Fenestration Structural Test Report
Rendered To
Arcadia Architectural Products, Inc.
60 Bonner Street
Stamford, CT 06902

Series/Model
Ultimate 5000 Patio Door (XO)

Description: The products tested were aluminum sliding glass doors with one operable panel. The door panels were glazed with IG units with a nominal thickness of one inch and constructed using an aluminum box spacer and two lights of 3/4 inch-tempered glass. The frame size was 118-1/8 inches wide by 95-1/2 inches high by 4-3/4 inches deep. Unit# 1 used a 2-3/8 inch high sill and was mounted to the buck using eighteen #10 screws. Unit# 2 used a 3 inch high sill and was mounted to the buck using twenty-four #12 screws.

Test Specification: AAMA/NWWDA 101/1.8.2 – 97

Summary of Results

<table>
<thead>
<tr>
<th></th>
<th>Unit# 1</th>
<th>Unit# 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Overall Design Pressure (psf)</td>
<td>40</td>
<td>60</td>
</tr>
<tr>
<td>Air Leakage Rate Achieved (scfm/ft²)</td>
<td>0.08</td>
<td>0.08</td>
</tr>
<tr>
<td>Maximum Water Pressure Achieved (psf)</td>
<td>8.25</td>
<td>12.0</td>
</tr>
<tr>
<td>Maximum Structural Pressure Achieved (psf)</td>
<td>60</td>
<td>90</td>
</tr>
<tr>
<td>Forced Entry Rating Achieved Grade</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Overall Product Rating SGD - HC40 - 118 x 96 - Unit 1
Overall Product Rating SGD - HC60 - 118 x 96 - Unit 2
Specifications: The test specimen was evaluated in accordance with AAMA/NWWDA 101/L.S.2-97. “Voluntary Specification for Aluminum, Vinyl and Wood Windows and Glass Doors,” sections 1, 2 and 4 only. All performance specifications in this standard shall be met for full compliance to the standard and for product certification, labeling or represented as conforming to this standard.

Referenced Test Reports: ETC-01-166-11339.0 & 01-166-11514.0
Note: The test data in any section below with an “RTR” comment have not been obtained from this specimen but from the Referenced Test Report with a specimen of the same or larger size and identical construction.

Design Pressure (DP) – The product tested herein has been first evaluated to the Gateway pressure in the referenced specification for the performance class rating achieved.

### Gateway Performance Tests

<table>
<thead>
<tr>
<th>Specification</th>
<th>Title of Test</th>
<th>Results</th>
<th>Allowed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Unit# 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.1.2</td>
<td><em>Air Infiltration – ASTM E283</em></td>
<td>Test Pressure - 6.24 psf</td>
<td>0.08 scfm/ft²</td>
</tr>
<tr>
<td>2.1.3</td>
<td><em>Water Resistance – ASTM E547</em></td>
<td>2 3/8 inch Sill</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>5 gal/hr-ft² – 4 Test cycles – 24 Minutes</td>
<td>Test Pressure - 6.0 psf (15% x DP)</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Design Pressure - 40.0 psf</td>
<td>With Screen</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Without Screen</td>
<td>Without Screen</td>
<td>Pass</td>
</tr>
<tr>
<td>2.1.3</td>
<td><em>Water Resistance – ASTM E331</em></td>
<td>2 3/8 inch Sill</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>5 gal/hr-ft² – 15 Minutes</td>
<td>Design Pressure - 40.0 psf</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Test Pressure - 6.0 psf (15% x DP)</td>
<td>With Screen</td>
<td>Pass</td>
</tr>
<tr>
<td></td>
<td>Without Screen</td>
<td>Without Screen</td>
<td>Pass</td>
</tr>
<tr>
<td>2.1.4</td>
<td><em>Uniform Load Deflection – ASTM E.330</em></td>
<td>Actual</td>
<td>L/175</td>
</tr>
<tr>
<td></td>
<td>Design Pressure - 40.0 psf</td>
<td>Test Pressure</td>
<td>0.371 in.</td>
</tr>
<tr>
<td></td>
<td>Positive Load - 40.0 psf (100% x DP)</td>
<td>Negative Load - 40.0 psf (100% x DP)</td>
<td>0.208 in.</td>
</tr>
<tr>
<td>2.1.4</td>
<td><em>Uniform Structural Load – ASTM E.330</em></td>
<td>Actual</td>
<td>0.4% Set</td>
</tr>
<tr>
<td></td>
<td>Design Pressure - 40.0 psf</td>
<td>Test Pressure</td>
<td>0.006 in.</td>
</tr>
<tr>
<td></td>
<td>Positive Load - 60.0 psf (150% x DP)</td>
<td>Negative Load - 60.0 psf (150% x DP)</td>
<td>0.009 in.</td>
</tr>
</tbody>
</table>

Note: DP 40 rating achieved with #10 x 3 inch long stainless steel screws into buck at head and jambs. L/175 test results not required for HC rating.

**Accreditation/Recognition’s**
*Laboratories and Offices in New York and Ohio*
# Gateway Performance Tests (con’t)

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<thead>
<tr>
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</table>
| 2.1.8         | **Forced Entry Resistance - ASTM F 642**  
Grade Level - 10 |         |         |
|               | Lock Manipulation | Pass    | No Entry |
|               | Tests - A1, A2, A3, A4, A5, A6 | Pass    | No Entry |
|               | Lock Manipulation | Pass    | No Entry |
| 2.2.19.5.1    | **Operating Force – ASTM** |         |         |
|               | Right Panel – Open / Close | 9 / 9 lbf | 25 lbf  |
|               | Right Panel – Breakaway     | 34 lbf   | 40 lbf   |
| 2.2.19.5.2    | **Dealing – ASTM E 987** |         |         |
|               | Right Panel – Rails – 50 lbf | 5% (0.04 in.) | <100%  |
|               | Right Panel – Rails – 50 lbf | <1% (0.00 in.) | <100%  |
|               | Right Panel – Stiles – 70 lbf | 8% (0.06 in.) | <100%  |
|               | Right Panel – Stiles – 70 lbf | <1% (0.00 in.) | <100%  |
|               | Left Panel – Rails – 50 lbf  | 6% (0.05 in.) | <100%  |
|               | Left Panel – Rails – 50 lbf  | 3% (0.03 in.) | <100%  |
|               | Left Panel – Stiles – 70 lbf  | 5% (0.04 in.) | <100%  |
|               | Left Panel – Stiles – 70 lbf  | 2% (0.01 in.) | <100%  |
# Optional Performance Tests

The manufacturer specified herein has successfully achieved all the required criteria in section 1 of the referenced specification for the size of the achieved Performance Rating and has further successfully tested the product to higher performance levels as indicated below.

**Design Pressure (DP)** — The product tested herein has been additionally evaluated to the Design Pressure referenced below.

<table>
<thead>
<tr>
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<tbody>
<tr>
<td><strong>Unit# 1</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td><em>Water Resistance – ASTM E547</em> 5 gal/hr-ft² — 4 Test cycles — 24 Minutes <em>Design Pressure — 55.0 psf</em> <em>Test Pressure — 8.25 psf (15% x DP)</em> With Screen</td>
<td>Pass</td>
<td>No Leakage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>2 3/8 inch Sill</td>
<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Water Resistance – ASTM E331</em> 5 gal/hr-ft² — 15 Minutes <em>Design Pressure — 55.0 psf</em> <em>Test Pressure — 8.25 psf (15% x DP)</em> With Screen</td>
<td>Pass</td>
<td>No Leakage</td>
</tr>
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<td></td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Unit# 2</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4.3</td>
<td><em>Water Resistance – ASTM E331</em> 5 gal/hr-ft² — 15 Minutes <em>Design Pressure – 80.0 psf</em> <em>Test Pressure – 12.0 psf (15% x DP)</em> With Screen</td>
<td>Pass</td>
<td>No Leakage</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>RTR11339</td>
<td></td>
<td>3 inch Sill</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><em>Water Resistance – ASTM E547</em> 5 gal/hr-ft² — 4 Test cycles — 24 Minutes <em>Design Pressure – 80.0 psf</em> <em>Test Pressure – 12.0 psf (15% x DP)</em> With Screen</td>
<td>Pass</td>
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<td></td>
<td></td>
<td></td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td>3 inch Sill</td>
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</tr>
</tbody>
</table>

Note: Water test conducted on a 90 in.W. x 84 in. H. door (ETC Report 01-166-11339.0)
Optional Performance Tests (Con't.)

Unit # 2 Tests con't

4.4 Uniform Load Deflection - ASTM E 330
   Design Pressure - 55.0 psf
   Test Pressure
   Positive Load - 55.0 psf (100% x DP) 0.518 in. 0.535 in.
   Negative Load - 55.0 psf (100% x DP) 0.335 in. 0.535 in.

4.4 Uniform Structural Load - ASTM E 330
   Design Pressure - 60.0 psf
   Test Pressure
   Positive Load - 90.0 psf (150% x DP) 0.008 in. 0.374 in.
   Negative Load - 90.0 psf (150% x DP) 0.009 in. 0.374 in.

Note: DP 60 rating achieved by replacing the #10 x 3 inch long stainless steel screws to mount the head and jambs to the buck with #12 x 3 inch long steel screws to the jambs only and #12 x 2-1/2 in. at the head, and then adding 6 - #12 x 2-1/2 inch long steel screws to the sill.

L/175 test results not required for HC rating.

Optional 4 inch Sill

4.3 Water Resistance – ASTM E347
   5 gal/hr-ft² – 4 Test cycles – 24 Minutes
   Design Pressure - 100.0 psf
   Test Pressure - 15.0 psf (15% x DP)
   With Screen Pass No Leakage
   Without Screen Pass No Leakage

4.3 Water Resistance – ASTM E331
   5 gal/hr-ft² – 15 Minutes
   Design Pressure - 100.0 psf
   Test Pressure - 15.0 psf (15% x DP)
   With Screen Pass No Leakage
   Without Screen Pass No Leakage

Note: Water test conducted on a 144 in. W. x 100-1/2 in. H. door for the 4 inch sill. (ETC Report 02-166-11514.0)
Product Description of Test Specimen

**Glazing:**

- Overall IG Thickness: One inch nominal (0.960 in)
- Thickness of Glass(s): 0.222 / 0.222 in. - Tempered
- Number of Lights: Two
- Sealant Material(s): PIB
- Spacer Material: Aluminum square profile — (0.490 in. W. x 0.350 in. H.)

**Frame:**

- Width, Height, Depth: 118-1/8 in. W. x 95-1/2 in. H. x 4-3/4 in. D.
- Material: Thermally Broken Aluminum profile
- Corner Construction: Coped
- Corner Fastening: Stainless Steel screws - 2 - #8 x 3/4 L. per corner
- Corner Sealing: Silicone
- Sill Height: 2 3/8 inch high interior sill leg
- Unit #1
- Unit #2: 3 inch high interior sill leg – non thermally broken

**Active Panel:**

- Width, Height, Depth: 60 1/8 in. W. x 93 7/8 in. H. x 4 3/16 in. D. (high load interlocker only), all other members 1 3/4 in. D.
- Material: Thermally Broken Aluminum profile
- Corner Construction: Coped
- Corner Fastening: Stainless Steel screws
  - Top left — 1 PFH #8 x 2 in. L.
  - Bottom left — 2 PFH #8 x 2 in. L. & 1-1/4 -20 x 2-1/2 in. Flat Head screw
  - Top right — 1 PPH #8 x 1-1/4 in. L.
  - Bottom right — 1 PPH #8 x 1-1/4 in. L. & 1 PFH #8 x 2-1/2 in. L.
  - 1-1/4 -20 x 1-1/2 Truss Head screw
- Corner Sealing: None
- Method of Glazing: Boot Glazed - PVC
Measuring Up To Your Standards, And More

Product Description of Test Specimen (con't)

Fixed Panel:

- **Width, Height, Depth**: 58 5/8 in. W. x 93 5/8 in. H. x 1 1/2 in. D.
- **Material**: Thermally Broken Aluminum profile
- **Corner Construction**: Coped
- **Corner Fastening**: Stainless Steel screws
  - Top left - 1 PFH #8 x 2 in. L
  - Bottom left - 2 PFH #8 x 2 in. L (one screw engages clip)
  - Top right - 1 PPH #8 x 1-1/4in. L.
  - Bottom right -2 PPH #8 x 1-1/4 in. L.
- **Corner Sealing**: None
- **Method of Glazing**: Boot Glazed – PVC
- **Reinforcement**: Aluminum angle clip (0.590 in. x 0.510 in. x 1.010 in.) at bottom interlock rail secured to sill with one #8 x 7/8 in. L at bottom of rail.
- **Other Sealant**: Silicone bead along interior bottom rail / sill interface

Weather-stripping:

- **Frame**
  - Sill: 1 - Fin-pile - 0.270 in. W. x 0.210 in. H.
  - Head: 4 - Fin-pile - 3 at 0.270 in. W. x 0.210 in. H. and 1 at 0.187 in. W. x 0.250 in. H.
  - Jambs: 2 - Fin-pile - 0.270 in. W. x 0.210 in. H.

- **Active Panel**
  - Latch Stile: 2 - Fin-pile - 0.270 in. W. x 0.210 in. H.
  - Interlocker: 1 - Fin-pile - 0.270 in. W. x 0.150 in. H.
  - Top Rail: None
  - Bottom Rail: One PVC water flap - 0.165 in. x 0.610 in. H.

- **Inactive Panel**
  - Interlocker: 1 - Fin-pile - 0.270 in. W. x 0.210 in. H.
  - Fixed Stile: 2 - Fin-pile - 0.270 in. W. x 0.210 in. H.
  - Top Rail: None
  - Bottom Rail: Plastic insert - 1.270 in. W. x 0.565 in. H.
# Measuring Up To Your Standards, And More

## Product Description of Test Specimen (con't)

### Drainage:
- **Type**: Sloped Sill

### Hardware:
- **Rollers**: Two tandem roller assemblies – 0.32 in. W. x 1-1/2 in. dia.
- **Locks**: One mortise lock 48 1/2 in. from bottom rail
- **Handle**: Aluminum - 3/4 in. dia. - 8-3/4 in. L. x 1-3/4 in. D.

### Screen:
- **Width, Height, Depth**: 60 1/4 in. W. x 94 in. H. x 1.029 in. D.
- **Frame Material**: Extruded Aluminum
- **Cloth Material**: Fiberglass
- **Corner Construction**: Mitered
- **Corner Fastening**: Aluminum Corner Keys - 2.77 x 2.77 x 0.41 in
- **Weep**: None
- **Screen Spline**: 0.210 in. Dia.
Product Description of Test Specimen (con't)

Anchorage of Frame to Test Buck:

- Fastener Type: Screws
- Material: Steel
- Size:
  - Unit 1: 18 - #10 x 3 inch long - Stainless Steel
  - Unit 2: 24 - #12 x 3 inch long - Steel

Location:
- Unit 1: Jambs and Head - six per side, 16 - 18 inches on center
- Unit 2: Jambs, Head & Sill - six per side, 16 - 18 inches on center

Note - Alternate installations shall be approved by the manufacturer.

Test Buck:

- Mounting Gap: ½ in. at Head and 3/8 in. at Jambs
- Shims-Qty./Location: At fastener locations
- Stops-Mtl./Qty./Location: None
- Sealant: Silicone
- Buck Size: 2 x 10
- Material: Fir - # 2

Review of Bill of Materials – Reviewed as supplied

Review of Assembly and Detail Drawings – Reviewed as supplied

Components changed or altered during testing to achieve stated results – None

This report, in its original form contains product drawings.

Product Description Approval
Clients Representative Signature on File
Date: 12/19/01

Product Description Analysis
William Yanda
Laboratory Representative

Accreditation's/Recognition's
Laboratories and Offices in New York and Ohio
Conditions, Terms, and General Notes Regarding These Tests

The product tested Has Been compared to the detailed drawings, bill of materials and fabrication information supplied by the client so named herein. Our analysis, which includes dimensional and component description comparisons, indicate the tested product and engineering information supplied by the client Are Equivalent. The report and representative samples will be retained for four years from the date of initial test.

These test results were obtained by employing all requirements of the designated test methods with no deviations. The test results and specimen supplied for testing are in compliance with the referenced specifications.

The test results are specific to the product tested by this laboratory and of the sample supplied by the client named herein, and they relate to no other product either manufactured by the client, a Fabricator of the client or of installed field performance.

This report Does Not Constitute an AAMA or NWWDACertified Product under the certification programs of these organizations. The program administrator of these programs and organizations may only grant product certification.

ETC Laboratories makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of ETC Laboratories.

No conclusions of any kind regarding the adequacy of the glass in the test specimen may be drawn from the test. Procedure "A" in ASTM E330 was used for this test.

ETC Laboratories letters, reports, its name or insignia or mark are for the exclusive use of the client so named herein and any other use is strictly prohibited. The report, letters, and the name of ETC Laboratories, its seal, or mark shall not be used in any circumstance to the general public or in any advertising.

Limitation of Liability: Due diligence was used in rendering this professional opinion. By acceptance of this report, this client agrees to hold harmless and indemnify ETC Laboratories, its employees and offices and owners against all claims and demands of any kind whatsoever, which arise out of or in any manner connected with the performance of work referred to herein. ETC laboratories reserves the right to subcontract any and all work for its clients in order to fulfill its contractual obligations for testing to these standards.

For ETC Laboratories

[Signature]
William Yanda
Test Technician

[Signature]
Arthur Murray, Manager
Wind Engineering Lab

Accreditation's/Recognition's
Laboratories and Offices in New York and Ohio
Subject  Arcadia Test Reports for Series 500 SGW & Series 5000 SGD

To whom it may concern

This letter is to confirm that Arcadia's test reports that are typically submitted for projects when requested by our customers are the most current ones we have at the time.

Products are not typically re-tested on a periodic basis and are only re-tested when a major or substantial re-design is implemented for that particular product.

Please feel comfortable that the test reports submitted are true, accurate and reflective of the associated product they refer to.

Sincerely,

[Signature]
UPG Glass Specs

Customer: 
Job Name: 
Unit Make up: 1" INSULATED UNIT 
Outboard Lite: 1/4" Guardian SN68 
Airspace/ Gas: 1/2" Airspace 
Inboard Lite: 1/4" Clear 
(Annealed, Heat-Strengthened, or Tempered)

- Visible Light Transmittance: 68%
- Visible Reflectance Out: 11%
- Solar Transmittance: 33%
- Solar Reflectance Out: 33%
- U-V Light Transmittance: 30%
- Winter Nighttime U-Value: 0.29
- Summer Daytime U-Value: 0.28
- Shading Coefficient: 0.43
- SHGC: 0.38

UPG Insulated Glass Units are third party certified with the Insulated Glass Certification Council (IGCC) to level CBA in accordance with ASTM E 2190

UPG Tempered Glass is certified by the Safety Glazing Certification Council (SGCC) conforming to 16 CFR 1201 & ANSI Z97.1-2009 for safety glazing

Applicable Standards: ASTM C1036-06 Std. Primary Flat Glass, ASTM C1048-04 Std. Flat Glass, Heat Treated & Fully Tempered where applicable.

UPG believes this calculated performance data to be reasonably accurate, but it may not precisely agree with similar performance data calculated using the LBL Window 5.2 program. UPG’s published data is based on the LBL Window 5.2 program, and from performance calculators found on the glass manufacturers websites.

These calculated numbers are for reference only and may vary; UPG is not stating these numbers are 100% accurate for all glass types. United Plate Glass will not be held responsible any inconsistencies or discrepancies.

These numbers have been calculated as 1" overall units with 1/2" airspace. Actual performance data may vary with the use of a different airspace and gas. All information has been pulled from the appropriate supplier websites.