

**PERFORMANCE TESTS IN ACCORDANCE WITH  
AAMA/WDMA/CSA 101/I.S.2/A440-08**



**Report No.:**

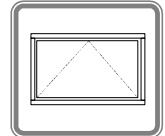
**AI-03820-C2 (Reissue-10)**

**Manufactured under licence by:**

**DOMINION DOORS AND WINDOWS LTD.  
130 PENNSYLVANIA AVE. UNIT 8  
CONCORD, ONTARIO  
L4K 4A8**

**Test Report Summary:**

**Product type:** PVC Awning Window  
**Product series/model:** GP327 Series Awning Window, 3-1/4" & 4-1/2" Frames  
**Primary product designator:** **Class LC-PG60-AP Size tested 1200 x 800 (47 x 32)**  
**Optional secondary designator:** Positive Design pressure (DP) = 2880 Pa (60.0 psf)  
Negative design pressure (DP) = -2880 Pa (-60.0 psf)  
Water penetration resistance test pressure = 730 Pa (15.0 psf)  
Canadian air infiltration / exfiltration level = A3 Level



**Test completion date:** 04/24/2012  
**Report date:** 12/17/2012  
**Reissue date:** 08/22/2013  
**Number of pages:** 8

**CAN/CSA A440-00 ratings:** **A3 / B7 / C4 / F20 / S1**

**Note:** Reference must be made to Air-Ins Inc. complete report for test specimen description and detailed test results.

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## TABLE OF CONTENTS

1.0	INTRODUCTION.....	1
2.0	DESCRIPTION OF THE SPECIMEN TESTED.....	1
3.0	ALTERATION(S) .....	5
4.0	TEST BENCH INFORMATION .....	5
5.0	RESULTS OF PERFORMANCE TESTS.....	6
5.1	TEST SPECIMEN PRIMARY TESTING.....	6
5.2	TEST SPECIMEN AUXILIARY TESTING.....	7
6.0	CONCLUSION .....	8
7.0	REVISION LOG .....	8



## PERFORMANCE TESTS IN ACCORDANCE WITH AAMA/WDMA/CSA 101/I.S.2/A440-08

### 1.0 INTRODUCTION

Air-Ins Inc. laboratory was retained by "**Acrylon Plastics**" to test a window according to the performance levels in the AAMA/WDMA/CSA 101/I.S.2/A440-08 Standard. The original report issued to "**Acrylon Plastics**" is hereby reissued to "**Dominion Doors and Windows Ltd**" for their use as an under licence product manufacturer. The sample components and manufacturing are documented in section 2.0.

Note concerning the use of units of measurement in this report:

According to the AAMA/WDMA/CSA 101/I.S.2/A440-08 Standard, the use of SI (metric) units is the standard, while IP (Imperial) values given in parentheses are for reference purposes only, and are inexact rounded values. Section 5.0 contains testing results converted to IP units for the sake of convenience only. The only exception to using SI values is in the Performance Grade (PG) portion of the product designation.

Note concerning drawings:

The drawings reviewed for the production of this report are stamped and are on file at Air-Ins Inc. The availability of individual drawings will be at the discretion of the client.

### 2.0 DESCRIPTION OF THE SPECIMEN TESTED

**Type:** Awning, type A of AAMA/WDMA/CSA 101/I.S. 2/A440-08.

- Number of sashes: (1) outward-opening sash with rotary operator

**Model:** GP327 Series PVC Awning Window, 3-1/4" & 4-1/2" Frames

- Assembly drawings:**
- GP327 (3-1/4") - Awning Window
  - GP327 Auvent PVC 1 section- dimension 1200x800 (parts list)

Performance Evaluation: GP327 Series PVC Awning Window, 3-1/4" & 4-1/2" Frames

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**Drawings reviewed:** - Part nos.: GP327NF, GP382, GP329, GP345 and GP346.

**Date of CSA audit:** 11/03/2011

**Date(s) of sample reception:** 11/15/2011 and 04/04/2012

**Date(s) of testing:** 11/22/2011, 11/23/2011, 01/26/2012, 04/13/2012 and 04/24/2012

**For items marked with \*, please refer to Section 3.0, for detailed alterations**

**Test specimen installation (test buck):**

- Material: 2" x 6" Spruce
- Rough opening clearances: 2 mm (0.08")
- Fastening: #8 x2" screws; (3) per head and sill and (2) per jamb, through wood test buck frame into PVC.
- Sealing detail: Sealant between test buck and specimen on exterior side only.

**Frame:**

- Material: Extruded PVC
- Joinery type: Thermally welded mitre joints
- Perimeter: Part no. GP327NF
- Reinforcement: None
- Weatherstripping: None
- Sealant: Sealant under the operator.
- Drainage: None
- Overall dimensions: 1200 mm (47.24") W x 800 mm (31.50") H

**Sash:**

- Material: Extruded PVC
- Joinery type: Thermally welded mitre joints
- Perimeter: Part nos. GP382
- Glazing stops: Part no. GP329

**Performance Evaluation: GP327 Series PVC Awning Window, 3-1/4" & 4-1/2" Frames**

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- Reinforcement: None
- Weatherstripping: Exterior: coextruded fin; not welded at corners, cut (notched 10 mm (0.39") each) at lower rail. Intermediate: compression bulb; co-extruded; welded corners. Interior: compression bulb; co-extruded, welded corners.
- Sealant\*: Sealant 51 mm x 51 mm (2" x 2") at corners of exterior glazing gasket and 152 mm (6") at center of upper rail exterior glazing gasket, before laying glass unit. Sealant between glazing and lower rail, full width and up 152 mm (6") each stile. Sealant at each corner before horizontal glazing stops installation. Sealant each corner on top of horizontal glazing stops before installing vertical glazing stops.
- Drainage: (2) rectangular openings 19 mm x 4.5 mm (0.75" x 0.18") under sealed unit and (2) rectangular openings 16 mm x 3.1 mm (0.63" x 0.12") under the sash in the PVC.
- Overall dimensions: 1159 mm (45.63") W x 760 mm (29.92") H

**Hardware:**

- Single point locks: (2) 6-C7011-00-0-27 (Ferco)
- Keepers: (2) 6-C2440-06-0-1(Ferco); (3) #10 x 1/2" pan head screws
- Hinges: (2) 22"; 13.16 (Truth); (6) #7-10 x 1/2" undercut screws (frame) and (4) #7-10 x 5/8" undercut screws (sash)
- Snubbers\*: Frame: (1) GP346 (Acrylon), 240 mm (9.45") Length with (4) staples. Sash : (1) GP345 (Acrylon), 200 mm (7.87"); (3) #8 x 3/8" pan head screws.
- Rotary operator: (1) Encore 51.10 (Truth); (6) #7-10 x 1/2" undercut

**Performance Evaluation: GP327 Series PVC Awning Window, 3-1/4" & 4-1/2" Frames**

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- Operator track: screws.  
(1) 11577 (Truth); (4) #7-10 x 1/2" undercut screws
- Handle/ cover pack: (1) Tango 12614 (Truth)

**Glazing:** (Legend: **C**= Clear, **Tt**= Tinted, **LE**= Low-E, **S**= Surface #, **A**= Annealed, **T**= Tempered)

- Type: Double glazed sealed unit
- Total thickness: 21.2 mm (0.83")
- Glass thickness: Ext: 2.9 mm (0.11")/ Int: 2.9 mm (0.11")
- Air space gap width: 14.6 mm (0.57")
- Type of glass: Ext: C-A / Int: C-A
- Type of spacer: "Ultimate"
- Type of sealant: Dual-sealed
- Type of filling gas: Argon
- Glass retention: Glazing stops
- Glazing seals: Exterior face (Dry sealed): (1) coextruded fin and (1) nub. Interior face (Dry sealed): (2) coextruded fins.
- Grid description: None
- Setting blocks: 32 mm x 22 mm x 4.6 mm (1.26" x 0.87" x 0.18"); (3) at lower rail, (2) per stile and (2) at top rail.
- Daylight opening: 1033 mm (40.67") W x 634 mm (24.96") H

**Screen:**

- Frame material: Rolled aluminum, part no. CAD 981P (MSA) with corner brackets part no. PL981P (MSA)
- Mesh material: Fiberglass
- Anchoring method: Integrated rubber tabs on corner brackets
- Auxiliary parts: (2) nylon handles
- Overall dimensions: 1099 mm (43.27") W x 699 mm (27.52") H



### **3.0 ALTERATION(S)**

Alteration(s) performed in the laboratory on tested specimen to meet the reported performances:

Air Leakage Resistance & Water Leakage Resistance Tests:

- (1) Sealant at each corner before horizontal glazing stops installation. Sealant each corner on top of horizontal glazing stops before installing vertical glazing stops.

Uniform Load Structural Test:

- (1) The sash snubber was secured with (3) #8 x 3/8" pan head screws.

### **4.0 TEST BENCH INFORMATION**

Information regarding the Test Bench and related instrumentation used for testing:

Testing was performed on Air-Ins Inc. test bench identified as TB-28-DC. The calibration of this test bench was done as per Article 9.0 of *ASTM E283, Standard Test Method for Rate of Air Leakage through Exterior Windows, Curtain Walls and Doors*, and *ASTM E331 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference* and *ASTM E547 Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cycling Static Air Pressure Difference*.

Latest calibration of this test bench and related equipment dates to July, 2011 and January 2012.



**5.0 RESULTS OF PERFORMANCE TESTS**

**5.1 TEST SPECIMEN PRIMARY TESTING**

TEST	<div style="border: 1px solid black; padding: 5px; display: inline-block; font-size: 2em; font-weight: bold; margin-right: 10px;">LC</div> CLASS SPECIFICATIONS	TEST RESULTS	GRADE OR COMMENT
Operating Force Test	<u>U.S. (only) requirements:</u> Force to initiate motion: Reported only Force to maintain motion < 30 N (7 lbf) Force to latch < 100 N (22.5 lbf) <u>Canadian (only) requirements:</u> Force to initiate motion: (normal use) < 60 N (13 lbf) (cleaning/maintenance) < 70 N (15 lbf) Force to maintain motion: (normal use) < 30 N (7 lbf) (cleaning/maintenance) < 45 N (10 lbf) Force to latch < 100 N (22.5 lbf) AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.1.1 & ASTM-E2068-00 (2008)	Measured to initiate = 11 N (2.5 lbf) Measured to maintain = 8 N (1.75 lbf) Measured to latch = 40 N (9 lbf)	Passed
Air Leakage Resistance Test	$Q_{inf} \leq 1.5 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $\leq 0.3 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ ) AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.2.1 & ASTM-E283-04	Surface: $0.96 \text{ m}^2 (10.33 \text{ ft}^2)$ $Q_{inf} = 0.29 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $0.06 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ )	Passed
	<u>Canadian air infiltration/exfiltration level:</u> A2: $Q_{inf} \& \text{ exf} \leq 1.5 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $\leq 0.3 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ ) A3: $Q_{inf} \& \text{ exf} \leq 0.5 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $\leq 0.1 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ ) AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.2.2 & ASTM-E283-04	$Q_{inf} = 0.29 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $0.06 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ ) $Q_{exf} = 0.28 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $0.06 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ ) $Q_{avg} = 0.29 \text{ l/s-m}^2 @ 75 \text{ Pa}$ ( $0.06 \text{ cfm/ft}^2 @ 1.57 \text{ psf}$ )	A3 level
Water Resistance Test	No water infiltration under a minimum pressure differential of 180 Pa (3.75 psf) AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.3.2 & ASTM-E547-00 (2009)	No water infiltration under a pressure differential of 730 Pa (15.00 psf)	100
Uniform Load Deflection Test	Deflection at 1200 Pa (25.00 psf) minimum class level and at optional Design Pressure (DP) performance level. AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.4.2 & ASTM-E330-02 (2010)	Net deflection measured on the sash lower rail (operator): 3.53 mm @ -1200 Pa (0.14" @ -25.00 psf) 2.46 mm @ +1200 Pa (0.10" @ +25.00 psf) 12.25 mm @ -2880 Pa (0.48" @ -60.00 psf) 4.85 mm @ +2880 Pa (0.19" @ +60.00 psf) Allowed: Not applicable for this performance class	Reported only

Performance Evaluation: GP327 Series PVC Awning Window, 3-1/4" & 4-1/2" Frames





<b>Uniform Load Structural Test</b>	Permanent deformation $\leq 0.4\%$ of the member span at minimum class level of 1800 Pa (37.50 psf) and at optional Structural Test Pressure (STP) levels.  <i>AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.4.3 &amp; ASTM-E330-02 (2010)</i>	Permanent deformation measured on the sash lower rail (operator): 0.55 mm @ -1800 Pa (0.02" @ -37.50 psf) 0.14 mm @ +1800 Pa (0.01" @ +37.50 psf) 0.29 mm @ -4320 Pa (0.01" @ -90.00 psf) 0.29 mm @ +4320 Pa (0.01" @ +90.00 psf) Allowed $\leq 4.16$ mm (0.16")	<p style="text-align: center;"><b>60</b></p>
<b>Forced-Entry Resistance Test</b>	All windows shall be tested according to ASTM F588-07 performance level 10.  <i>AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.5</i>	Grade 40 of ASTM F588-07  $T_1=10$ min., $L_1=1334$ N (300 lbf), $L_2=667$ N (150 lbf)	<p style="text-align: center;"><b>Passed</b></p>

**5.2 TEST SPECIMEN AUXILIARY TESTING**

TEST	<div style="border: 1px solid black; padding: 5px; display: inline-block; font-size: 2em; font-weight: bold; margin-right: 10px;">LC</div> CLASS SPECIFICATIONS	TEST RESULTS	GRADE OR COMMENT
<b>Welded Corner Test</b>	When loaded to failure, the break shall not extend along the entire weld line.  <i>AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.6.2</i>	For each corner detail (sash and frame) the breakage does not extend along the entire weld line.	<p style="text-align: center;"><b>Passed</b></p>
<b>Awning, Hopper, Projected Hardware load Test</b>	Deflection of the of the sash corner opposite the blocking under a load of 70 N (15 lbf) while blocked at 45° or the limit of its travel.  <i>AAMA/WDMA/CSA 101/I.S.2/A440-08 par. 5.3.6.6.6</i>	Measured deflection: 9.15 mm (0.36")	<p style="text-align: center;"><b>Reported only</b></p>
<b>Insect Screen Test</b>	<u>Canadian (only) requirements:</u> Insect screens shall be tested in accordance with ASTM E1748 in the outward direction only under a load of 60 N (13 lbf).  <i>A440S1-09 Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440 par. 5.1</i>	No screen disengagement or permanent deformation under a 60 N (13 lbf) load.	<p style="text-align: center;"><b>Passed</b></p>



## **6.0 CONCLUSION**

Based on the tests results, the window described in this report meets the requirements of the AAMA/WDMA/CSA 101/I.S. 2/A440-08 Standard regarding performance testing (article 5.0).

Detailed assembly drawings showing wall thickness of all members, corner construction and hardware application are on file and have been compared to the sample submitted.

The above results were secured by using the designated test methods and they indicate compliance with the performance requirements of the referenced specification. The test records from this evaluation will be retained for a minimum of four (4) years from the date of report issuance. This report does not constitute certification of this product, which may only be granted by a certification agency.

*Note on the Limitation of Liability:*

*Due care was taken in performing the testing sequence and in reporting the results related to the test specimen received for evaluation. Through acceptance of this report, the Client agrees to exempt Air-Ins Inc. employees and owners from all liability claims and demands arising from any matter related to or concerning the quality and execution of the performance evaluation contained in this report.*

## **7.0 REVISION LOG**

<b>Rev. #</b>	<b>Date</b>	<b>Page(s)</b>	<b>Revision(s)</b>