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CAN-BEST
Established 1985

TEST REPORT

Performance Evaluation of
Fixed Window
"TYPE A 500 R.S."
Performed in Accordance with:
AAMA/WDMA/CSA101/I.S.2/A440-11
& CSA A440S1-09

Report No.: L17-540-4878
Report Date: June 9, 2017

Prepared for:
Falbo Aluminum Products
66 Rivalda Rd.
Toronto, ON M9M 2M3
Canada

Overall Performance Rating

Class CW-PG3120: Size tested 1981 mm x 1981 mm-Type FW
Class CW-PG65: Size tested 77.99 in x 77.99 in-Type FW
Positive Design Pressure: 3120 Pa (65.16 psf)
Negative Design Pressure: 3120 Pa (65.16 psf)
Water Penetration Resistance: 720 Pa (15.04 psf)
Canadian Air Infiltration/Exfiltration: Fixed
Forced Entry Resistance: Grade 40

Respectfully submitted by:

CANADIAN BUILDING ENVELOPE
Science and Technology (CAN-BEST)

Tests Supervised by:

James R. Scott, P.Eng.
Test Supervisor

Person in Responsible Charge:

Elie Alkhoury, M.Eng. (Building Science), P.Eng.
Director, Research and Testing Services

1. *This report does not constitute certification of the test product. The reported test results refer only to the specimen tested. No representation is made that other samples of similar design will feature like performance.*
2. *This report was prepared for the consideration of the addressee only. It shall not be used by any other party without the written consent of CAN-BEST.*
3. *This report may not be reproduced or quoted in partial form without the approval of CAN-BEST.*

1. INTRODUCTION

Canadian Building Envelope Science and Technology (CAN-BEST) was retained by Falbo Aluminum Products to test one Fixed Window. Testing was conducted in accordance with the performance requirements outlined in AAMA/WDMA/CSA101/I.S.2/A440-11 'North American Fenestration Standard/Specification for Windows, Doors, and Skylights'. Where applicable, testing was carried out in accordance with the corresponding ASTM standard test method or the CSA A440 S1-09 'Canadian Supplement to AAMA/WDMA/CSA101/I.S.2/A440 North American Fenestration Standard/ Specification for windows, doors, and skylights'

This report covers tests carried out on one specimen of specific dimensions. Product performance is affected by variations in its dimensions, assembly details and installation method. The reader is advised to ensure product conformity with all the details of the test sample described in the following section.

No conclusions regarding glass structural performance may be drawn from the reported results.

2. SAMPLE DESCRIPTION

Designation:	"TYPE A 500 R.S."	
Type:	Fixed Window, 1981 mm wide by 1981 mm high (77.99 in by 77.99 in)	
Sampling:	Sampling of the test specimen was carried out by the Client.	
Specimen Details:	Details of specimen construction as provided by the client and verified by CAN-BEST are included in Appendix A. (1 page)	
Drawings:	*Elevation*	*1 page*
	Vertical and horizontal sections	*1 page*
	Bill of materials	*1 page*
	Copy of the above drawing(s), stamped "Canadian Building Envelope Science and Technology", is enclosed with this report.	

3. TEST RESULTS

Detailed test results are presented in Tables (1.1) and (1.2) for the Gateway and Optional Performance requirements respectively.

Notes:

1. This report does not constitute certification of this product, which may only be granted by an Accredited Certification Agency.

2. The reported results were secured by using the designated test methods and they (DO) indicate compliance with the performance requirements of the referenced publication.

3. The product tested is detailed in drawings, which were supplied by the manufacturer and annexed to this report. Any other descriptions were supplied verbally by the manufacturer. The general descriptions in this report are for reference only.

TABLE (1.1): Test Results, Gateway Performance Requirements **Class CW-PG30-FW**
Gateway Size: 1500 mm x 1500 mm (59.1 in x 59.1 in)
Test Size: 1981 mm x 1981 mm (77.99 in x 77.99 in)

Test Start Date: May 26, 2017 Test Finish Date: May 26, 2017

Test	Specifications	Test Results	Rating
Air Leakage Resistance **9.3.2** *ASTM E283*	Rate of air leakage shall be less than or equal to the following: *l/s/m² (cfm/ft²)* *Cdn A2 (Inf./Exf.)* 1.5 (0.30) *Cdn A3 (Inf./Exf.)* 0.5 (0.10) *Cdn Fixed (Inf./Exf.)* 0.2 (0.04) Test Pressure, Pa (psf): 75 (1.57)	Surface Area, m^2 (ft^2) 3.924 (42.24) Measured Air Flow, l/s (cfm): *Infiltration:* 0.19 (0.40) *Exfiltration:* 0.20 (0.42) Rates of Air Flow, l/s/m^2 (cfm/ft^2): *Infiltration:* 0.05 (0.01) *Exfiltration:* 0.05 (0.01)	**PASS** Canadian **Fixed**
Water Resistance **9.3.3** *ASTM E 547*	No leakage past innermost plane following four pressure cycles, each five minutes "ON" and one minute "OFF". Test Pressure, Pa (psf): 220 (4.59) *(Equivalent to wind speed of 42 mph)*	No leakage past innermost plane was observed. ***Test*** ***Result*** *4 cycles* *OK*	**PASS**
Uniform Load Deflection **9.3.4.2** *ASTM E 330*	Maximum net deflection shall not be more than 1/175 of its span, or 11.3 mm (0.45 in) under the following design pressure: Test Pressure, Pa (psf): 1440 (30.08) *(Equivalent to wind speed of 108 mph)*	Measured net deflections, mm (in): Span = 1980 (77.95) *Inward:* 0.5(0.020) *Outward:* 0.7(0.028)	**PASS**
Uniform Load Structural **9.3.4.3** *ASTM E 330*	No glass breakage or permanent damage to window components at the following test pressure, Pa(psf). Net Permanent Deflection to be less than 0.3% of span, or 5.9 mm (0.234 in). Test Pressure, Pa (psf): 2160 (45.11) *(Equivalent to wind speed of 0 mph)*	Measured net permanent deflection of Jamb, mm (in): Span = 1980 (77.95) ***Deflection*** ***% Span*** *Inward:* 0.2(0.008) 0.01 *Outward:* 0.7(0.028) 0.04	**PASS**
Forced Entry Resistance **9.3.5** *ASTM F 588*	No entry shall be gained during the following sequence of disassembly, load tests and hardware and sash manipulation tests: ***Disassembly T1:*** 10 minutes ***Manipulation T1:*** 10 minutes	No entry was gained following the specified sequence of testing. ***Test*** ***Results*** *Disassembly T1:* *OK* *Manipulation T1:* *OK*	**Grade 40**

TABLE (1.2): Test Results, Optional Performance Requirements **Class CW-PG65-FW**
Gateway Size: 1500 mm x 1500 mm (59.1 in x 59.1 in)
Test Size: 1981 mm x 1981 mm (77.99 in x 77.99 in)

Test Start Date: May 26, 2017 Test Finish Date: May 26, 2017

Test	Specifications	Test Results	Rating
Water Resistance **9.3.3** *ASTM E 547*	No leakage past innermost plane following four pressure cycles, each five minutes "ON" and one minute "OFF". Test Pressure, Pa (psf): 720 (15.04) *(Equivalent to wind speed of 77 mph)*	No leakage past innermost plane was observed. ***Test*** ***Max Pressure, Pa (psf)*** *4 cycles* *730 (15.24)*	**PASS**
Uniform Load Deflection **9.3.4.2** *ASTM E 330*	Maximum net deflection shall not be more than 1/175 of its span, or 11.3 mm (0.45 in) under the following design pressures, Pa (psf): Inward Pressure: 3120 (65.15) Outward Pressure: 3120 (65.15) *(Equivalent to wind speed of 160 mph)*	Measured net deflections, mm(in): Span = 1980 (77.95) *Inward:* 1.2 (0.047) *Outward:* 1.6 (0.063)	**PASS**
Uniform Load Structural **9.3.4.3** *ASTM E 330*	No glass breakage or permanent damage to window components, at Test Pressures, Pa (psf). Net Permanent Deflection to be less than 0.3% of span, or 5.9 mm (0.234 in). Inward Pressure: 4680 (97.72) Outward Pressure: 4680 (97.72) *(Equivalent to wind speed of 239 mph)*	Measured net permanent deflection of Jamb, mm(in): Span = 1980 (77.95) ***Deflection % Span*** *Inward:* 0.6(0.024) 0.03 *Outward:* 0.9(0.035) 0.05	**PASS**

* *Water Penetration Resistance Testing was carried out at pressure differentials equal to, and exceeding, the specified limit for U.S. applications.*

Revision Log:

Rev. No	Change	Date	Apprv. By
-	Original report issued	Jun. 9, 2017	EA

APPENDIX A *This appendix forms an integral part of Report No.:* L17-540-4878 *Verified by:* _____ *Date: June 9, 2017*

The provided description was prepared by the Client, and verified by CAN-BEST for general completeness. All measurements are reported in mm.

TEST SAMPLE DESCRIPTION Model: "TYPE A 500 R.S." FIXED WINDOW

Item	Type, Material, Part #	Qty*	Size (W x H x D)	Location, Fastening, Seals, Comments
Frame	Fixed, Aluminum		1981 x 1981 x 124 (78.0" x 78.0" x 4.9")	
Joinery				
Frame	Mechanical, Butt corners			Mechanically fastened with four # 8 x 1" screws per corner, sealed with butyl tape and flexible sealant prior to assembly
Installation	Wood buck			Five #10 x 2½" screws per side, frame perimeter sealed with polyurethane foam, and flexible sealant at exterior perimeter
Glazing				
Fixed panel	Double-pane, Annealed glass		Overall thickness: 25.4 mm (1.00")	Glass thickness: 6 (0.24")
Glazing Method	Laid-in glazed			
	Glazing stops, rigid PVC	1 row		Interior perimeter
	Glazing tape, Polyshim II	1 row		Exterior perimeter
	Heel bead, flexible sealant (silicone)	1 row		Interior perimeter
Reinforcing	None			
Thermal Break	Hollow Section, PVC	1 row	15.5 (0.6") wide gap	Frame perimeter, crimped in place
Drainage	Drain Holes	2	Diameter: 6 (0.24")	Sill, draining the glazing cavity

The above descriptions were provided by the manufacturer. Items and/or material properties were verified by CAN-BEST for general conformity only.

* Quantity is total unless otherwise specified

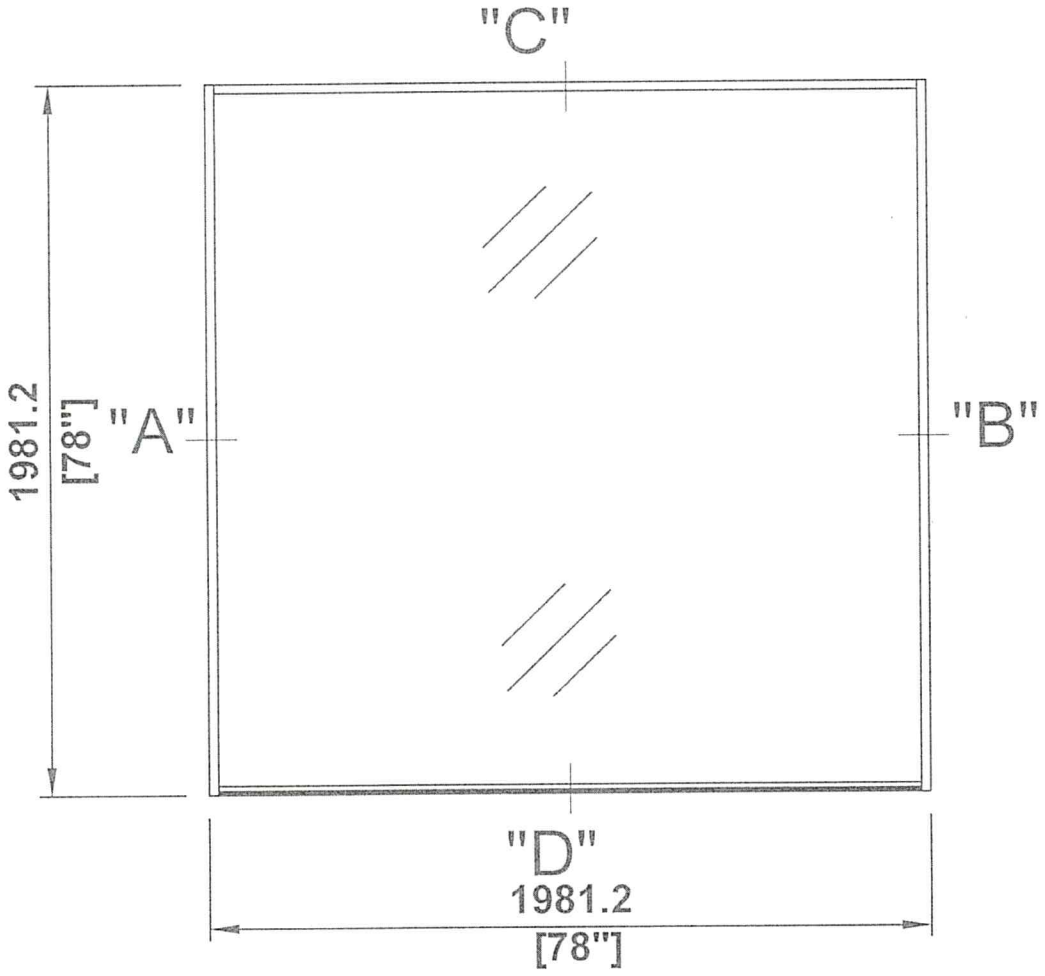
FALBO ALUMINUM SYSTEMS LTD.

Manufacturer of Storm Windows & Doors, Thermal Windows & Patio Doors,Vinyl & Aluminum

500v RS SERIES Thermally Broken Alum. Windows

NAF S-08,CAN / CSA / A440 - M00

C.G.S.B. 63-GP-2P



(Fixed)

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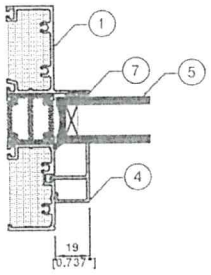
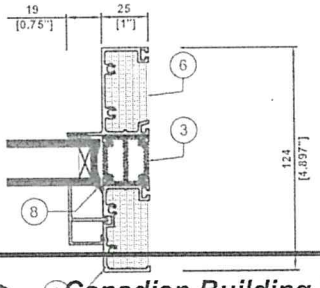


SECTION DETAIL

"A"



SECTION DETAIL

"B"

Horizontal cross section

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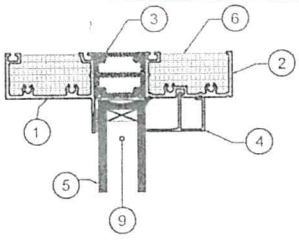
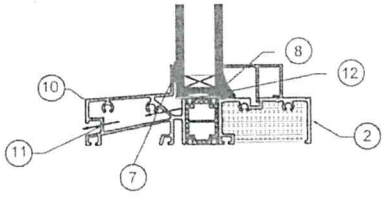


SECTION DETAIL

"C"

Glass-4mm+4mm
Spacer-warm edge



SECTION DETAIL

"D"

Vertical cross section

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List of Materials

ITEM	DESCRIPTION	DIE NUMBER
1	EXTERIOR MALE FRAME	AS-58174
2	INTERIOR MALE FRAME	AH-58172
3	PERIMETER THERMAL BREAK	V-706
4	SEALED UNIT PVC GLASS STOP	AS-25032
5	SEALED UNIT GLASS	
6	STYROFOAM INSULATION	
7	GLAZING TAPE	
8	INTERIOR PERIMETER SEALANT	
9	6mm DRAIN / WEEP HOLE	
10	EXTERIOR BASE DRAINAGE	AH-70354
11	6mm DRAIN/WEEP HOLE	
12	GLAZING BLOCK	
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