

TEST REPORT



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EVALUATION CENTER

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RENDERED TO

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PRODUCT EVALUATED: AGS-VUE3 – Thermally Broken Aluminum Folding
Door System with Eclipse Hardware Configuration 3L 1R
EVALUATION PROPERTY: Performance Testing

**Report of testing the AGS-VUE3 – Thermally Broken Aluminum
Folding Door System with Eclipse Hardware Configuration 3L 1R, in
general accordance with: AAMA/WDMA/CSA 101/I.S.2/A440-05,
“Standard/Specification for Window, Doors and Unit Skylights”
(AAMA/A440-05)**

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2 Introduction

As requested, Intertek Testing Services NA Ltd. (Intertek) has conducted a series of performance tests on an AGS-VUE3 3L 1R Aluminum Folding Wood Door System, submitted to our Intertek Coquitlam Laboratory. Testing was conducted between January 18 and March 10, 2006.

Testing was conducted in general accordance with AAMA/WDMA/CSA 101/I.S.2/A440-05, "Standard/Specification for Window, Doors and unit skylights" (AAMA/A440-05).

3 Product Description

Series	<ul style="list-style-type: none">• AGS-VUE3 3L 1R
Designation	<ul style="list-style-type: none">• Double-glazed four panel folding door
Frame	<ul style="list-style-type: none">• Head Frame: extruded aluminum thermally broken• Sill Frame: extruded aluminum thermally broken• Jambs: extruded aluminum thermally broken• Frame joints were butt joint sealed with silicone• Installation: the door system was secured to the test chamber through the jambs using one #10 x 64 mm (2-1/2") FH SS screws spaced at 457 mm (18"); head track was secured to the test chamber using #10 x 51 mm (2") PH SS screw spaced at 305 mm (12"); sill secured with #10 x 64 mm (2-1/2") FH SS screws spaced at 406mm (16").
Overall Size	<ul style="list-style-type: none">• Width: 4178 mm (164-1/2")• Height: 2604 mm (102-1/2")
Door Slabs	<ul style="list-style-type: none">• Sash stiles and rails: Extruded aluminium thermally broken• Corners: Mitred corner fastened with two #10 x 38 mm (1-1/2") SS screws and reinforced with an aluminum angle 38 mm x 38 mm x 3mm x 28 mm long (1-1/2" x1-1/2" x 1/8" x 1-1/8" long).
Sash Size	<ul style="list-style-type: none">• Width: 1016 mm (40")• Height: 2508 mm (98-3/4")
Locks and Hardware	<p>1st Folding Door:</p> <ul style="list-style-type: none">• Three folding door hinges were located between the 1st and 4th door stiles located at the top and bottom, 984 mm (38-3/4") from the top & bottom. Each hinge was secured to each door slab using five #10 x 19 mm (3/4") machine screws.• Head and sill pivot hinges were located at the head and sill of the jamb stile secured using four 5 mm diameter x 9 mm (0.19"

x 0.35") machine screws. Each hinge was secured to the door slab using five #10 x 19 mm (3/4") machine screws.

**Locks and Hardware
(continued)**

2nd Folding Door:

- Three Folding Door Hinges were located between the 2nd and 3rd door stile located at the top and bottom and 984 mm (38-3/4") from the bottom. Each hinge was secured to each door slab using five #10 x 19 mm (3/4") SS machine screws.
- Top and bottom hinges were incorporated with roller assemblies.
- Flush mount surface bolts were located at the top and bottom of the interior right stile and secured using five #8 x 25 mm (1") self-tapping SS screws at the bottom and seven at the top.

3rd Folding Door:

- Top and bottom hinges were incorporated with roller assemblies.
- Flush mount surface bolts were located at the top and bottom of the interior astragal stile and secured using five #8 x 25 mm (1") SS self-tapping screws at the bottom and seven at the top.

Active Door:

- Head and sill hinges located at the head and sill secured using four 5 mm diameter x 9 mm (0.19" x 0.35") machine screws. All hinges secured to the door slab using five #10 x 19 mm (3/4") machine screws.
- 5 point multi-point locking system was secured to the astragal stile with the lock handle located at 787 mm (31") from the bottom rail.
- Flush mount surface bolts were located at the top and bottom of the astragal stile and secured using six #10 x 19 mm (3/4") SS self-tapping screws at the bottom and at the top.

Weatherstrips

- The meeting perimeter of the mainframe was weather-stripped with a jacketed foam filled compression kerf inserted seal (KT430). Corners were butt jointed and sealed using silicone.
- The exterior edge of the head track was weather-sealed with a pile and fin type seal (KTG31405NK) inserted into the T-slot of the header.
- 1st Folding Door: interior and exterior edge of the 1st door meeting stile and the exterior edge of the jamb stile were weather-stripped with a jacketed foam filled compression kerf inserted seal (KT430).
- 2nd Folding Door: interior and exterior edge of the 2nd door meeting stiles were weather-stripped with a jacketed foam filled

compression kerf inserted seal (KT430).

- 3rd Folding Door: exterior face of astragal was weather stripped with single sided compression foam type weather-stripping.
- Active Door: both stiles (edges) were weather-stripped with a jacketed foam filled compression kerf inserted seal (KT430).
- At all hinge locations, profile cut Neoprene gaskets (adhesive backed) were applied to the perimeter of the hinge, and the joint between the gasket and stile weather-stripping was sealed with silicone.
- A modified sill weather bar with V type weather-strip was added to the total sill height of 38 mm (1-1/2") from the sill base.

Drainage

- 7.12 mm (0.24") x 25.4 (1") weep slots were punched into the front face of the aluminum sill and through to the intermediate trough at 305 mm (12") spacing.

Glazing Thickness

- Glazing Units: 5 mm clear tempered, 15 mm (5/8") aluminum spacer bar and a 5 mm tempered glass panel backed with polyisobutylene and silicone.
- Overall Thickness: 26 mm (1").

Glazing Method

- Laid-in exterior glazing: glazing panels were laid onto an EPDM rubber hollow gasket.
- Exterior Glazing Stop was wedged to exterior face of the door slab using 19 mm x 10 mm (3/4" x 3/8") bead and an EPDM hollow wedge-in gasket.
- Glazing unit support: two setting blocks were located at 76 mm (3") from the corners.

Drawings

- Set of drawings stamped "Intertek Testing Services" included in Appendix B of this report.

4 Test Program

Air Leakage Resistance Test

Air Leakage Testing (Infiltration) was performed in accordance with 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.”* The test was performed using the specified pressure differentials.

Water Penetration Test

A Water Penetration Resistance test was performed in accordance with ASTM E331-00 *“Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference.”*

A calibrated water spray assembly was used to deliver the water on the test sample. The test was performed using the specified pressure differential and a water spray rate of at least 204 L/m² per hour (5.0 U.S. gal/ft² per hour). The test period was 15 minutes during which the water spray and test pressure were continuously applied.

An additional water test was performed in accordance with ASTM E547-00 *“Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference”*. The Water Tightness test was performed using the specified pressure differential and a water spray rate of at least 204 L/m² per hour (5.0 U.S. gal/ft² per hour). Each cycle consisted of five minutes with the pressure applied and one minute with the pressure released, during which the water spray was continuously applied.

Uniform Load Deflection Test

A Uniform Load Deflection test was conducted in accordance with ASTM E-330-02 *“Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference,”* Procedure A. After a 10 second preload (50% of test load), followed by 1 minute with the pressure released, the Uniform Load Deflection test was conducted at a test pressure of 1915 Pa (40.0 psf) 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 door system that would cause any operational malfunction.

Uniform Load Structural Test

A Uniform Load Structural Test was conducted in accordance with ASTM E330-02 *“Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference,”* Procedure A. After a 1 minute 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 test pressure of 3112 Pa (60 psf) for a time of 10 seconds. The test was performed in both the positive and negative directions. After the test loads were released, the door was inspected for failure or permanent deformation of any part of the door system that would cause any operational malfunction.

DEVIATION FROM TEST STANDARD

There were no noted deviations from the specified standard test methods for the testing performed under this project.

5 Test Apparatus

Test	Application	Equipment	Intertek ID#
Air Leakage Resistance	To develop the test pressures	Air blower	--
	To measure the volume of air passing through the test sample	Meriam Instrument Co. laminar flow element, Model No. 50MW20-2F, Serial No. 748930-H1 and a Meriam Instrument Co. 8" H ₂ O inclined manometer, Model No. 40HEX35MW, Serial No. 748930-H2	P52611
	To measure the chamber pressure	Airflow Developments Ltd. 0-250 Pa manometer	P52603
	To measure the laminar flow element inlet pressure	Airflow Developments Ltd. 0-3" H ₂ O manometer	P52605
Water Penetration Resistance	To develop the test pressures	Air blower	--
	To measure the pressures	Airflow Developments Ltd. 0-3" H ₂ O manometer	P52605
	To deliver the water on the test sample	Water spray assembly	ITS1 & White Wall
Uniform Load Deflection and Structural	To develop the test pressures	Air blower	--
	To measure the pressures	Dwyer 0-36" H ₂ O manometer	D2697
	Deflections – top of latch stile, active door	Starrett 2" digital deflection gauge	1015
	Deflections – mid-span of latch stile, active door	Starrett 2" digital deflection gauge	1013
	Deflections – bottom of latch stile, active door	Starrett 2" digital deflection gauge	1014
	Deflections – top of hinge stile, middle doors	Starrett 2" digital deflection gauge	D2673
	Deflections – mid-span of hinge stile, middle doors	Starrett 2" digital deflection gauge	D2699
	Deflections – bottom of hinge stile, middle doors	Starrett 2" digital deflection gauge	D1274

6 Test Results

Air Leakage Resistance Test

Air Infiltration

An air infiltration test was performed using a test pressure of 75 Pa (1.57 psf). Based on a corrected infiltration rate of 14.36 m³/hr (8.46 cfm) and an overall area of 10.54 m² (113.46 ft²), the air infiltration rate was calculated to be 0.70 L/s/m² (0.12 cfm/ft²).

The measured leakage was less than the allowable air leakage for SHD-C30 for AAMA/CAS A440-05 of 1.5 L/s-m² (0.3 cfm/ft²).

An additional air infiltration test was performed using a test pressure of 300 Pa (6.24 psf). Based on a corrected infiltration rate of 10.92 m³/hr (18.56 cfm) and an overall area of 10.54 m² (113.46 ft²), the air infiltration rate was calculated to be 0.90 L/s/m² (0.16 cfm/ft²).

Water Penetration Resistance Test

During the 15 minute test period at a pressure difference of 400 Pa (8.82 psf), there was no water leakage observed.

A subsequent test was performed in accordance with ASTM E 547-00. During the 24 minute test period at a pressure difference of 400 Pa (8.82 psf), there was no water leakage observed.

Uniform Load Deflection Test

The test was performed using a Design Pressure of ± 1.92 kPa (40 psf). Deflection measurements were taken at the mid spans and end reactions of the active panel, latch stile, and the centre panel, hinge stile. Both spans were 2440 mm (96.06 in.) Deflections are shown in the following table:

Stile	Loading Direction	Test Pressure		Actual Deflection		Residual Deflection	
		(Pa)	(psf)	(mm)	(in.)	(mm)	(in.)
Active panel – latch stile	Positive	1915	40.0	9.776	0.385	0.260	0.010
	Negative	1915	40.0	10.302	0.406	0.018	0.001
Centre panel – hinge stile	Positive	1915	40.0	13.320	0.524	-0.066	-0.003
	Negative	1915	40.0	14.130	0.556	0.172	0.007

After the test loads were released, the door was inspected and there was found to be no failure or permanent deformation of any part of the door system that would cause any operational malfunction.

Uniform Load Structural Test (Blow Out)

Test pressure: 2.88 kPa (60 psf)

After the test loads were released, the door was inspected and there was found to be no failure or permanent deformation of any part of the door system that would cause any operational malfunction.

TEST HISTORY

See Appendix A for test history and modifications.

7 Conclusion

The AGS-VUE3 Thermally Broken Aluminum Folding Door System, with Eclipse Hardware Configuration 3L 1R, described herein, was tested for compliance to, and met, the Air, Water & Structural performance requirements only, for a Performance Designation of **SP-C30**. In addition, the door system was tested for, and met, the Water Penetration Resistance requirements for the Optional Water Performance rating of SP-C55, and the Uniform Load Structural requirements for the Optional Structural Performance rating of SP-C40.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK TESTING SERVICES NA LTD.

Tested and
Reported by:



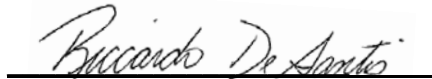
David Park for: Graeme Huckell
Technician – Fenestration Products

Revision by:



David Park
Technician – Building Products

Reviewed by:



Riccardo DeSantis
Manager – Building Products Canada

APPENDIX A

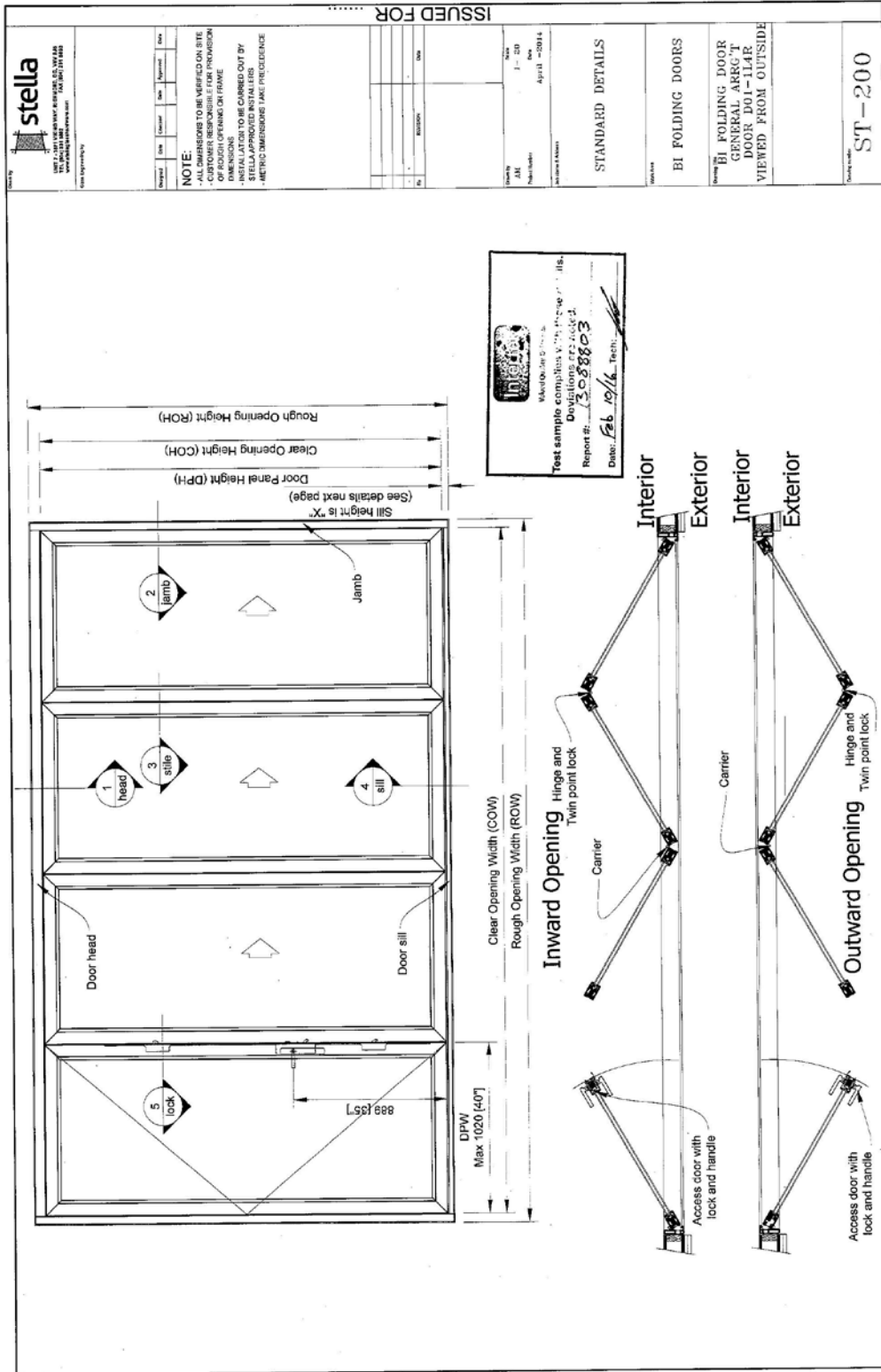
Testing History – 1 page

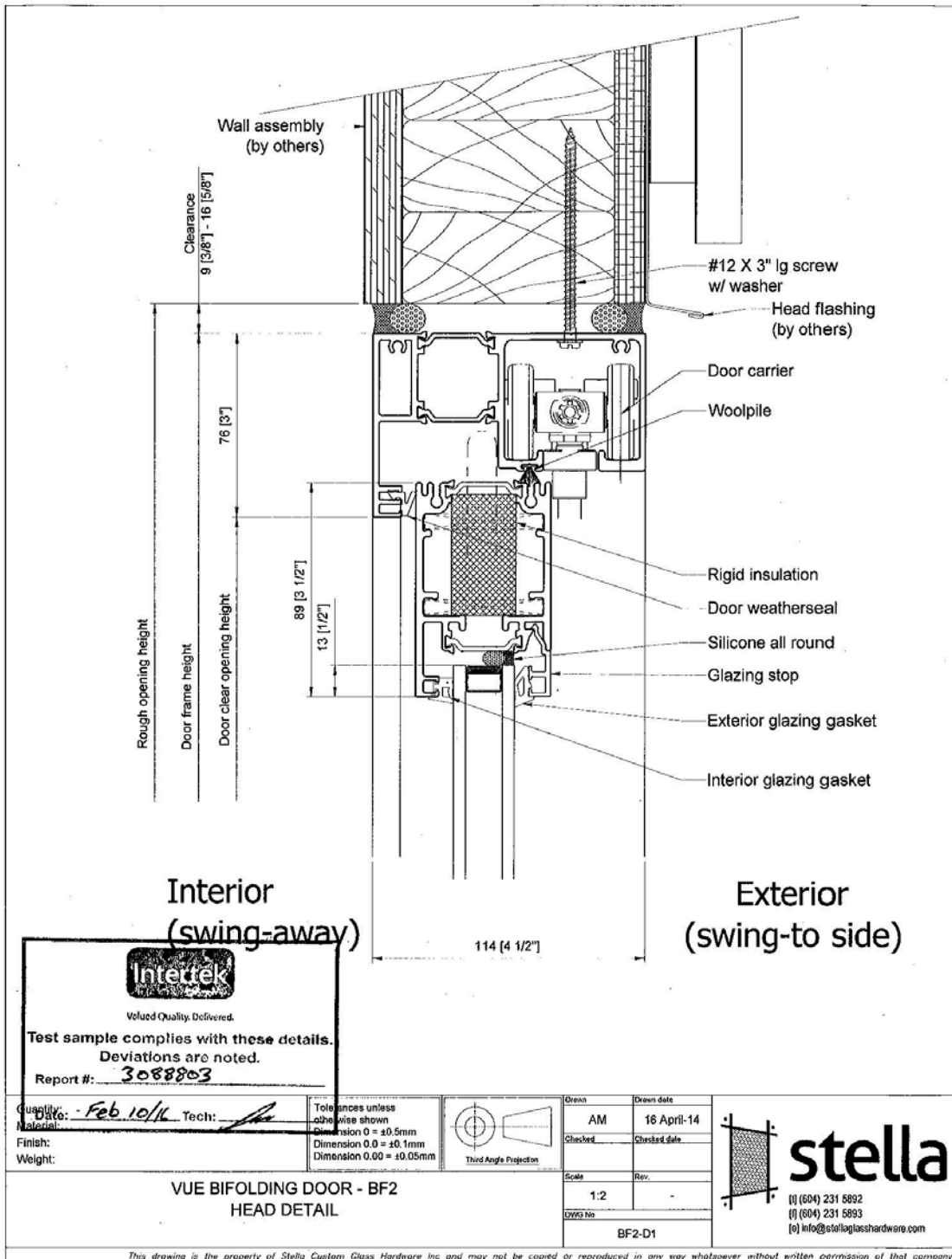
TESTING HISTORY

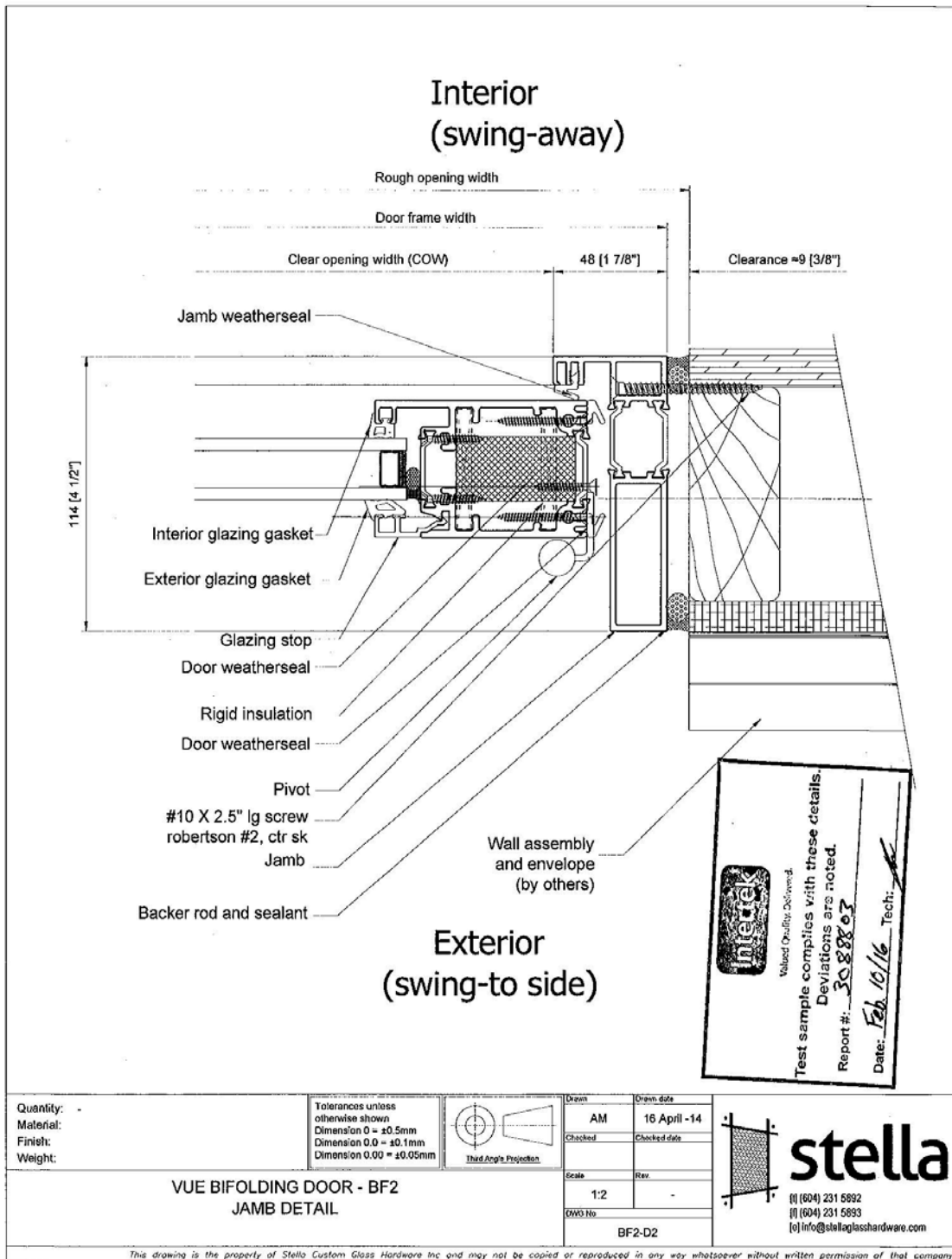
Date	Test	Event	Modification
Feb. 6 to March 6, 2006	Air Infiltration and Water Tightness Testing	Air and Water test result unsatisfactory.	Weather Stripping materials and sealing changes as described in the "Product Description" section of this report.
March 6,2006	Structural Test (1.5 x Design).	Flush bolt screws pulled out of door slab.	Original screws were replaced with longer # 8 x 51 mm (2") SS screws. System was retested and passed the test.

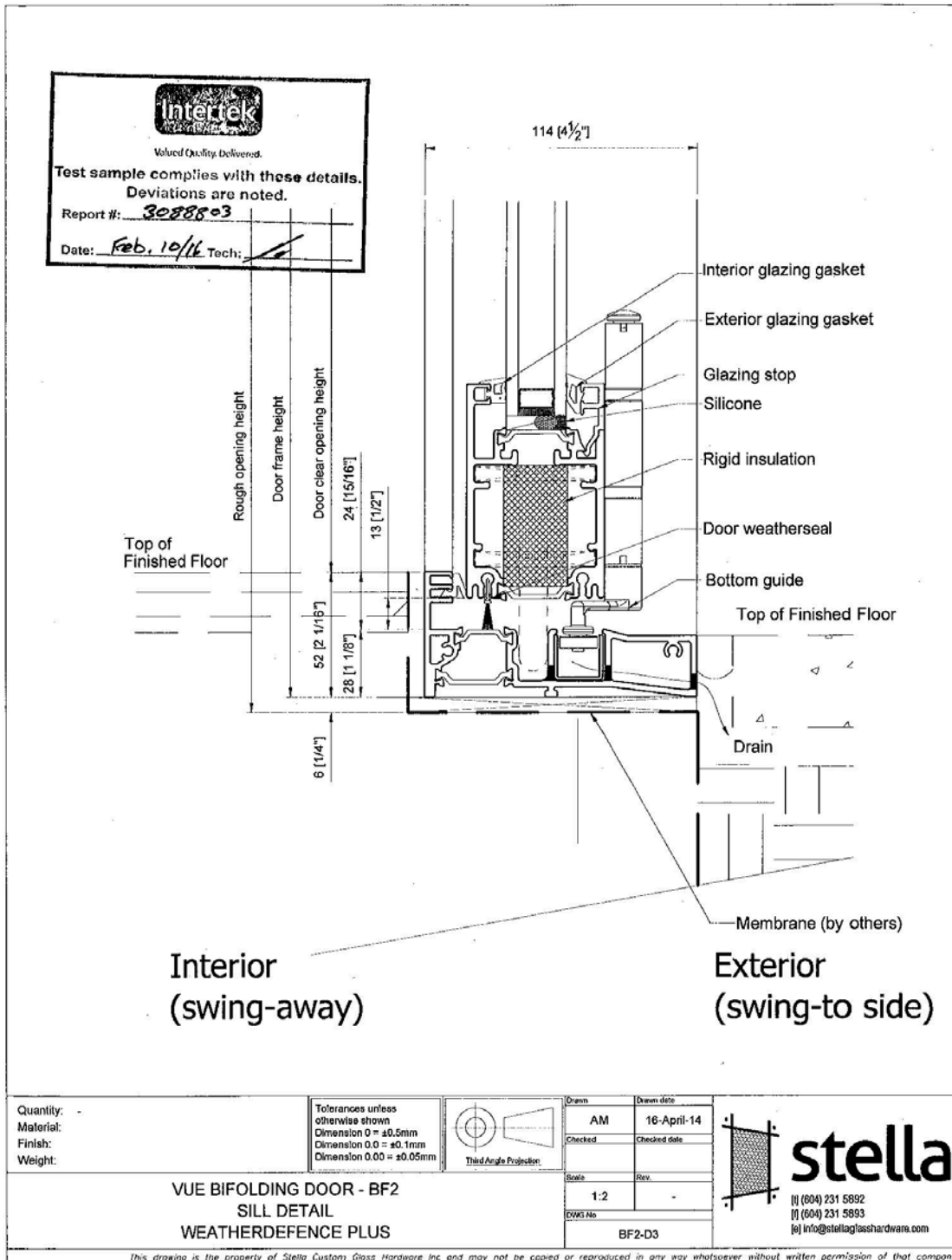
APPENDIX B

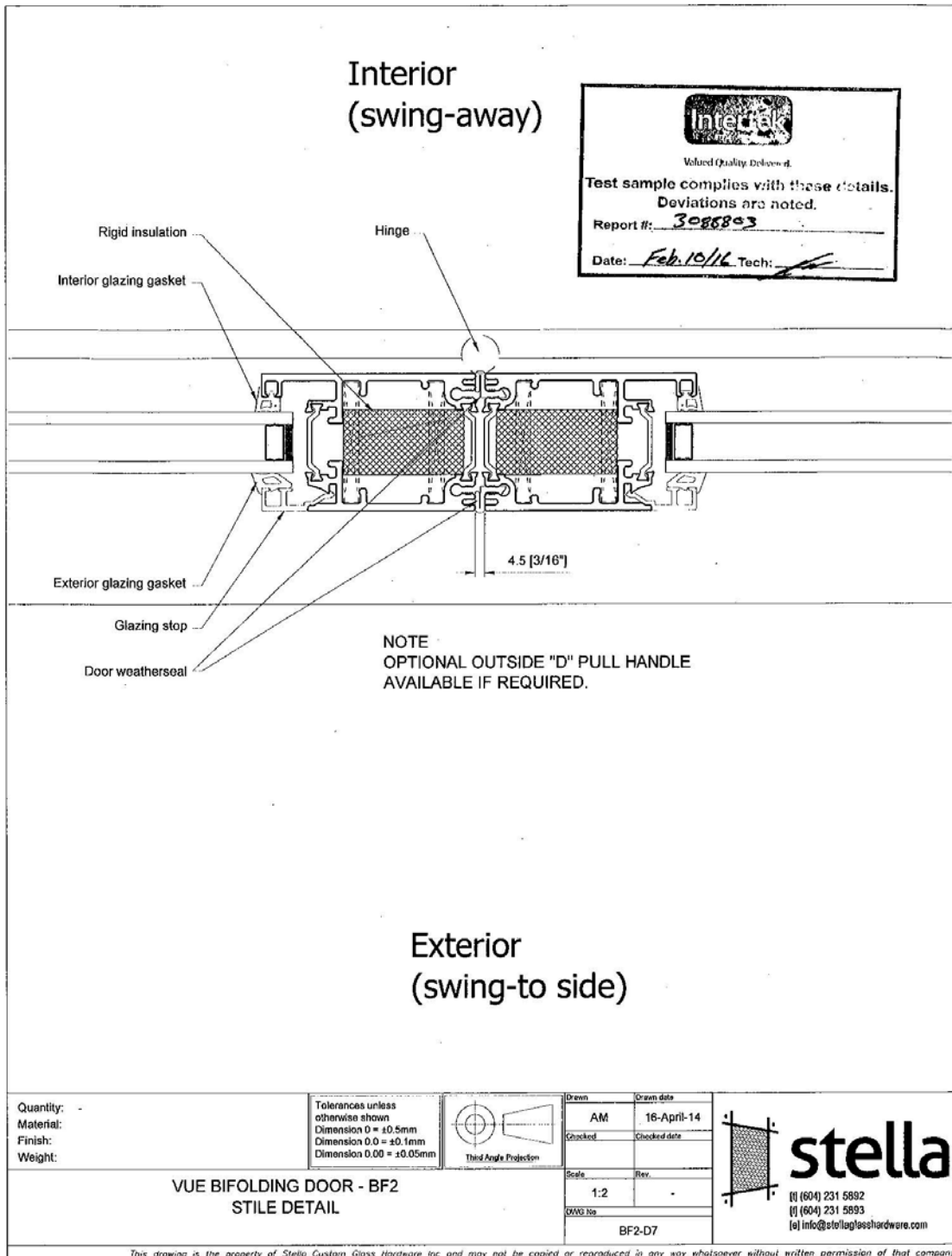
Drawings – 6 Pages

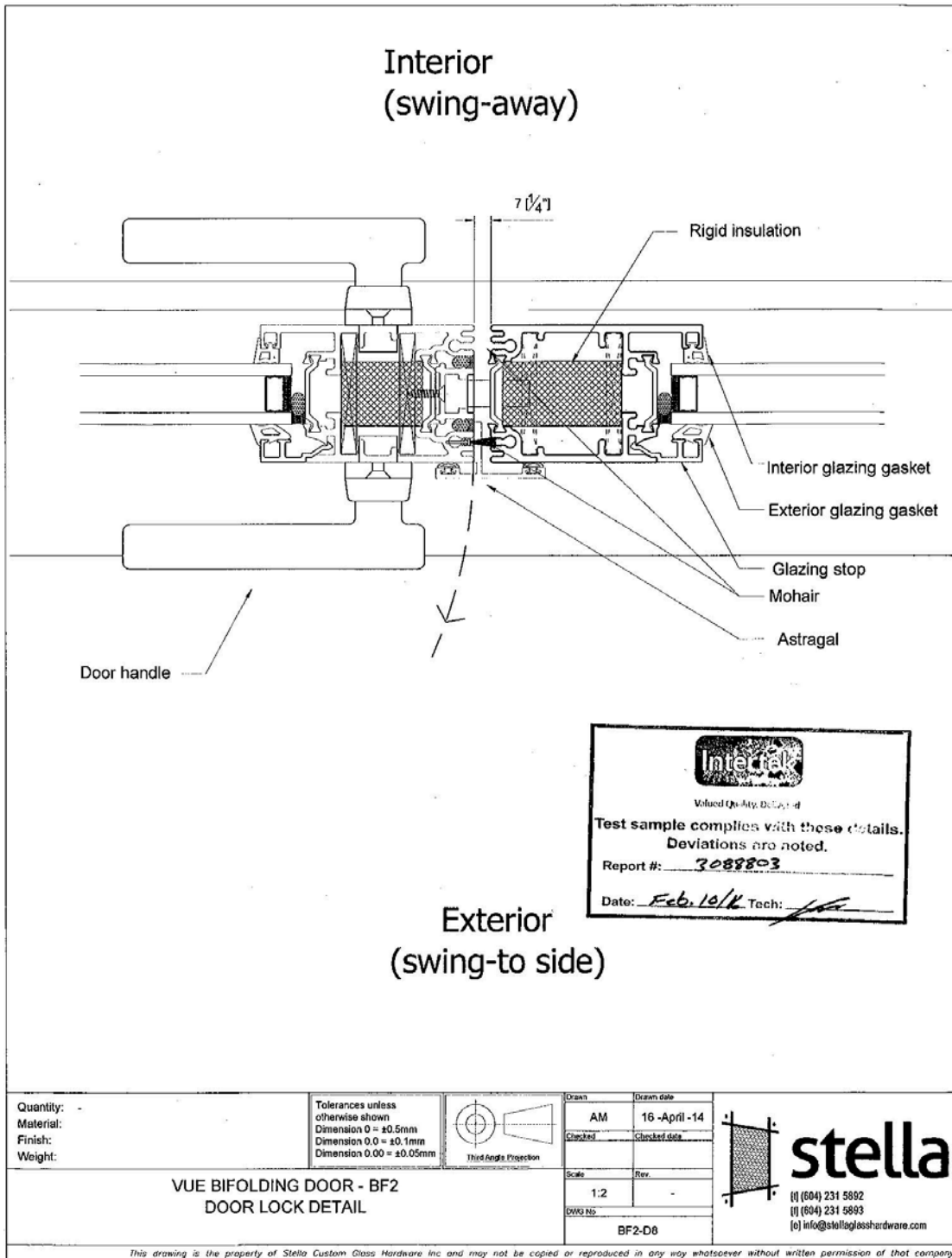












APPENDIX C

Photograph – 1 page



Photograph No. 1 – Exterior View

REVISION SUMMARY

DATE	PAGE	SUMMARY
Jan. 22/07	1, 3, 11	Changed product series ID from Eclipse E3 TBAS to AGS-VUE3 as per email dated Jan. 17/07
June 28, 2011	All	Reissued report to Stella Custom Glass Hardware Inc. as per authorization received May 10, 2011 from The Bowra Group
Feb 10, 2016	11	Product Designation corrected from "SHD" to "SP"
		Added in signature line for "Revision By:"
		Reviewer changed to Riccardo DeSantis
	Appendix B	Updated drawing package