

**NFRC U-FACTOR, SHGC, VT, &
CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT**

**Rendered to:
NORTH EAST WINDOWS, USA, INC.**

**SERIES/MODEL:
Series PW630 Picture Window**

**Report Number: G1969.01-116-45
Report Date: 10/10/16**

**NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT**

Rendered to:
NORTH EAST WINDOWS, USA, INC.
One Kees Place
Merrick, New York 11566

Report Number: G1969.01-116-45
Simulation Date: 10/10/16
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Project Summary:

Architectural Testing, Inc., an Intertek Company (Intertek-ATI) was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed
**NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

Standards:

ANSI/NFRC 100-2014: Procedure for Determining Fenestration Product U-Factors
ANSI/NFRC 200-2014: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
NFRC 500-2014: Procedure for Determining Fenestration Product Condensation Resistance Values

Software:

Frame and Edge Modeling: THERM 7.4.3
Center-of-Glass Modeling: WINDOW 7.4.8
Total Product Calculations: WINDOW 7.4.8
Spectral Data Library: IGDB 49.0

Simulations Specimen Description:

Series/Model: Series PW630 Picture Window
Type: Fixed, 4-Sided
Frame Material: VY Vinyl
Sash Material: NA Not Applicable
Standard Size: 1200mm x 1500mm

Modeling Assumptions/Technical Interpretations:

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) Grids do not require modeling per the NFRC 3mm rule.
- 3) The flange and fin were not modeled as they are deemed removable.

Specialty Products Table:

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 7.4.8. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.005699	0.008565	0.011271
SHGC1	0.831782	0.747636	0.668169
VT0	0.000000	0.000000	0.000000
VT1	0.826083	0.739071	0.656898

$$SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)$$

$$VT = VT0 + VTc (VT1 - VT0)$$

Validation Matrix:

The following products are part of a validation matrix. Only one is required for validation testing.

<i>Product Line</i>	<i>Report Number</i>
None	-

Spacer Option Description

<i>Spacer Type</i>	<i>Sealant</i>		<i>Code</i>
	<i>Primary</i>	<i>Secondary</i>	
Quanex Duraseal Spacer	Butyl Rubber	-	A8-S
Quanex Duralite Spacer	Butyl Rubber	-	P1-S

Grid Option Description

<i>Grid Size</i>	<i>Grid Type</i>	<i>Grid Pattern</i>
0.188" x 0.625"	Aluminum rectangular muntin (Painted)	NFRC Standard

Reinforcement Option Description

<i>Location</i>	<i>Material</i>
None	

Gas Filling Technique Description

<i>Fill Type</i>	<i>Method</i>
90% Argon	Single or Dual Probe
95% Argon	Two-probe with concentration sensor

Edge-of-Glass Construction

<i>Interior Condition</i>	PVC bead with vinyl fins
<i>Exterior Condition</i>	PVC leg with silicone

Weatherstripping

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
None		

Frame/Sash Materials Finish

<i>Interior</i>	Vinyl
<i>Exterior</i>	Vinyl

NFRC 100/200/500 Summary Sheet
Series PW630 Picture Window

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grid: (None / <1 / =>1)				Visible Transmittance (VT) Grid: (None / <1 / =>1)		Condensation Resistance		
1	CLR/AIR/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR			CL	A8-S N,G
	U-Factor 0.47			SHGC (N / <1) 0.67 / 0.60				VT (N / <1) 0.68 / 0.61		CR 44		
2	CLR/AIR/CS36 (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR	0.027(#3)		CL	A8-S N,G
	U-Factor 0.32			SHGC (N / <1) 0.40 / 0.36				VT (N / <1) 0.56 / 0.50		CR 57		
3	CLR/AIR/CLR (DS/DS) 3/4"											
	0.117	0.500	0.117					AIR			CL	A8-S N,G
	U-Factor 0.47			SHGC (N / <1) 0.66 / 0.59				VT (N / <1) 0.68 / 0.61		CR 44		
4	CLR/AIR/CS36 (DS/DS) 3/4"											
	0.117	0.500	0.128					AIR	0.027(#3)		CL	A8-S N,G
	U-Factor 0.32			SHGC (N / <1) 0.39 / 0.35				VT (N / <1) 0.55 / 0.49		CR 56		
5	CLR/ARG90/CS36 (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.027(#3)		CL	A8-S N,G
	U-Factor 0.28			SHGC (N / <1) 0.40 / 0.36				VT (N / <1) 0.56 / 0.50		CR 61		
6	CLR/ARG90/CS36 (DS/DS) 3/4"											
	0.117	0.500	0.128					ARG90	0.027(#3)		CL	A8-S N,G
	U-Factor 0.28			SHGC (N / <1) 0.39 / 0.36				VT (N / <1) 0.55 / 0.49		CR 60		
7	CS36/AIR/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR	0.027(#2)		CL	A8-S N,G
	U-Factor 0.32			SHGC (N / <1) 0.31 / 0.28				VT (N / <1) 0.56 / 0.50		CR 57		
8	CS36/AIR/CLR (DS/DS) 3/4"											
	0.128	0.500	0.117					AIR	0.027(#2)		CL	A8-S N,G
	U-Factor 0.32			SHGC (N / <1) 0.31 / 0.28				VT (N / <1) 0.55 / 0.49		CR 56		
9	CS36/ARG90/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.027(#2)		CL	A8-S N,G
	U-Factor 0.28			SHGC (N / <1) 0.30 / 0.28				VT (N / <1) 0.56 / 0.50		CR 60		
10	CS36/ARG90/CLR (DS/DS) 3/4"											
	0.128	0.500	0.117					ARG90	0.027(#2)		CL	A8-S N,G
	U-Factor 0.28			SHGC (N / <1) 0.30 / 0.27				VT (N / <1) 0.55 / 0.49		CR 60		

NFRC 100/200/500 Summary Sheet
Series PW630 Picture Window

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor		Solar Heat Gain Coefficient (SHGC) Grid: (None / <1 / =1)				Visible Transmittance (VT) Grid: (None / <1 / =1)					
11	SB70/ARG95/CS73 (SS/SS) 3/4"											
	0.089	0.563	0.087					ARG95	0.018(#2) / 0.148(#4)	CL	A8-S	N,G
	U-Factor 0.24		SHGC (N / <1) 0.22 / 0.20				VT (N / <1) 0.50 / 0.45		CR 48			
12	E366/ARG95/CS73 (SS/SS) 3/4"											
	0.087	0.563	0.087					ARG95	0.022(#2) / 0.148(#4)	CL	A8-S	N,G
	U-Factor 0.24		SHGC (N / <1) 0.22 / 0.20				VT (N / <1) 0.50 / 0.45		CR 48			
13	CS28/AIR/CS73 (DS/DS) 3/4"											
	0.125	0.500	0.123					AIR	0.021(#2) / 0.148(#4)	CL	A8-S	N,G
	U-Factor 0.26		SHGC (N / <1) 0.23 / 0.21				VT (N / <1) 0.47 / 0.42		CR 43			
14	CLR/AIR/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR		CL	P1-S	N,G
	U-Factor 0.46		SHGC (N / <1) 0.67 / 0.60				VT (N / <1) 0.68 / 0.61		CR 46			
15	CLR/AIR/CS36 (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR	0.027(#3)	CL	P1-S	N,G
	U-Factor 0.31		SHGC (N / <1) 0.40 / 0.36				VT (N / <1) 0.56 / 0.50		CR 60			
16	CLR/AIR/CLR (DS/DS) 3/4"											
	0.117	0.500	0.117					AIR		CL	P1-S	N,G
	U-Factor 0.46		SHGC (N / <1) 0.66 / 0.59				VT (N / <1) 0.68 / 0.61		CR 46			
17	CLR/AIR/CS36 (DS/DS) 3/4"											
	0.117	0.500	0.128					AIR	0.027(#3)	CL	P1-S	N,G
	U-Factor 0.31		SHGC (N / <1) 0.39 / 0.35				VT (N / <1) 0.55 / 0.49		CR 59			
18	CLR/ARG90/CS36 (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.027(#3)	CL	P1-S	N,G
	U-Factor 0.27		SHGC (N / <1) 0.40 / 0.36				VT (N / <1) 0.56 / 0.50		CR 65			
19	CLR/ARG90/CS36 (DS/DS) 3/4"											
	0.117	0.500	0.128					ARG90	0.027(#3)	CL	P1-S	N,G
	U-Factor 0.27		SHGC (N / <1) 0.39 / 0.36				VT (N / <1) 0.55 / 0.49		CR 64			
20	CS36/AIR/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					AIR	0.027(#2)	CL	P1-S	N,G
	U-Factor 0.31		SHGC (N / <1) 0.31 / 0.28				VT (N / <1) 0.56 / 0.50		CR 60			

NFRC 100/200/500 Summary Sheet
Series PW630 Picture Window

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids: (None / <1 / >=1)				Visible Transmittance (VT) Grids: (None / <1 / >=1)		Condensation Resistance		
21	CS36/AIR/CLR (DS/DS) 3/4"											
	0.128	0.500	0.117					AIR	0.027(#2)	CL	P1-S	N,G
	U-Factor 0.31			SHGC (N / <1) 0.31 / 0.28				VT (N / <1) 0.55 / 0.49		CR 59		
22	CS36/ARG90/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.027(#2)	CL	P1-S	N,G
	U-Factor 0.27			SHGC (N / <1) 0.30 / 0.28				VT (N / <1) 0.56 / 0.50		CR 64		
23	CS36/ARG90/CLR (DS/DS) 3/4"											
	0.128	0.500	0.117					ARG90	0.027(#2)	CL	P1-S	N,G
	U-Factor 0.27			SHGC (N / <1) 0.30 / 0.27				VT (N / <1) 0.55 / 0.49		CR 63		
24	SB70/ARG95/CS73 (SS/SS) 3/4"											
	0.089	0.563	0.087					ARG95	0.018(#2) / 0.148(#4)	CL	P1-S	N,G
	U-Factor 0.23			SHGC (N / <1) 0.22 / 0.20				VT (N / <1) 0.50 / 0.45		CR 52		
25	E366/ARG95/CS73 (SS/SS) 3/4"											
	0.087	0.563	0.087					ARG95	0.022(#2) / 0.148(#4)	CL	P1-S	N,G
	U-Factor 0.23			SHGC (N / <1) 0.22 / 0.20				VT (N / <1) 0.50 / 0.45		CR 51		
26	CS28/AIR/CS73 (DS/DS) 3/4"											
	0.125	0.500	0.123					AIR	0.021(#2) / 0.148(#4)	CL	P1-S	N,G
	U-Factor 0.25			SHGC (N / <1) 0.23 / 0.21				VT (N / <1) 0.47 / 0.42		CR 46		
27	CS28/ARG90/CS73 (SS/SS) 3/4"											
	0.087	0.563	0.087					ARG90	0.023(#2) / 0.148(#4)	CL	P1-S	N,G
	U-Factor 0.23			SHGC (N / <1) 0.23 / 0.21				VT (N / <1) 0.49 / 0.44		CR 51		
28	70-36/ARG90/CLR (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.036(#2)	CL	P1-S	N,G
	U-Factor 0.28			SHGC (N / <1) 0.32 / 0.29				VT (N / <1) 0.58 / 0.52		CR 64		
29	70-36/ARG90/CLR (DS/DS) 3/4"											
	0.117	0.500	0.117					ARG90	0.036(#2)	CL	P1-S	N,G
	U-Factor 0.27			SHGC (N / <1) 0.32 / 0.29				VT (N / <1) 0.58 / 0.52		CR 63		
30	CLR/ARG90/70-36 (SS/SS) 3/4"											
	0.090	0.563	0.090					ARG90	0.036(#3)	CL	P1-S	N,G
	U-Factor 0.28			SHGC (N / <1) 0.41 / 0.37				VT (N / <1) 0.58 / 0.52		CR 64		

NFRC 100/200/500 Summary Sheet
Series PW630 Picture Window

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type			
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grid: (None / <1 / =1)					Visible Transmittance (VT) Grid: (None / <1 / =1)		Condensation Resistance				
31	CLR/ARG90/70-36 (DS/DS) 3/4"														
	0.117	0.500	0.117					ARG90	0.036(#3)	CL	P1-S	N ₂ G			
	U-Factor		0.27		SHGC (N / <1)				0.41 / 0.37		VT (N / <1)		0.58 / 0.52		CR

The Condensation Resistance results obtained from this procedure are for controlled laboratory conditions and do not include the effects of air movement through the specimen, solar radiation, and the thermal bridging that may occur due to the specific design and construction of the fenestration system opening.

Ratings values included in this report are for submittals to an NFRC-licensed IA and are not meant to be used directly for labeling purposes. Only those values identified on a valid Certification Authorization Report (CAR) by an NFRC accredited Inspection Agency (IA) are to be used for labeling purposes. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

Intertek-ATI is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The values included in this report are not considered in compliance with ANSI/NFRC 100, ANSI/NFRC 200, and/or NFRC 500 unless the associated validation test requirements have been satisfied, as applicable.

Intertek-ATI will service this report for the entire test record retention period. Test records that are retained such as detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Intertek-ATI for the entire test record retention period. The test record retention end date for this report is August 23, 2021.

Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Intertek-ATI

For INTERTEK-ATI:

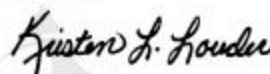
SIMULATED BY:



Digitally Signed by: Dale C. White

Dale C. White
Simulation Technician
NFRC Certified Simulator

REVIEWED BY:



Digitally Signed by: Kristen Louder

Kristen L. Louder
Senior Simulation Technician
Simulator-In-Responsible-Charge

DCW:dew

G1969.01-116-45

Attachments (pages):

Appendix A: Drawings and Bills of Material(6)

This report is complete only when all attachments listed are included.

All drawings and Bills of Material used to simulate this product are enclosed in this Appendix

Appendix A

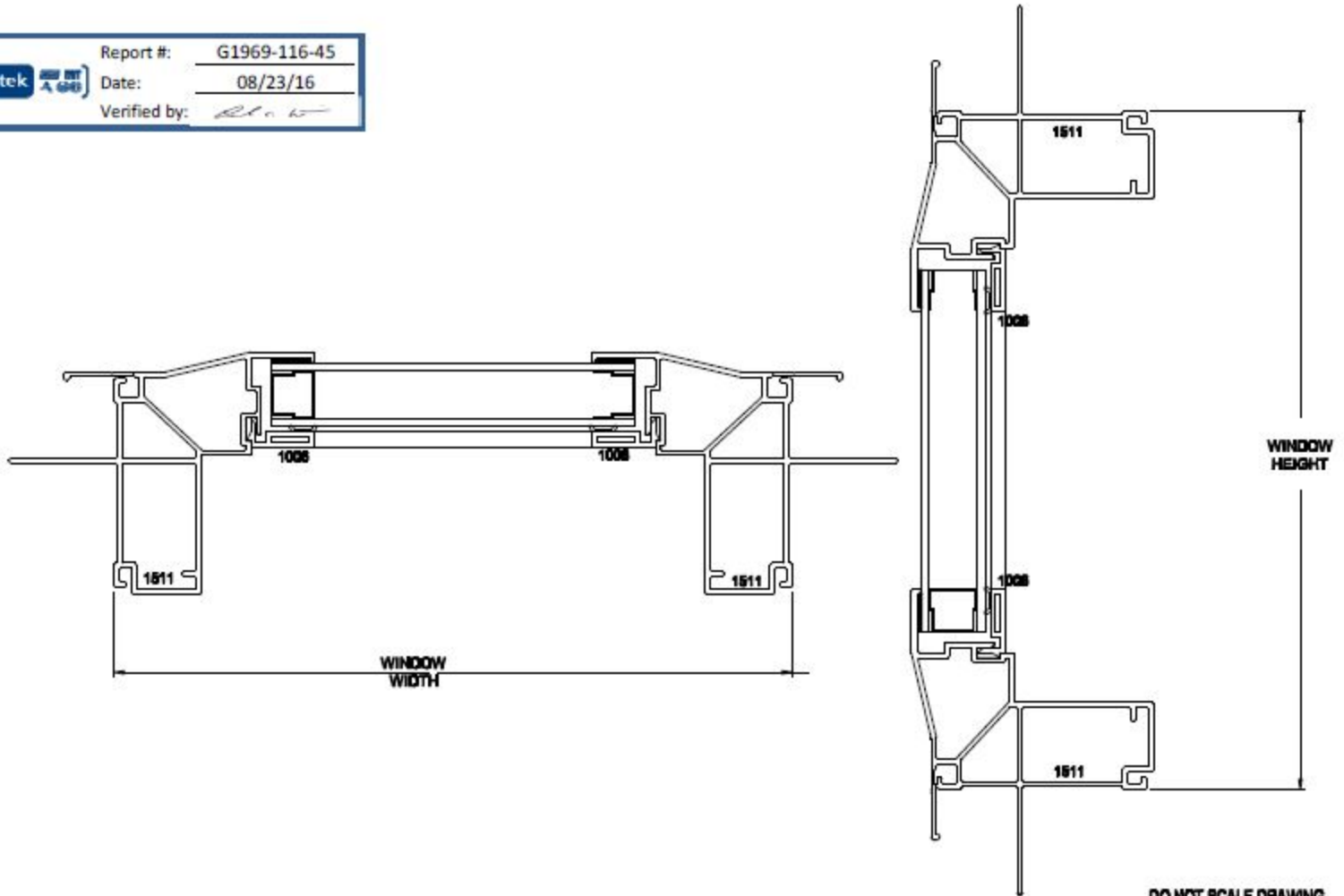
G1969.01-116-45



Report #: G1969-116-45

Date: 08/23/16

Verified by: *[Signature]*



DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

EDUCATION FOR IMPACT TEST
SPECIFICATION-LENGTHS TO 3/8"

ALLOWABLE BOW MAX. 1" PER 14'
ANGULARITY TO BE ± 1/2°

TOLERANCES- .XX ± .010
.XXX ± .005



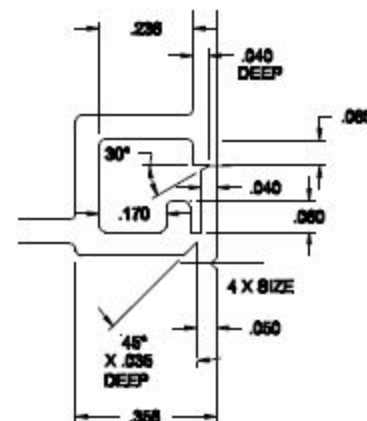
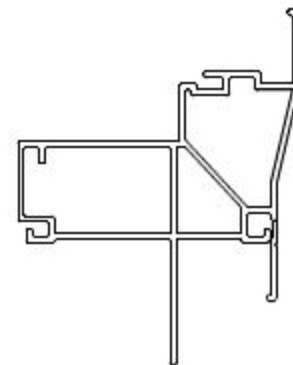
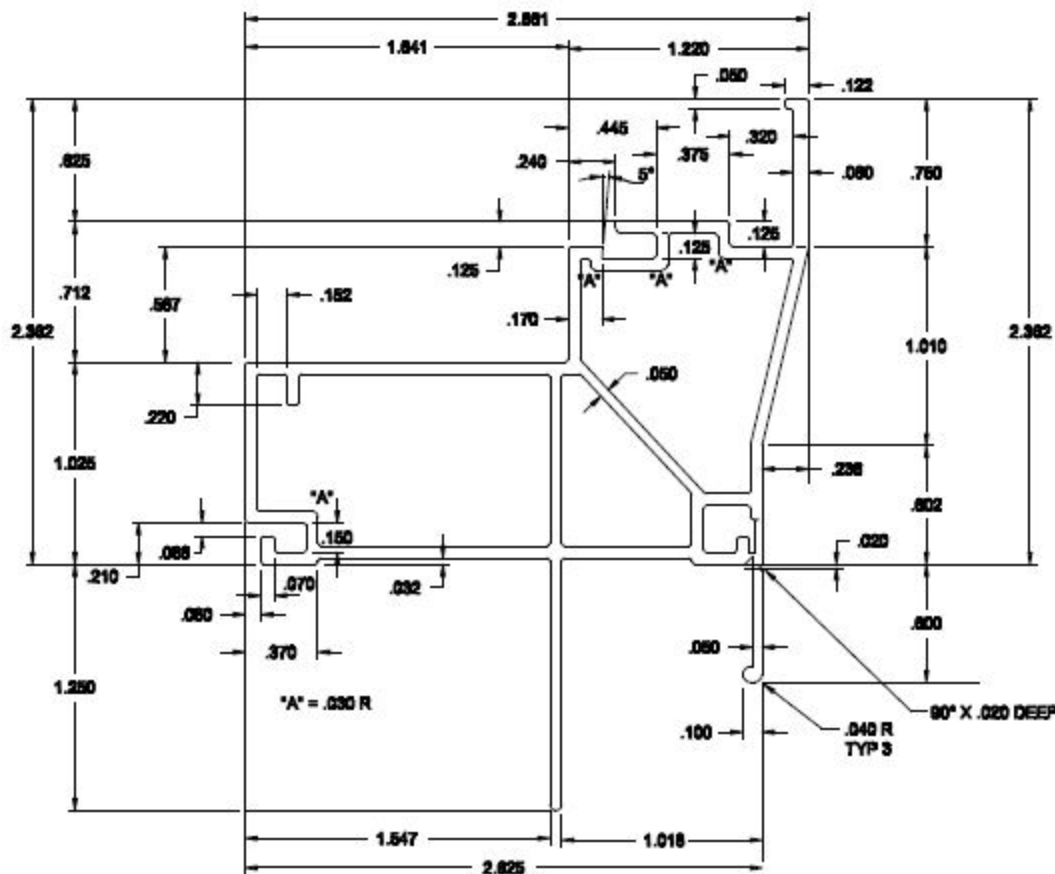
- 1) MATERIAL RIGID PVC
- 2) CAPSTOCK
- 3) UNSPECIFIED WALLS
- 4) BREAK ALL CORNERS .015R
- 5) AREA BQ.IN.
- 6) WT/FT LBS/FT.

TITLE PW830 V & H CROSS CUT				
DWG BY DDB	SCALE	DATE 08/11/16	CHKD BY	APP'D BY
COMPUTER NO.				
DWG NO C-PW830 CROSS CUT				



Report #: G1969-116-45

Date: 08/23/16

Verified by: *[Signature]*

DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

∇ LOCATION FOR IMPACT TEST
SPECIFICATION-LENGTHS TO 3/8"

ALLOWABLE BOW MAX. 1" PER 14"
ANGULARITY TO BE ± 1/2°

TOLERANCES- XX ± .010
XXX ± .005

DRAWN FOR

BY
DESIGNS

'OUR NAME SAYS IT ALL'

- 1) MATERIAL RIGID PVC
- 2) CAPSTOCK
- 3) UNSPECIFIED WALLS .080
- 4) BREAK ALL CORNERS .015 R
- 5) AREA 1.058 SQ.IN.
- 6) WT/FT .000 LBS/FT.

TITLE BUILDERS WINDOW
HEAD WITH J FLANGE/FIN

DRAWN BY DCS SCALE 2:1 DATE 8-23-16 DESIGNED BY APP'D BY

COMPUTER NO

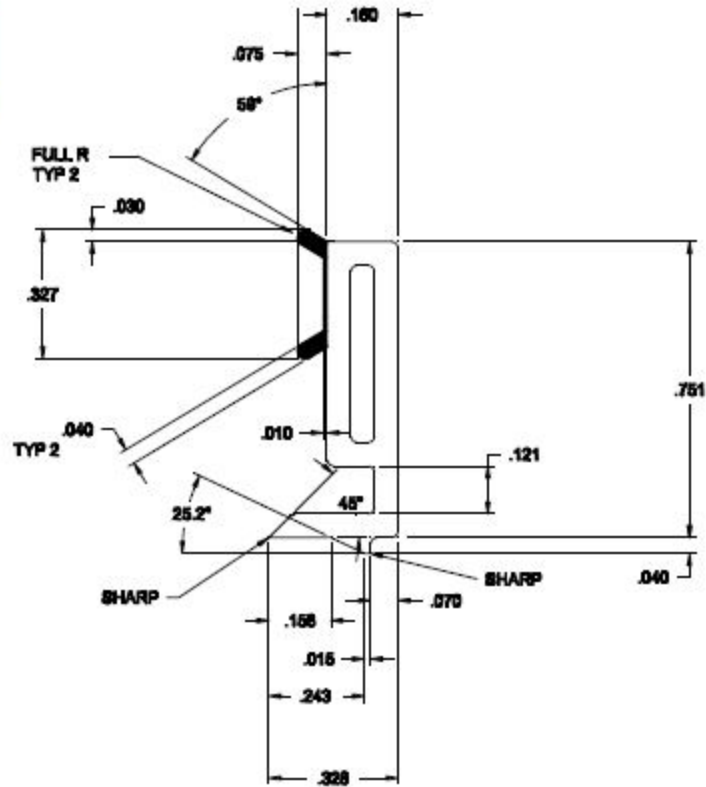
DWG NO B-SH-WF-1511



Report #: G1969-116-45

Date: 08/23/16

Verified by: *[Signature]*



AREA OF RIGID PVC=.106
WT/FT OF RIGID PVC=.088

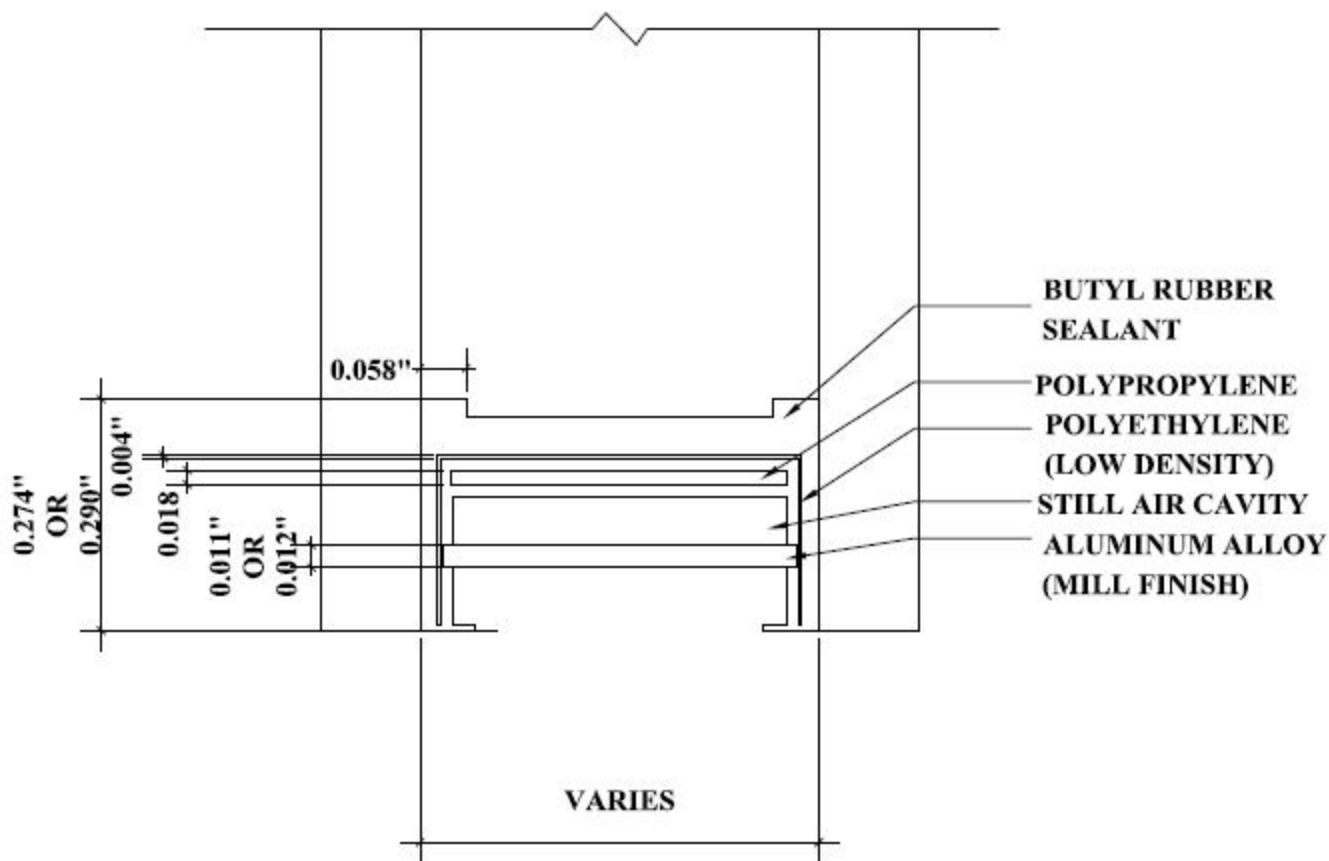
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WT/FT OF FLEX PVC= .005

TOTAL AREA=.113
TOTAL WT/FT=.093

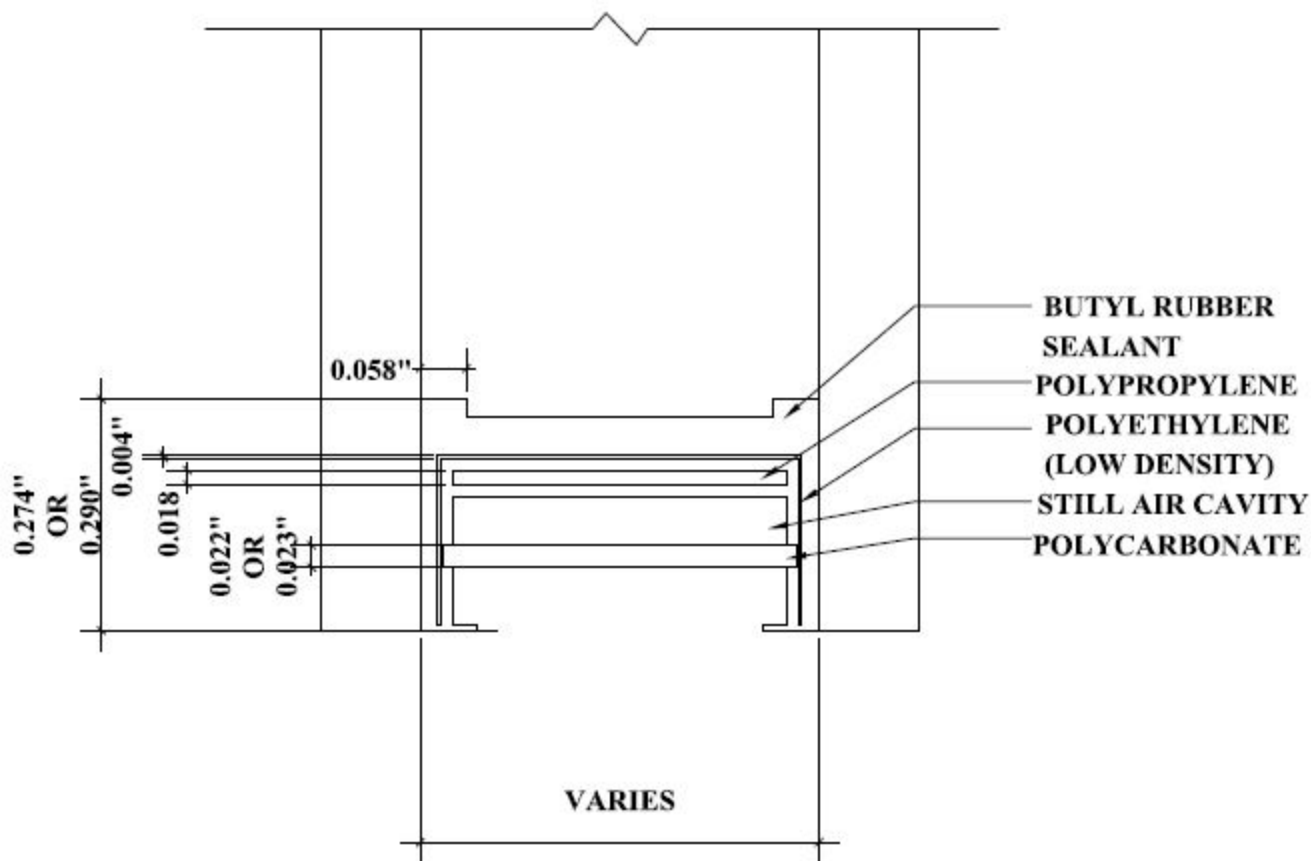
DO NOT SCALE DRAWING

NO.	REVISION	BY	DATE

<p>QUALITY LINEALS BY DDB DESIGNS "OUR NAME SAYS IT ALL"</p>	LOCATION FOR IMPACT TEST SPECIFICATION-LENGTHS TO 36"	ALLOWABLE BOW MAX. 1" PER 14" ANGULARITY TO BE ± 1/2°	TOLERANCES- XX ± .010 XXX ± .005
	1) MATERIAL RIGID PVC 2) CAPSTOCK 3) UNSPECIFIED WALLS .080 4) BREAK ALL CORNERS .016 R 5) AREA .113 SQ. IN. 6) WT/FT LBS./FT.	TITLE BUILDERS WINDOW GLAZING BEAD OWN BY DDB SCALE 4:1 DATE 1-8-98 CHG BY APPD BY COMPUTER NO DWG NO B-SHG-1008	

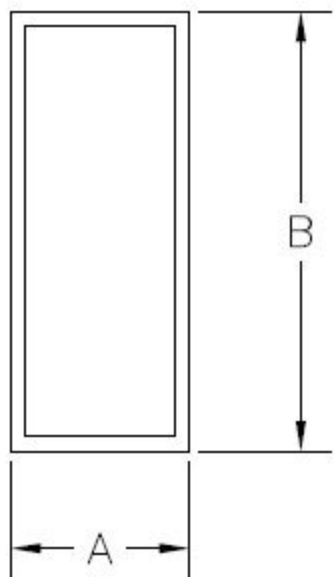


DETAIL FOR THERMAL MODELING OF
QUANEX DURASEAL SPACER (A8-S)




DETAIL FOR THERMAL MODELING OF
QUANEX DURALITE SPACER (PI-S)

INTERNAL MUNTIN



Material: PAINTED ALUMINUM
Width (A): 0.188"
Height (B): 0.625"
Wall Thickness: 0.020"

	Report #:	<u>G1969-116-45</u>
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