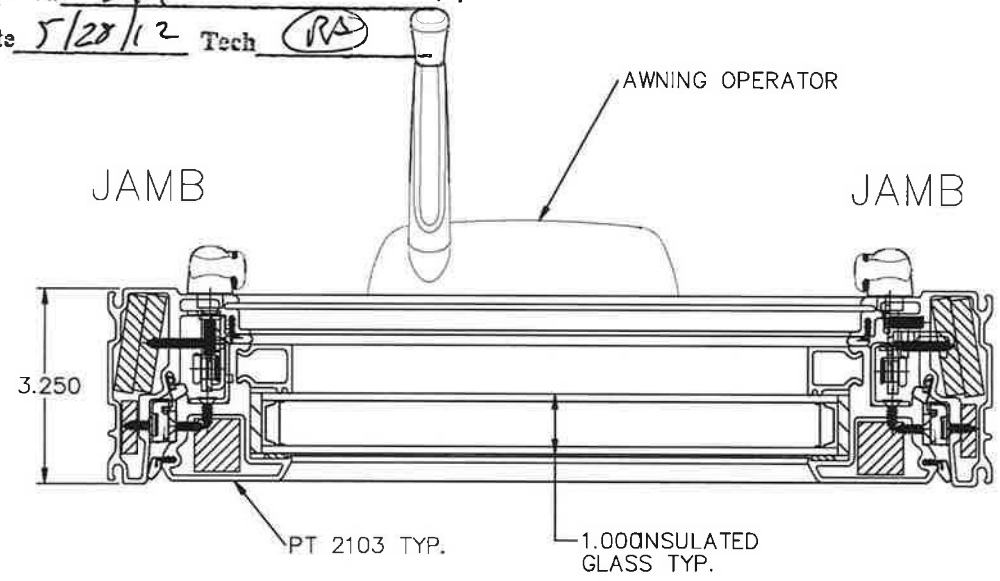
Date 5/28/12 Tech RA




HORIZONTAL SECTION

| NO. | DATE | BY | REVISIONS | NO. | DATE | BY | REVISIONS |
|---|---|---|---|---|---|---|---|
| 1 | 7-15-08 | ALH | UPDATED FRAME PROFILE | 7 | | | |
| 2 | 9-30-08 | ALH | PT2112 WAS PT2102 | 8 | | | |
| 3 | 03-10-10 | JJG | ADDED EPS FOAM FILL IN FRAM & SASH | 9 | | | |
| 4 | | | | 10 | | | |
| 5 | | | | 11 | | | |
| 6 | | | | 12 | | | |

PRINT APPROVAL

ENGINEERING MANAGER

MATERIAL: AS NOTED

TYPICAL WALL = N/A (EXCEPT AS NOTED)

BREAK SHARP CORNERS = N/A (EXCEPT AS NOTED)

WT./FT = N/A

PERIMETER = N/A

TOLERANCES (EXCEPT AS NOTED)

DECIMAL ± .010

FRACTIONAL ± 1/32"

ANGULAR ± 2°

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Tel: 204 788 0648
Fax: 204 788 0649

SCALE: .5X

DATE: 1-9-2012

DRAWN BY: JERRY

TYPICAL CROSS SECTION FIBERGLASS AWNING

2100-104