



# NATIONAL CERTIFIED TESTING LABORATORIES

FIVE LEIGH DRIVE • YORK, PENNSYLVANIA 17406 • TELEPHONE (717) 846-1200  
FAX (717) 767-4100  
www.nctlinc.com

**AAMA/WDMA/CSA 101/I.S.2/A440-08**

## TEST REPORT SUMMARY

**Rendered to:**

**NEON ENERGY**  
230 Park Avenue, 10th Floor  
New York, NY 10169

**PRODUCT TYPE: Dual Action Window**

**SERIES/ MODEL: "Dual Action"**

Title	Summary of Results
Primary Product Designator AAMA/WDMA/CSA 101/I.S.2/A440-08	Class AW-PG45: Size tested 1524 x 2515 mm (60 x 99 in) - Type DAW
Design Pressure	±2160 Pa (±45.0 psf)
Air Infiltration	0.1 L/s/m <sup>2</sup> (<0.01 cfm/ft <sup>2</sup> ) – Prior to Cycling 0.1 L/s/m <sup>2</sup> (0.01 cfm/ft <sup>2</sup> ) – After Cycling
Water Penetration Resistance Test Pressure	580 Pa (12.0 psf) – Prior to and After Cycling
Uniform Load Structural Test Pressure	±3240 Pa (±67.5 psf)
Forced Entry Resistance	ASTM F588-07 - Grade 10 Pass

Test Completed: 07/19/16

Reference must be made to Report No. NCTL-110-19251-6 dated 09/13/16 for complete test specimen description and data.

**For National Certified Testing Laboratories**

DIGITAL SIGNATURE

Jay Leader  
Technician



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## **AAMA/WDMA/CSA 101/I.S.2/A440-08**

### **STRUCTURAL TEST REPORT**

## **NCTL-110-19251-6**

REPORT TO:  
NEON ENERGY  
230 PARK AVENUE, 10TH FLOOR  
NEW YORK, NY 10169

REPORT NUMBER: NCTL-110-19251-6  
REPORT DATE: 09/13/16

PRODUCT TYPE:  
DUAL ACTION WINDOW

SERIES/ MODEL:  
"DUAL ACTION"



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**Report Number** NCTL-110-19251-6  
**Report Date** 09/13/16  
**Report To** Neon Energy  
230 Park Avenue, 10th Floor  
New York, NY 10169  
**Date Testing Started** 07/12/16  
**Date Testing Completed** 07/19/16  
**Specification** AAMA/WDMA/CSA 101/I.S.2/A440-08  
NAFS North American Fenestration Standard/Specification for windows,  
doors, and skylights  
**Performance Results** AAMA/WDMA/CSA 101/I.S.2/A440-08  
Class AW-PG45: Size tested 1524 x 2515 mm (60 x 99 in)-Type DAW

## ***Description of Specimen Tested***

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Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

**Model/ Series** "Dual Action"  
**Configuration** Dual Action Window  
**Frame Size** Overall  
1524 mm x 2515 mm (60" x 99")  
**Vent Size** 1480 mm x 2470 mm (58.25" x 97.25")  
**Viewing Area** 1330 mm x 2321 mm (52.375" x 91.375")  
**Frame & Vent Type** Extruded aluminum with polyamide thermal breaks  
**Joint Construction** Frame & Vent  
Mitered with epoxied aluminum staked-in-place corner gusset  
**Glazing Components**  
Overall 26.78 mm (1.055") nominal  
Glass Thickness (1) Lite of 6 mm (0.230") nominal tempered glass to the exterior and (1)  
lite of 6 mm (0.220") nominal annealed glass to the interior  
Spacer Type/Size 15.37 mm (0.605") Desiccant-filled aluminum spacer (Type A1-D)  
Glazing System Interior glazed with a multi-fin vinyl glazing gasket and a snap-in extruded  
aluminum glazing bead with a flexible multi-fin gasket  
**Weatherstrip**  
Type (1) Strip neoprene  
Location Vent and frame perimeter 44.45 mm (1.75") notch was located at 101.6  
mm (4") from the ends of the head  
Type (1) Strip gooseneck vinyl  
Location Center frame perimeter

**Operating Hardware**

## Locks

Type

Single handle (13)-point integrated lock system

Location

1019 mm (40.125") From the bottom of the lock stile with (4) lock points on the stiles, (2) lock points at the top rail and (3) lock points at the bottom rail

## Keeper

Type

Metal

Location

Frame at the lock locations

## Hinge Hardware

Type

Dual action hinge hardware

Location

Top rail/ top of the hinge jamb and bottom rail/ bottom of the hinge jamb

Type

Pin-type

Location

Bottom of the hinge stile/ hinge jamb

**Auxiliary**

Type

Aluminum drip edge

Location

Bottom rail fastened with screws

**Reinforcement**

No reinforcement employed

**Weep Description**

Size

25.4 mm (1") wide by 7.95 mm (0.313") high with plastic cover

Location

130.18 mm (5.125") From each end and midspan of exterior sill face

Size

19.05 mm (0.75") wide by 4.78 mm (0.188") high

Location

120.65 mm (4.75"), 241.3 mm (9.5"), 356 mm (14"), 464 mm (18.25"), 578 mm (22.75") and 686 mm (27") From each end of the sill track

Size

7.95 mm (0.313") Diameter weep hole

Location

139.7 mm (5.5"), 152.4 mm (6"), 247.65 mm (9.75"), 997 mm (39.25"), 2289 mm (90.125") and 2302 mm (90.625") From the bottom of the hinge stile

Size

4.78 mm (0.188") Diameter weep hole

Location

123.83 mm (4.875"), 133.35 mm (5.25") and 142.88 mm (5.625") From the bottom of the hinge stile

Size

7.95 mm (0.313") Diameter weep hole

Location

267 mm (10.5"), 1524 mm (60") and 1918 mm (75.5") From the bottom of the lock stile

Size

6.35 mm (0.25") Diameter weep hole

Location

139.7 mm (5.5") and 1861 mm (73.25") From the bottom of the lock stile

Size

22.23 mm (0.875") wide by 4.78 mm (0.188") high

Location

171.45 mm (6.75") and 337 mm (13.25") From ends of the bottom rail glazing track

Size

19.05 mm (0.75") wide by 6.35 mm (0.25") high

Location

139.7 mm (5.5") From each end and midspan of the bottom rail

Size

7.95 mm (0.313") Diameter weep hole

Location

171.45 mm (6.75"), 203.2 mm (8"), 2413 mm (9.5"), 273 mm (10.75"), 298 mm (11.75") and 546 mm (21.5") From each end of the bottom rail

**Interior/ Exterior  
Surface Finish**

White painted aluminum

**Sealant**

Type

Silicone

Location

Screw heads at the sill

**Insect Screen** No screen employed

**Installation Method** The window was installed in a 50.8 mm x 254 mm (2" x 10") spruce-pine-fir lumber test buck and was secured with (1) #10 x 38.1 mm (1.5") pan head screw located at 152.4 mm (6"), 559 mm (22") from each end of the head and sill and 152.4 mm (6"), 533 mm (21"), 826 mm (32.5"), 1194 mm (47"), 1905 mm (75") and 2356 mm (92.75") from the bottom of each jamb. The exterior perimeter was sealed with silicone sealant.

### **Test Results - AAMA/WDMA/CSA 101/I.S.2/A440-2008**

<u>Paragraph</u>	<u>Test</u>
5.3.2.1/ 9.3.2	Air Leakage Resistance ASTM E283-04(12)
	The tested specimen meets or exceeds the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440-2008 for air infiltration at 300 Pa (6.2 psf).

Maximum Allowable = 0.5 L/s/m<sup>2</sup> (0.1 cfm/ft<sup>2</sup>)

Prior to Cycling

Extraneous Air Leakage = 1.68 L/s (3.56 cfm)  
Total Air Leakage = 1.72 L/s (3.65 cfm)  
Air Infiltration Rate = 0.1 L/s/m<sup>2</sup> (<0.01 cfm/ft<sup>2</sup>)

After Cycling

Extraneous Air Leakage = 1.54 L/s (3.27 cfm)  
Total Air Leakage = 1.83 L/s (3.87 cfm)  
Air Infiltration Rate = 0.1 L/s/m<sup>2</sup> (0.01 cfm/ft<sup>2</sup>)

<u>Paragraph</u>	<u>Test</u>
5.3.3/ 9.3.3	Water Penetration Resistance ASTM E547-00(09) and ASTM E331-00(09)

3.4 L/ (min• m<sup>2</sup>) (5.0 gph/ft<sup>2</sup>)

Prior to and After Cycling

No Leakage after 4 cycles of 5 minutes at 580 Pa (12.0 psf)

No Leakage after 1 cycle of 15 minutes at 580 Pa (12.0 psf)

**NOTE:** Tested without insect screen

<u>Paragraph</u>	<u>Test</u>
5.3.4.2/ 9.3.4.2	Uniform Load Deflection at Design Pressure ASTM E330-14

No damage after positive 2160 Pa (45.0 psf) held for 10 seconds

No damage after negative 2160 Pa (45.0 psf) held for 10 seconds

Measured Deflection <sup>Positive</sup> = 0.33 mm (0.013 inches)

Measured Deflection <sup>Negative</sup> = 0.28 mm (0.011 inches)

Maximum Allowed (L/175) = 3.84 mm (0.151 inches)

Paragraph      Test  
5.3.4.3/ 9.3.4.3 Uniform Load Structural Test  
ASTM E330-14

No damage after positive      3240 Pa (67.5 psf) held for 10 seconds  
No damage after negative      3240 Pa (67.5 psf) held for 10 seconds  
Measured Permanent Set <sub>Positive</sub> = 0.28 mm (0.011 inches)  
Measured Permanent Set <sub>Negative</sub> = 0.03 mm (0.001 inches)  
Maximum Allowed (0.2%)      = 1.35 mm (0.053 inches)

**NOTE:** Deflection and Permanent Set measurements taken on the lock stile over a 673 mm (26.5") span.

Paragraph      Test  
5.3.5/ 9.3.5 Forced Entry Resistance  
ASTM F588-07

Type B Window Assembly/ Grade 10:      = Pass

Test  
Disassembly      = No Entry  
Lock Manipulation      = No Entry  
Sash Manipulation      = No Entry  
Test B1      = No Entry  
Test B2      = No Entry  
Test B3      = No Entry  
Hardware Manipulation Test      = No Entry  
Sash Manipulation Test      = No Entry

**NOTE:** 1. T1 = 5 minutes, L1 = 667 N (150 lbf), L2 = 333 N (75 lbf), L3 = 111 N (25 lbf)  
2. Loads were held for 60 seconds.

Paragraph      Test  
7.3.4.2/ Sash/ Leaf Torsion Test  
5.3.6.4.2

Concentrated load applied 70 N (15 lbf) held for 10 seconds

Maximum Allowable Deflection      = 209.8 mm (8.26 inches)  
Measured Deflection      = 114.3 mm (4.50 inches)

Paragraph      Test  
9.3.6.4.3/ Sash/ Leaf Concentrated Load Test on the Latch Rail  
5.3.6.4.4

Concentrated load applied 270 Pa (60 psf) held for 10 seconds

Deflection Limit      = 1.5 mm (0.06 inches)  
Maximum Horizontal Deflection      = 1.02 mm (0.04 inches)

Concentrated load applied 400 Pa (90 psf) held for 10 seconds

Deflection Limit      = 6.4 mm (0.25 inches)  
Maximum Vertical Deflection      = 5.59 mm (0.22 inches)

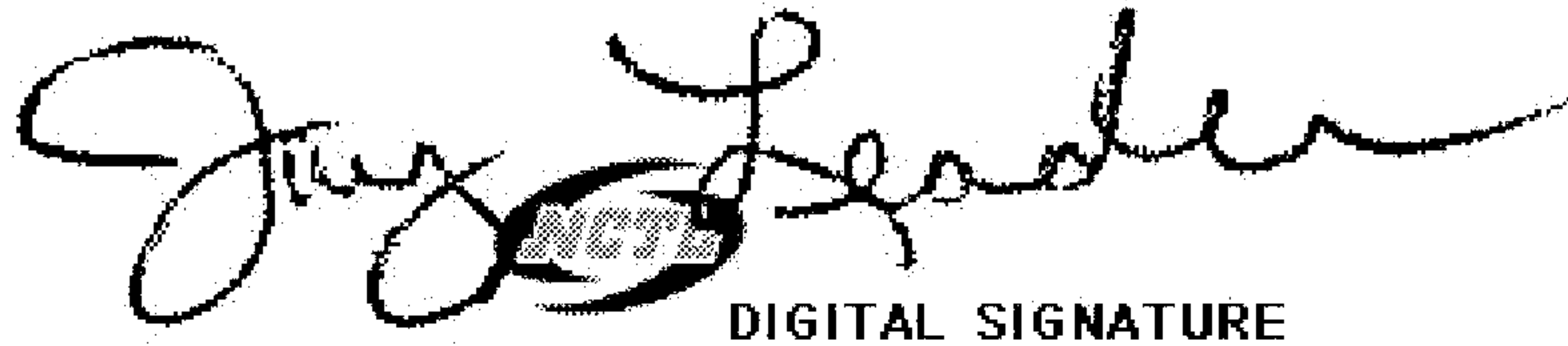
**NOTE:** Load applied in both directions and maximum deflection reported

<u>Paragraph</u>	<u>Test</u>
5.3.6.9	Life Cycle Testing AAMA 910-93
	<u>1<sup>st</sup> Half - Vent / Sash / Panel - 1250 Total Cycles</u>
	2.1.4 Vent/ Sash/ Panel Cycling Testing
	2.2.4.4 Dual Action = Pass
	2.1.5 Locking Hardware Cycle Testing
	2.3 Locking Hardware Cycling = Pass
	2.1.7 Misuse Testing
	2.5.7.1 Stabilizing Arm Load = Pass
	2.5.7.2 Vertical Load Test = Pass
	<u>2<sup>nd</sup> Half - Vent / Sash / Panel - 1250 Total Cycles</u>
	2.2.4.4 Dual Action = Pass
	2.1.9 Locking Hardware Cycle Testing
	2.3 Locking Hardware Cycling = Pass

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This test report was prepared by National Certified Testing Laboratory (NCTL), for the exclusive use of the above named client and it does not constitute certification of this product. The results are for the particular specimen tested and do not imply the quality of similar or identical products manufactured or installed from specifications identical to the tested product. The test specimen was supplied to NCTL by the above named client. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen are to be drawn from the ASTM E330 test. Forced entry resistance test equipment used is in compliance with Section 7 of the ASTM F588-07 test method. Foam tape is mounted to the perimeter of the test buck prior to clamping to the test wall. It is the assertion of this laboratory that any film employed during testing does not affect measurement values. NCTL is a testing lab and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed. The results in this report are actual tested values and are applicable to the specimen tested only, using the components and construction methods described herein.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. Component drawings were reviewed for product verification. The bill of materials contains details with any deviations noted. Ambient conditions during the referenced testing are available upon request. A copy of this report along with representative sections of the test specimen will be retained per applicable requirements by NCTL. This report does not constitute certification or approval of the product, which may only be granted by a certification program validator or recognized approval entity. All tests were conducted in full compliance with the referenced specifications and/or test methods. Tests were performed in the order set forth by the applicable standard or specification. This report is the joint property of National Certified Testing Laboratories Inc. and the Client to whom it is issued. Permission to reproduce this report by anyone other than National Certified Testing Laboratories Inc and the Client must be granted in writing by both of the above parties. This report may not be reproduced, except its entirety, without the written consent of NCTL.

**National Certified Testing Laboratories**A handwritten signature in black ink that reads "Jay Leader". The signature is fluid and cursive. Below the signature is a small, semi-transparent circular stamp with some illegible text inside.

DIGITAL SIGNATURE

Jay Leader  
TechnicianA handwritten signature in black ink that reads "R. H. Zeiders". The signature is fluid and cursive. Below the signature is a small, semi-transparent circular stamp with some illegible text inside.DIGITAL  
SIGNATURERobert H. Zeiders, P.E.  
Vice-President Engineering & Quality

JL/ dro

Attachments

Appendix A – Revision Summary

Appendix B – Drawings

**Appendix A**  
**Revision Log**

<u>Identification</u>	<u>Date</u>	<u>Page &amp; Revision</u>
Original Issue	09/13/16	Not Applicable

## **Appendix B**

### **Drawings**

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were reviewed (as submitted) for Product Verification. Detailed assembly drawings showing wall thicknesses of all members, corner construction and hardware application are on file and have been compared to the test sample submitted.  
(Reference: NCTL-110-19251-6)

See Attached Documentation;  
any deviations noted.

Note: The above referenced component drawings (if applicable) along with representative sections of the test specimen will be retained by NCTL per applicable retention requirements. This testing facility assumes that all information provided by the client is accurate.

**Description of test specimen No 9 & 10:**

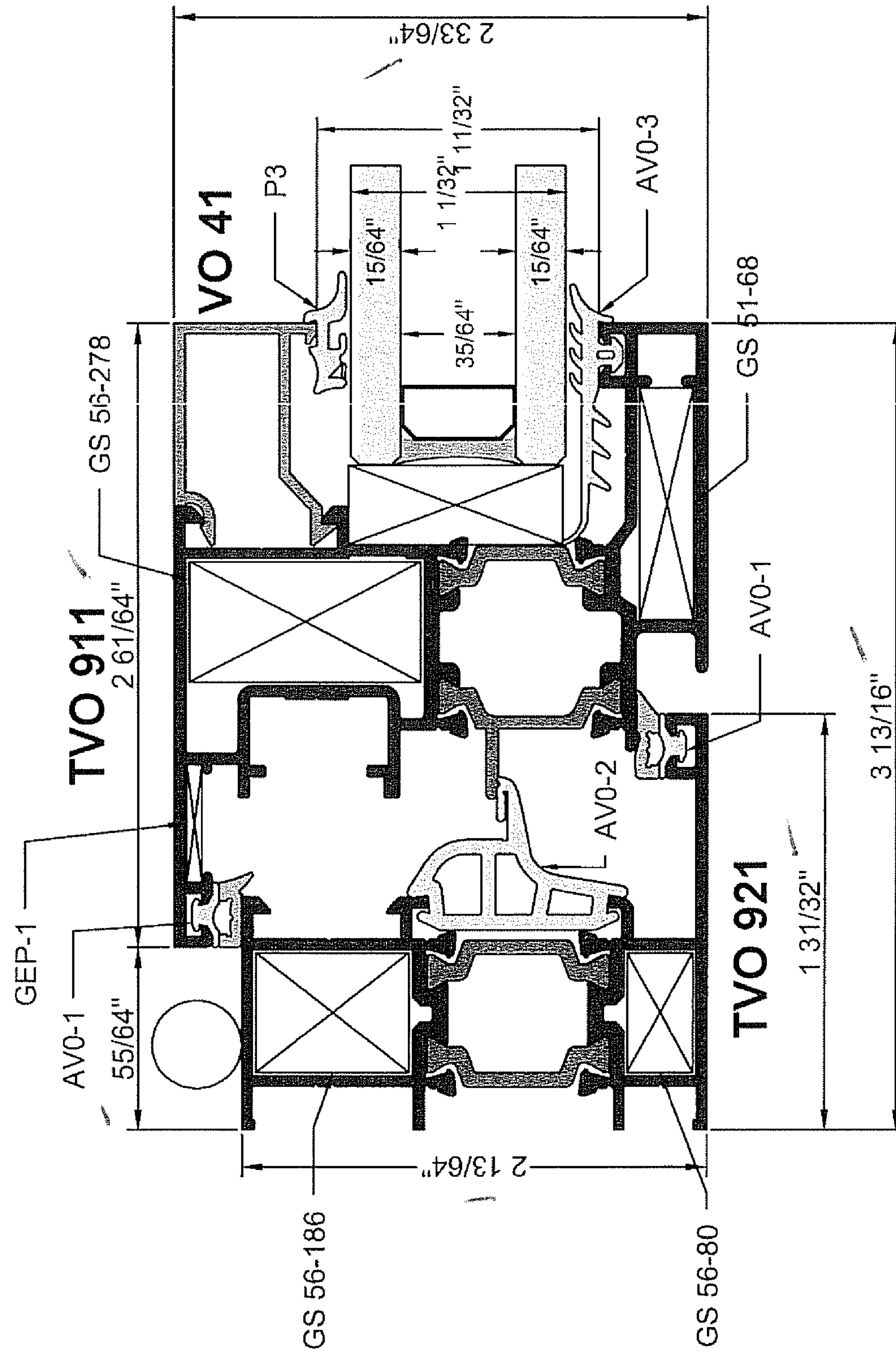
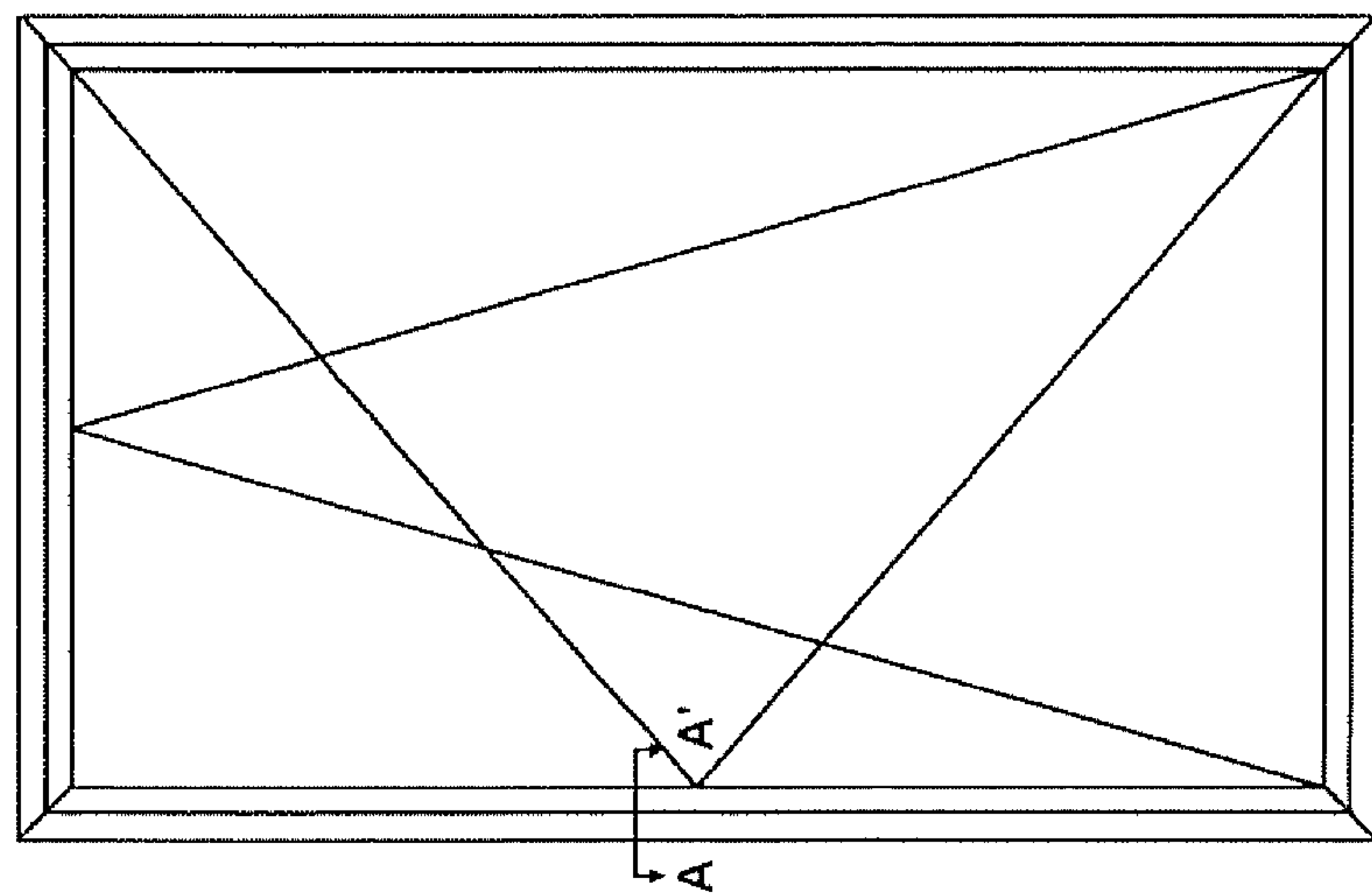
Product	Dual action window
Manufacturer	Alco Hellas S.A.
Date of manufacture	3/6/2016
System	Ultra 2016 Opening System
Type of opening / Opening directions	Active casement; turn & tilt, inward opening
Frame material	Aluminum profiles with thermal break
Overall frame dimensions (WxH)	5' 0" x 8' 3"
<b>Frame member</b>	Profile No TVO 921
Frame joint	mitred, compressed and bonded with corner connection No GS 56-80 and GS 152-186
<b>Casement member</b>	Profile No TVO 911
Frame joint	mitred, compressed and bonded with corner connection No GS 56-278, GS 51-68 and GEP-1
Additional profiles	Weather bar profile No VO 44, bolted, sealed with resilient sealing, lateral with end caps No AVO-04
<b>Rebate seal</b>	
<u>Internal:</u>	
Material	Sealing material – EPDM
Item No	AVO-01
Corner design	mitred and bonded
<u>Center:</u>	
Material	Sealing material – EPDM
Item No	AVO-02
Corner design	mitred and bonded
<u>External:</u>	
Material	Sealing material – EPDM
Item No	AVO-01
Corner design	mitred and bonded
<b>Infill panel</b>	Glass Unit
Configuration	from inside to outside: 15/64" glass, 35/64" airspace, 15/64" glass
<b>Incorporation of infill panel</b>	
<b>Glazing gasket</b>	
<u>Internal:</u>	
Material	Sealing material – EPDM
Item No	P3
Corner design	mitred and bonded
<u>Glazing bead</u>	Profile No VO 41
Corner design	butt-jointed
Fixing	clamped
<u>External:</u>	
Material	Sealing material – EPDM
Item No	AVO-03
Corner design	mitred and bonded
<b>Hardware</b>	
Type / manufacturer	NT / Roto

TEST SPECIMEN COMPLIES  
WITH THESE DETAILS.  
ANY DEVIATION IS NOTED  
REPORT NO. NCTL-110-17251-6  
TEST DATE 7/17/16

**HORIZONTAL SECTION A-A'**

**KA. 1:1**

**TEST SPECIMENT No 9 & No 10**

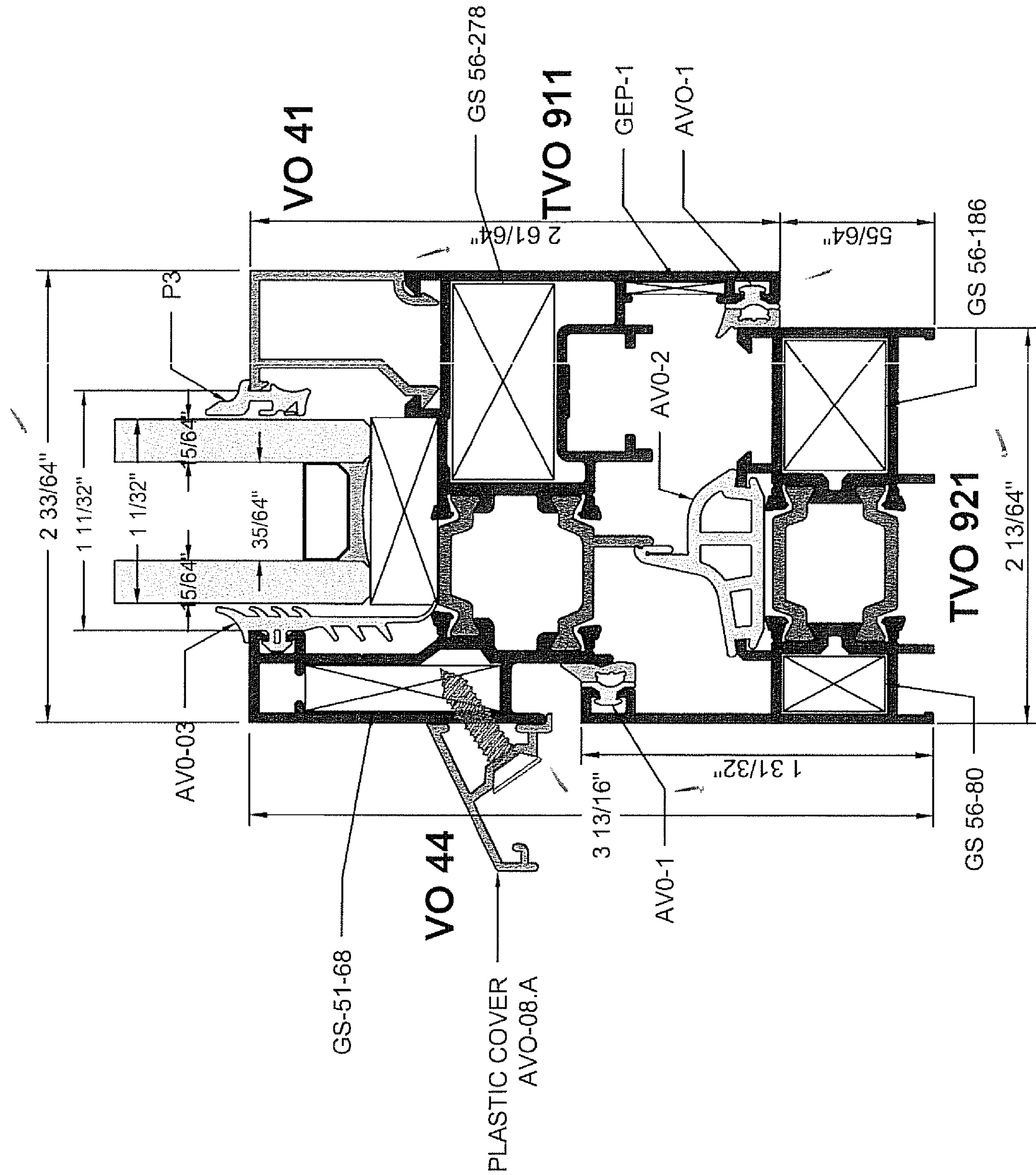
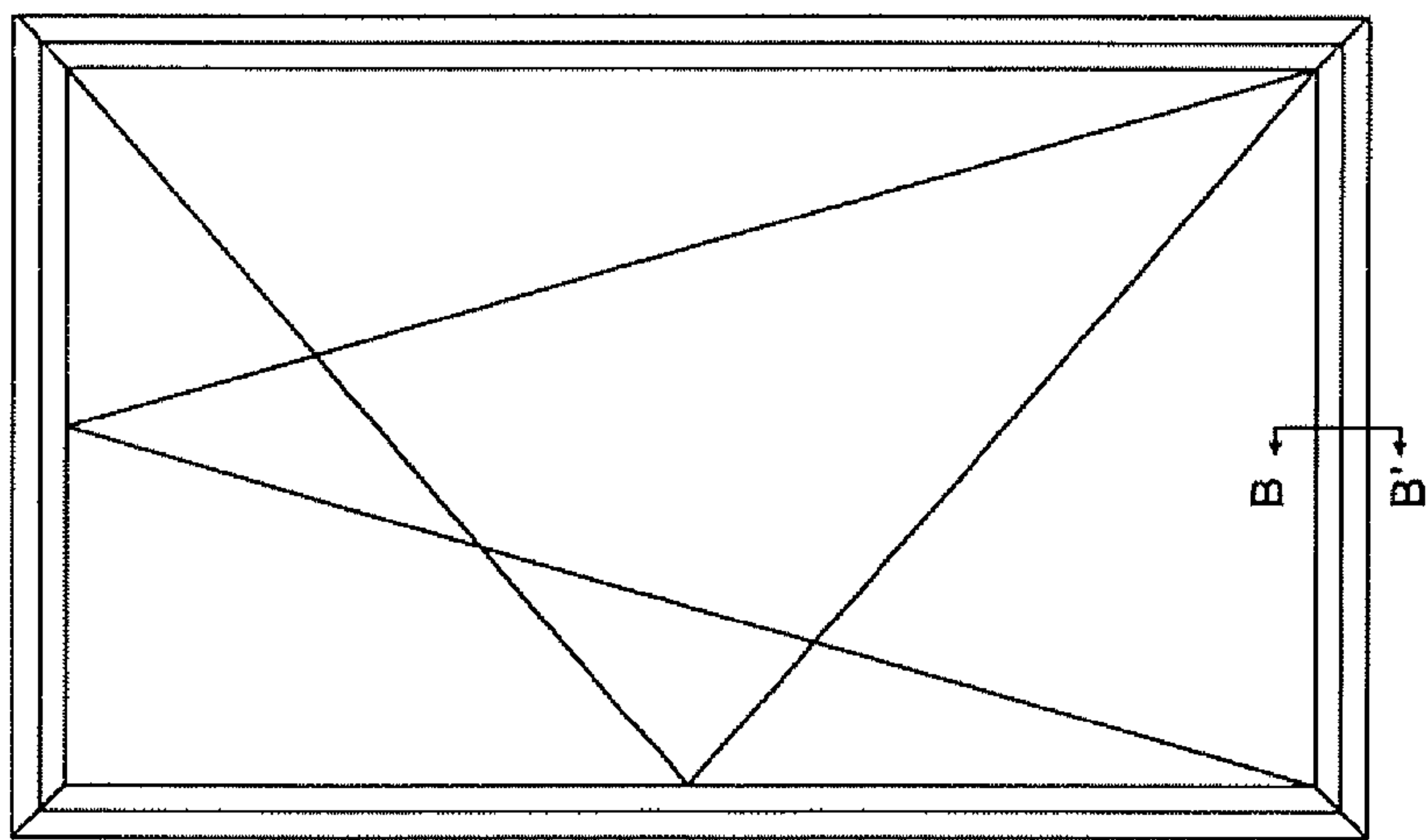


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 REPORT NO. NCTL-110-19251-6  
 TEST DATE 7/19/16

**VERTICAL SECTION B-B'**

**KA. 1:1**

**EST SPECIMENT No 9 & No 10**



TEST SPECIMEN COMPLIES  
WITH THESE DETAILS.  
ANY DEVIATION IS NOTED  
REPORT NO. NCTL-110-19251-G  
TEST DATE 7/19/16