

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

(Revised)

**Rendered to:
NEON ENERGY**

**SERIES/MODEL:
Ultra Outswing Casement Window**

Report Number: I6723.01-301-45
Original Report Date: 08/05/18
Revised Report Date: 09/26/18

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COMPUTER SIMULATION REPORT**

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Rendered to:
NEON ENERGY
4989 East La Palma Ave.
Anaheim, California 92807

Report Number: I6723.01-301-45
Simulation Date: 08/05/18
Original Report Date: 08/05/18
Revised Report Date: 09/26/18

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 below.

**NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

Standards:

ANSI/NFRC 100-2017: Procedure for Determining Fenestration Product U-Factors
ANSI/NFRC 200-2017: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
NFRC 500-2017: Procedure for Determining Fenestration Product Condensation Resistance Values

Software:

Frame and Edge Modeling: THERM 7.4.4
Center-of-Glass Modeling: WINDOW 7.4.14
Total Product Calculations: WINDOW 7.4.14
Spectral Data Library: IGDB 62.0

Simulations Specimen Description:

Series/Model: Ultra Outswing Casement Window
Type: Casement, Single Vent
Frame Material: AT Aluminum w/ Thermal Breaks - All Members
Sash Material: AT Aluminum w/ Thermal Breaks - All Members
Standard Size: 600mm x 1500mm



Modeling Assumptions/Technical Interpretations:

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) 921, 922 and 923 frame profiles grouped per NFRC 100-2017, Section 4.2.1.H.ii.
923 frame profile is the group leader.
- 3) 903 and 913 sash profiles grouped per ANSI/NFRC 100-2017, Section 4.2.1.I.i. 913 sash profile is the group leader.

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 7.4.14. 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	0.021471	0.023185	0.024794
SHGC1	0.472907	0.422233	0.374679
VT0	0.000000	0.000000	0.000000
VT1	0.451436	0.399047	0.349884

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

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

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>
Ultra Outswing Casement Window	I6723.01-301-45
Ultra Outswing Door	G8893.02-301-45



Spacer Option Description

<i>Spacer Type</i>	<i>Sealant</i>		<i>Code</i>
	<i>Primary</i>	<i>Secondary</i>	
Aluminum Spacer	Butyl Rubber	Silicone	A1-D
Chromatech Ultra	Butyl Rubber	Polysulphide	TS-D
Saint-Gobain Swiss Spacer	Butyl Rubber	Silicone	TP-D

Grid Option Description

<i>Grid Size</i>	<i>Grid Type</i>	<i>Grid Pattern</i>
56mm x 43mm	TDL	NFRC Standard and Non-Standard

Reinforcement Option Description

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

Gas Filling Technique Description

<i>Fill Type</i>	<i>Method</i>
90% Argon	Dual Probe

Edge-of-Glass Construction

<i>Interior Condition</i>	EPDM gasket between the glass and the glazing bead.
<i>Exterior Condition</i>	EPDM gasket between the glass and the glazing stop.

Weatherstripping

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
EPDM gasket	2 Rows	All members of the frame.
EPDM gasket	1 Row	All members of the sash.

Frame/Sash Materials Finish

<i>Interior</i>	Aluminum - Painted
<i>Exterior</i>	Aluminum - Painted



NFRC 100/200/500 Summary Sheet

Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
1	SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.12					VT (N) 0.23		CR 53	
2	NFRC Default: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.10					VT (>1) 0.18		CR 47	
3	SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.14					VT (N) 0.28		CR 53	
4	NFRC Default: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.12					VT (>1) 0.22		CR 47	
5	ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.25					VT (N) 0.34		CR 53	
6	NFRC Default: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.20					VT (>1) 0.27		CR 47	
7	SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.12					VT (N) 0.18		CR 53	
8	NFRC Default: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.10					VT (>1) 0.14		CR 47	
9	SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.14					VT (N) 0.23		CR 53	
10	NFRC Default: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.11					VT (>1) 0.18		CR 47	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
11	SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.16					VT (N) 0.28		CR 53	
12	NFRC Default: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.13					VT (>1) 0.22		CR 47	
13	SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.18					VT (N) 0.31		CR 53	
14	NFRC Default: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.14					VT (>1) 0.24		CR 47	
15	ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	N
	U-Factor 0.49			SHGC (N) 0.26					VT (N) 0.31		CR 53	
16	NFRC Default: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.58			SHGC (>1) 0.21					VT (>1) 0.24		CR 46	
17	SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.14					VT (N) 0.28		CR 53	
18	NFRC Default: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.12					VT (>1) 0.22		CR 49	
19	ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.25					VT (N) 0.35		CR 53	
20	NFRC Default: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.20					VT (>1) 0.27		CR 49	



NFRC 100/200/500 Summary Sheet

Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
21	SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.12					VT (N) 0.18		CR 53	
22	NFRC Default: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.10					VT (>1) 0.14		CR 49	
23	SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.14					VT (N) 0.23		CR 53	
24	NFRC Default: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.11					VT (>1) 0.18		CR 49	
25	SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.16					VT (N) 0.28		CR 53	
26	NFRC Default: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.13					VT (>1) 0.22		CR 49	
27	SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.18					VT (N) 0.32		CR 53	
28	NFRC Default: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.15					VT (>1) 0.25		CR 49	
29	ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	N
	U-Factor 0.49			SHGC (N) 0.27					VT (N) 0.31		CR 53	
30	NFRC Default: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.58			SHGC (>1) 0.22					VT (>1) 0.24		CR 48	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
31	ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	N
	U-Factor 0.49			SHGC (N) 0.26					VT (N) 0.31		CR 52	
32	NFRC Default: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
33	ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	N
	U-Factor 0.50			SHGC (N) 0.26					VT (N) 0.31		CR 51	
34	NFRC Default: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.60			SHGC (>1) 0.21					VT (>1) 0.24		CR 44	
35	SNX 6227 / Arg / SNX 6227 / Arg / Clr - 36mm(4mm-4mm-4mm)											
	0.151	0.470	0.151	0.470	0.154			ARG90	0.020(#2) / 0.020(#4)	CL	TS-D	N
	U-Factor 0.38			SHGC (N) 0.11					VT (N) 0.20		CR 55	
36	SNX 6227 / Arg / SNX 6227 / Arg / Clr - 41mm(6mm-6mm-5mm)											
	0.221	0.470	0.221	0.470	0.185			ARG90	0.020(#2) / 0.020(#4)	CL	TS-D	N
	U-Factor 0.38			SHGC (N) 0.11					VT (N) 0.19		CR 55	
37	SNX 5123 / Arg / SNX 5123/ Arg / Clr - 41mm(6mm-6mm-5mm)											
	0.221	0.470	0.221	0.470	0.185			ARG90	0.021(#2) / 0.021(#4)	CL	TS-D	N
	U-Factor 0.38			SHGC (N) 0.09					VT (N) 0.13		CR 55	
38	SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	N
	U-Factor 0.43			SHGC (N) 0.12					VT (N) 0.22		CR 52	
39	NFRC Default: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.50			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
40	1 Horizontal TDL: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.10					VT (>1) 0.18		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
41	1 Horizontal TDL: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
42	1 Horizontal TDL: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	
43	1 Horizontal TDL: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	
44	1 Horizontal TDL: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	
45	1 Horizontal TDL: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	
46	1 Horizontal TDL: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.14					VT (>1) 0.24		CR 53	
47	1 Horizontal TDL: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.21					VT (>1) 0.24		CR 53	
48	1 Horizontal TDL: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
49	1 Horizontal TDL: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	
50	1 Horizontal TDL: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
51	1 Horizontal TDL: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	
52	1 Horizontal TDL: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.49			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	
53	1 Horizontal TDL: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.48			SHGC (>1) 0.15					VT (>1) 0.25		CR 53	
54	1 Horizontal TDL: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.22					VT (>1) 0.24		CR 53	
55	1 Horizontal TDL: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
56	1 Horizontal TDL: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.21					VT (>1) 0.24		CR 51	
57	1 Horizontal TDL: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.44			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
58	2 Horizontal TDLs: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.10					VT (>1) 0.18		CR 53	
59	2 Horizontal TDLs: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
60	2 Horizontal TDLs: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
61	2 Horizontal TDLs: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	
62	2 Horizontal TDLs: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	
63	2 Horizontal TDLs: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	
64	2 Horizontal TDLs: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.14					VT (>1) 0.24		CR 53	
65	2 Horizontal TDLs: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.21					VT (>1) 0.24		CR 53	
66	2 Horizontal TDLs: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
67	2 Horizontal TDLs: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	
68	2 Horizontal TDLs: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	
69	2 Horizontal TDLs: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	
70	2 Horizontal TDLs: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
71	2 Horizontal TDLS: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.15					VT (>1) 0.25		CR 53	
72	2 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.22					VT (>1) 0.24		CR 53	
73	2 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
74	2 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.21					VT (>1) 0.24		CR 51	
75	2 Horizontal TDLS: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.45			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
76	3 Horizontal TDLS: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.10					VT (>1) 0.18		CR 53	
77	3 Horizontal TDLS: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
78	3 Horizontal TDLS: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	
79	3 Horizontal TDLS: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	
80	3 Horizontal TDLS: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
81	3 Horizontal TDLS: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	
82	3 Horizontal TDLS: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.14					VT (>1) 0.24		CR 53	
83	3 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
84	3 Horizontal TDLS: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.12					VT (>1) 0.22		CR 53	
85	3 Horizontal TDLS: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.20					VT (>1) 0.27		CR 53	
86	3 Horizontal TDLS: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.10					VT (>1) 0.14		CR 53	
87	3 Horizontal TDLS: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.11					VT (>1) 0.18		CR 53	
88	3 Horizontal TDLS: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.13					VT (>1) 0.22		CR 53	
89	3 Horizontal TDLS: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.15					VT (>1) 0.25		CR 53	
90	3 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.22					VT (>1) 0.24		CR 53	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
91	3 Horizontal TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
92	3 Horizontal TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.54			SHGC (>1) 0.21					VT (>1) 0.24		CR 51	
93	3 Horizontal TDLs: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.46			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
94	4 Horizontal TDLs: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.18		CR 51	
95	4 Horizontal TDLs: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.12					VT (>1) 0.22		CR 51	
96	4 Horizontal TDLs: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.20					VT (>1) 0.27		CR 51	
97	4 Horizontal TDLs: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.14		CR 51	
98	4 Horizontal TDLs: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.11					VT (>1) 0.18		CR 51	
99	4 Horizontal TDLs: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.13					VT (>1) 0.22		CR 51	
100	4 Horizontal TDLs: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.14					VT (>1) 0.24		CR 51	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
101	4 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.55			SHGC (>1) 0.21					VT (>1) 0.24		CR 49	
102	4 Horizontal TDLS: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.12					VT (>1) 0.22		CR 52	
103	4 Horizontal TDLS: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.20					VT (>1) 0.27		CR 52	
104	4 Horizontal TDLS: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.14		CR 52	
105	4 Horizontal TDLS: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.11					VT (>1) 0.18		CR 52	
106	4 Horizontal TDLS: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.13					VT (>1) 0.22		CR 52	
107	4 Horizontal TDLS: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.15					VT (>1) 0.25		CR 52	
108	4 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.54			SHGC (>1) 0.22					VT (>1) 0.24		CR 51	
109	4 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.51			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
110	4 Horizontal TDLS: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.56			SHGC (>1) 0.21					VT (>1) 0.24		CR 48	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
111	4 Horizontal TDLs: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)		CL	TS-D T
	U-Factor 0.47			SHGC (>1) 0.10					VT (>1) 0.17		CR	52
112	1 Vertical TDL: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.18		CR	50
113	1 Vertical TDL: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.12					VT (>1) 0.22		CR	50
114	1 Vertical TDL: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.20					VT (>1) 0.27		CR	50
115	1 Vertical TDL: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.14		CR	50
116	1 Vertical TDL: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.11					VT (>1) 0.18		CR	50
117	1 Vertical TDL: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.13					VT (>1) 0.22		CR	50
118	1 Vertical TDL: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)		CL	A1-D T
	U-Factor 0.53			SHGC (>1) 0.14					VT (>1) 0.24		CR	50
119	1 Vertical TDL: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)		CL	A1-D T
	U-Factor 0.54			SHGC (>1) 0.21					VT (>1) 0.24		CR	48
120	1 Vertical TDL: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)		CL	A1-D T
	U-Factor 0.52			SHGC (>1) 0.12					VT (>1) 0.22		CR	51



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
121	1 Vertical TDL: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.20					VT (>1) 0.27		CR 51	
122	1 Vertical TDL: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.10					VT (>1) 0.14		CR 51	
123	1 Vertical TDL: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.11					VT (>1) 0.18		CR 51	
124	1 Vertical TDL: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.53			SHGC (>1) 0.13					VT (>1) 0.22		CR 51	
125	1 Vertical TDL: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.52			SHGC (>1) 0.15					VT (>1) 0.25		CR 51	
126	1 Vertical TDL: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.54			SHGC (>1) 0.22					VT (>1) 0.24		CR 50	
127	1 Vertical TDL: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.50			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
128	1 Vertical TDL: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.56			SHGC (>1) 0.21					VT (>1) 0.24		CR 47	
129	1 Vertical TDL: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.46			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
130	2 Vertical TDLs: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.10					VT (>1) 0.18		CR 48	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
131	2 Vertical TDLs: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.12					VT (>1) 0.22		CR 48	
132	2 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.20					VT (>1) 0.27		CR 48	
133	2 Vertical TDLs: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.10					VT (>1) 0.14		CR 48	
134	2 Vertical TDLs: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.11					VT (>1) 0.18		CR 48	
135	2 Vertical TDLs: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.13					VT (>1) 0.22		CR 48	
136	2 Vertical TDLs: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.14					VT (>1) 0.24		CR 48	
137	2 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.65			SHGC (>1) 0.21					VT (>1) 0.24		CR 47	
138	2 Vertical TDLs: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.62			SHGC (>1) 0.12					VT (>1) 0.22		CR 50	
139	2 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.20					VT (>1) 0.27		CR 49	
140	2 Vertical TDLs: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.10					VT (>1) 0.14		CR 50	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
141	2 Vertical TDLs: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.62			SHGC (>1) 0.11					VT (>1) 0.18		CR 50	
142	2 Vertical TDLs: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.63			SHGC (>1) 0.13					VT (>1) 0.22		CR 50	
143	2 Vertical TDLs: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.62			SHGC (>1) 0.15					VT (>1) 0.25		CR 50	
144	2 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.65			SHGC (>1) 0.22					VT (>1) 0.24		CR 48	
145	2 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.57			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
146	2 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.67			SHGC (>1) 0.21					VT (>1) 0.24		CR 45	
147	2 Vertical TDLs: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.54			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
148	3 Vertical TDLs: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.75			SHGC (>1) 0.10					VT (>1) 0.18		CR 48	
149	3 Vertical TDLs: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.75			SHGC (>1) 0.12					VT (>1) 0.22		CR 48	
150	3 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.20					VT (>1) 0.27		CR 48	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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	
151	3 Vertical TDLs: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.10					VT (>1) 0.14		CR 48	
152	3 Vertical TDLs: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.11					VT (>1) 0.18		CR 48	
153	3 Vertical TDLs: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.13					VT (>1) 0.22		CR 48	
154	3 Vertical TDLs: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.14					VT (>1) 0.24		CR 48	
155	3 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.77			SHGC (>1) 0.21					VT (>1) 0.24		CR 47	
156	3 Vertical TDLs: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.73			SHGC (>1) 0.12					VT (>1) 0.22		CR 50	
157	3 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.74			SHGC (>1) 0.20					VT (>1) 0.27		CR 49	
158	3 Vertical TDLs: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.73			SHGC (>1) 0.10					VT (>1) 0.14		CR 50	
159	3 Vertical TDLs: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.73			SHGC (>1) 0.11					VT (>1) 0.18		CR 50	
160	3 Vertical TDLs: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.73			SHGC (>1) 0.13					VT (>1) 0.22		CR 50	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
161	3 Vertical TDLs: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.73			SHGC (>1) 0.15					VT (>1) 0.25		CR 50	
162	3 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.76			SHGC (>1) 0.22					VT (>1) 0.24		CR 48	
163	3 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.64			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
164	3 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.79			SHGC (>1) 0.21					VT (>1) 0.24		CR 45	
165	3 Vertical TDLs: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.62			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
166	4 Vertical TDLs: SNX 5123 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.021(#2)	CL	A1-D	T
	U-Factor 0.86			SHGC (>1) 0.10					VT (>1) 0.18		CR 48	
167	4 Vertical TDLs: SNX 6227 / Arg / Clr - 28mm(6mm-6mm)											
	0.221	0.630	0.224					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.86			SHGC (>1) 0.12					VT (>1) 0.22		CR 48	
168	4 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.86			SHGC (>1) 0.20					VT (>1) 0.27		CR 48	
169	4 Vertical TDLs: SN 4023 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.85			SHGC (>1) 0.10					VT (>1) 0.14		CR 48	
170	4 Vertical TDLs: SN 5128 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.85			SHGC (>1) 0.11					VT (>1) 0.18		CR 48	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
171	4 Vertical TDLs: SN 6234 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.85			SHGC (>1) 0.13					VT (>1) 0.22		CR 48	
172	4 Vertical TDLs: SN 7037 / Arg / Clr - 27mm(6mm-5mm)											
	0.230	0.630	0.185					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.85			SHGC (>1) 0.14					VT (>1) 0.24		CR 48	
173	4 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 27mm(6mm-5mm)											
	0.226	0.630	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.89			SHGC (>1) 0.21					VT (>1) 0.24		CR 47	
174	4 Vertical TDLs: SNX 6227 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.020(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.12					VT (>1) 0.22		CR 50	
175	4 Vertical TDLs: ClimaGuard Premium T / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.035(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.20					VT (>1) 0.27		CR 49	
176	4 Vertical TDLs: SN 4023 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.10					VT (>1) 0.14		CR 50	
177	4 Vertical TDLs: SN 5128 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.025(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.11					VT (>1) 0.18		CR 50	
178	4 Vertical TDLs: SN 6234 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.13					VT (>1) 0.22		CR 50	
179	4 Vertical TDLs: SN 7037 / Arg / Clr - 24mm(4mm-4mm)											
	0.151	0.630	0.154					ARG90	0.022(#2)	CL	A1-D	T
	U-Factor 0.84			SHGC (>1) 0.15					VT (>1) 0.25		CR 50	
180	4 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 24mm(4mm-4mm)											
	0.148	0.630	0.154					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.87			SHGC (>1) 0.22					VT (>1) 0.24		CR 48	



NFRC 100/200/500 Summary Sheet

Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
181	4 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(6mm-5mm)											
	0.226	0.670	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.71			SHGC (>1) 0.21					VT (>1) 0.24		CR 52	
182	4 Vertical TDLs: ClimaGuard Neutral 70 / Arg / Clr - 28mm(4mm-4mm)											
	0.226	0.787	0.185					ARG90	0.171(#2)	CL	A1-D	T
	U-Factor 0.91			SHGC (>1) 0.21					VT (>1) 0.24		CR 45	
183	4 Vertical TDLs: SNX 5123 / Arg / 3mmClr-030PVB-3mmIS20 - 28mm (6mm-6mm)											
	0.221	0.625	0.264					ARG90	0.021(#2) / 0.198(#4)	CL	TS-D	T
	U-Factor 0.70			SHGC (>1) 0.10					VT (>1) 0.17		CR 52	
184	SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	N
	U-Factor 0.42			SHGC (N) 0.13					VT (N) 0.22		CR 50	
185	SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.49			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
186	1 Horizontal TDL: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.43			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
187	2 Horizontal TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.44			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
188	3 Horizontal TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.45			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
189	4 Horizontal TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
190	1 Vertical TDL: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
191	2 Vertical TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)		CL	TP-D T
	U-Factor 0.53			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
192	3 Vertical TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)		CL	TP-D T
	U-Factor 0.60			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
193	4 Vertical TDLs: SN 5128 / Arg / Climaguard Dry - 27mm(6mm-6mm)											
	0.230	0.590	0.230					ARG90	0.025(#2) / 0.200(#4)		CL	TP-D T
	U-Factor 0.68			SHGC (>1) 0.11					VT (>1) 0.17		CR 50	
194	SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D N
	U-Factor 0.42			SHGC (N) 0.13					VT (N) 0.22		CR 52	
195	SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.48			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
196	1 Horizontal TDL: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.43			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
197	2 Horizontal TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.44			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
198	3 Horizontal TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.45			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
199	4 Horizontal TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.46			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
200	1 Vertical TDL: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.45			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	



NFRC 100/200/500 Summary Sheet

Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
201	2 Vertical TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.52			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
202	3 Vertical TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.60			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
203	4 Vertical TDLs: SN 5128 / Arg / IS20 - 27mm(6mm-6mm)											
	0.230	0.590	0.221					ARG90	0.025(#2) / 0.198(#4)		CL	TP-D T
	U-Factor 0.67			SHGC (>1) 0.11					VT (>1) 0.17		CR 52	
204	4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D N
	U-Factor 0.45			SHGC (N) 0.17					VT (N) 0.31		CR 52	
205	4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.54			SHGC (>1) 0.14					VT (>1) 0.24		CR 50	
206	1 Horizontal TDL: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.46			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
207	2 Horizontal TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.48			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
208	3 Horizontal TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.49			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
209	4 Horizontal TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.50			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
210	1 Vertical TDL: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)		CL	A1-D T
	U-Factor 0.50			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	



NFRC 100/200/500 Summary Sheet

Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
				Grids (None / <1 / >=1)					Grids (None / <1 / >=1)			
211	2 Vertical TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.59			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
212	3 Vertical TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.70			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
213	4 Vertical TDLs: 4mm-076PVB-4mmPlanistar / Arg / 3mmClr-076PVB-3mmClr - 28mm(8mm-6mm)											
	0.384	0.391	0.311					ARG90	0.026(#2)	CL	A1-D	T
	U-Factor 0.80			SHGC (>1) 0.14					VT (>1) 0.24		CR 52	
214	SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	N
	U-Factor 0.44			SHGC (N) 0.14					VT (N) 0.23		CR 56	
215	SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.49			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
216	1 Horizontal TDL: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.45			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
217	2 Horizontal TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.45			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
218	3 Horizontal TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
219	4 Horizontal TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.47			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
220	1 Vertical TDL: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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)					Visible Transmittance (VT)		Condensation Resistance	
	Grids (None / <1 / >=1)					Grids (None / <1 / >=1)						
221	2 Vertical TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.54			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
222	3 Vertical TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.61			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
223	4 Vertical TDLs: SN 5128 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.025(#2)	CL	TP-D	T
	U-Factor 0.69			SHGC (>1) 0.11					VT (>1) 0.17		CR 56	
224	SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	N
	U-Factor 0.44			SHGC (N) 0.18					VT (N) 0.31		CR 56	
225	SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.49			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	
226	1 Horizontal TDL: SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.45			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	
227	2 Horizontal TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.45			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	
228	3 Horizontal TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	
229	4 Horizontal TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.47			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	
230	1 Vertical TDL: SN 7037 / Arg / Clr - 28mm(6mm-6mm)											
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T
	U-Factor 0.46			SHGC (>1) 0.14					VT (>1) 0.24		CR 56	



NFRC 100/200/500 Summary Sheet Ultra Outswing Casement 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		
231	2 Vertical TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)												
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T	
	U-Factor		0.53	SHGC (>1)					0.14	VT (>1)		0.24	CR
232	3 Vertical TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)												
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T	
	U-Factor		0.61	SHGC (>1)					0.14	VT (>1)		0.24	CR
233	4 Vertical TDLs: SN 7037 / Arg / Clr - 28mm(6mm-6mm)												
	0.230	0.630	0.224					ARG90	0.022(#2)	CL	TP-D	T	
	U-Factor		0.69	SHGC (>1)					0.14	VT (>1)		0.24	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 5, 2023.

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:

REVIEWED BY:

David L. Everitt
Simulation Technician

Kenny C. White
Laboratory Manager
Simulator-In-Responsible-Charge

DLE:dle

I6723.01-301-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (33)



Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.01R0	08/05/18	All	Original Report Issue. Work Requested by Tzouma Amrou of Neon Energy.
.01R1	08/21/18	All	Options #214-233 added to the report.
.01R2	08/27/18	All	Series/Model name updated.
.01R3	08/30/18	All	Options #204-213 updated and recalculated.
.01R4	09/05/18	All	Options #204-213 updated from 25mm overall to 28mm.
.01R5	09/17/18	All	TDL option for options #204-233 updated. Options #204-233 recalculated.
.01R6	09/26/18	All	TDL option for options #204-213 updated. Options #204-213 recalculated.



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

Appendix A

I6723.01-301-45



Company Name: Neon Energy

Series/Model: Outswing Casement

Part #	Part Description	Material	Finish
TVO 913 a	-	Aluminum	Painted
TVO 913 b	-	Aluminum	Painted
TVO 903 a	-	Aluminum	Painted
TVO 903 b	-	Aluminum	Painted
TVO 921 a	-	Aluminum	Painted
TVO 921 b	-	Aluminum	Painted
TVO 922 a	-	Aluminum	Painted
TVO 922 b	-	Aluminum	Painted
TVO 923 a	-	Aluminum	Painted
TVO 923 b	-	Aluminum	Painted
VO 41	-	Aluminum	Painted
-	Triple Glazed Bead	Aluminum	Painted
-	Sash TB #1	Polyamide	-
-	Sash TB #2	Polyamide	-
-	Frame TB	Polyamide	-
AVO-1	-	EPDM	-
AVO-2	-	EPDM	-
P3	-	EPDM	-
AVO-3	-	EPDM	-
-	TDL Part #1	Aluminum	Painted
-	TDL Part #2	Aluminum	Painted
-	TDL Part #3	Aluminum	Painted

HORIZONTAL SECTION A-A' & VERTICAL SECTION BB'

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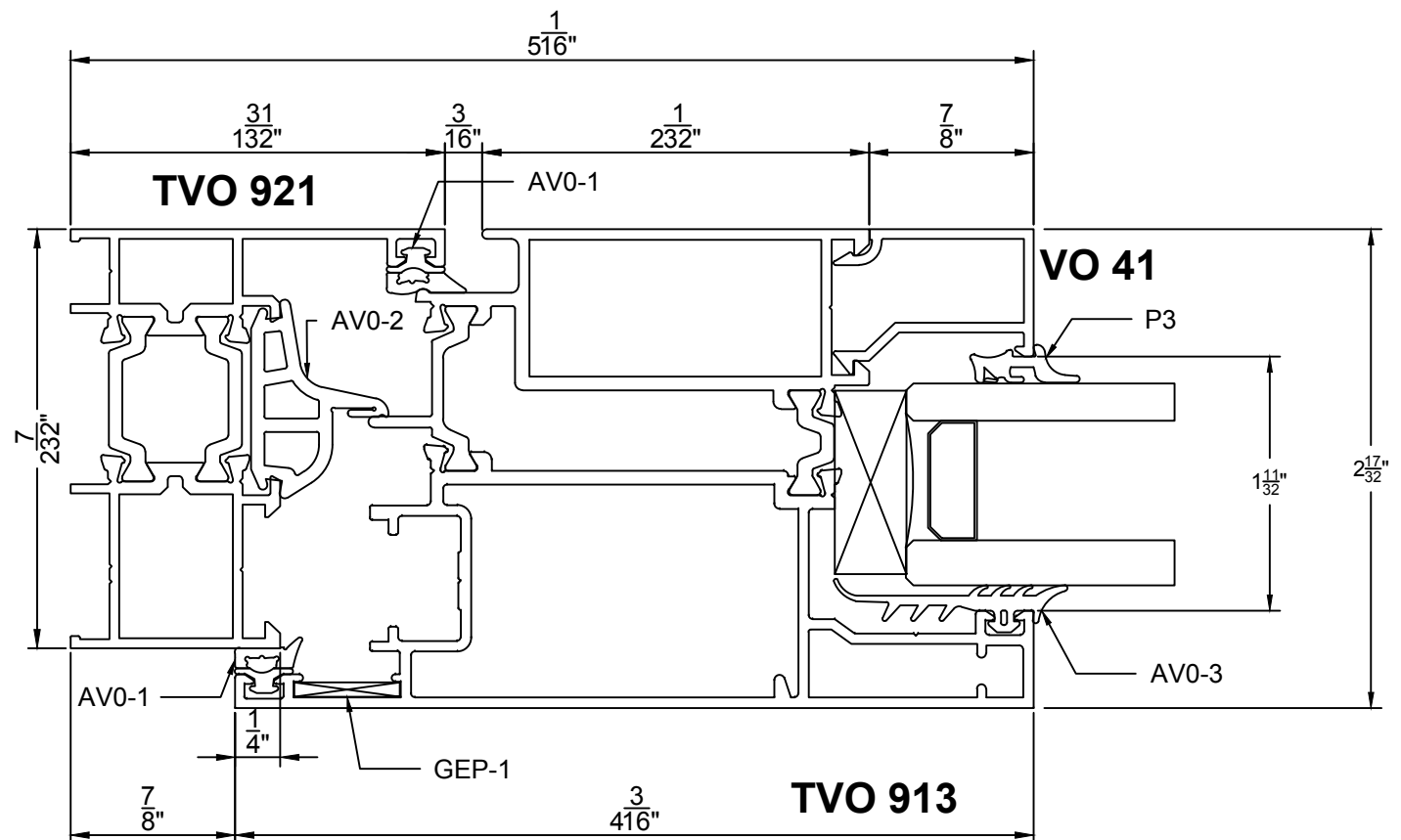
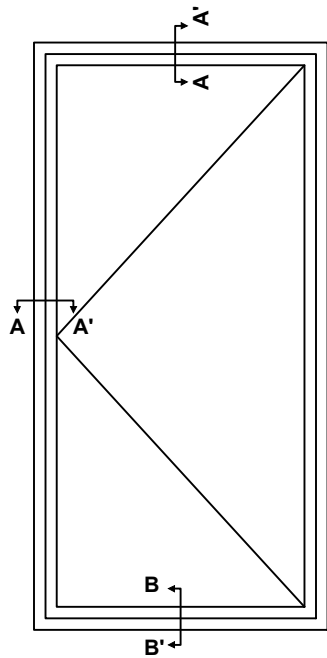
intertek
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Report #: I6723.01-301-45

Date: 08/05/18

Verified by:

DeJ Smith
REGISTERED PROFESSIONAL MECHANICAL ENGINEER



HORIZONTAL SECTION A-A' & VERTICAL SECTION BB'

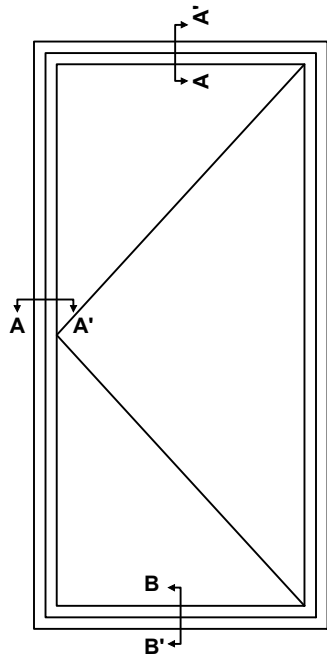
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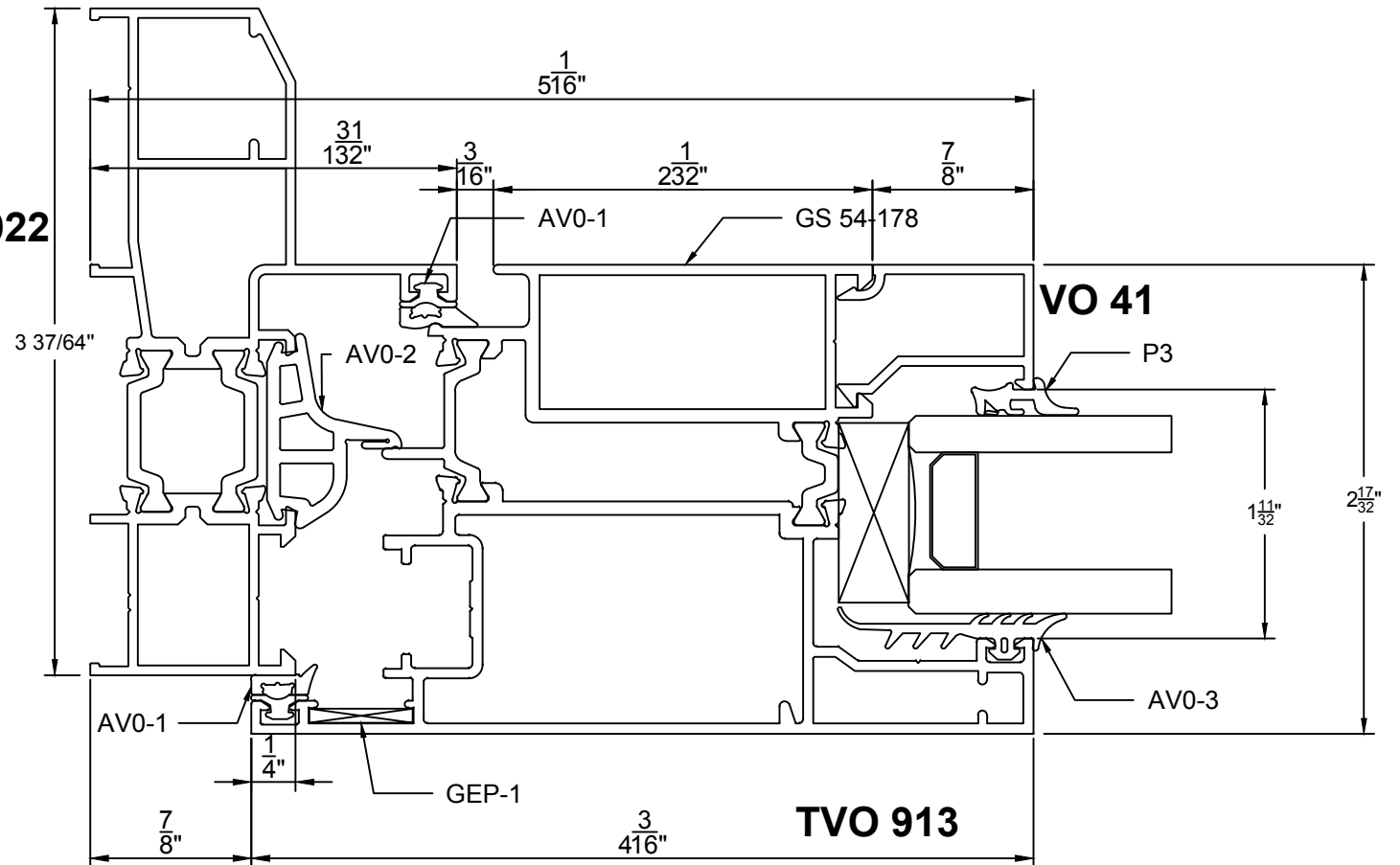
Report #: I6723.01-301-45

Date: 08/05/18

Verified by: *DJE*



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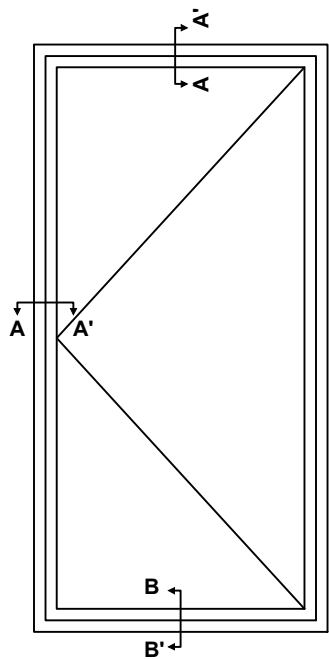


VO 41

TVO 913

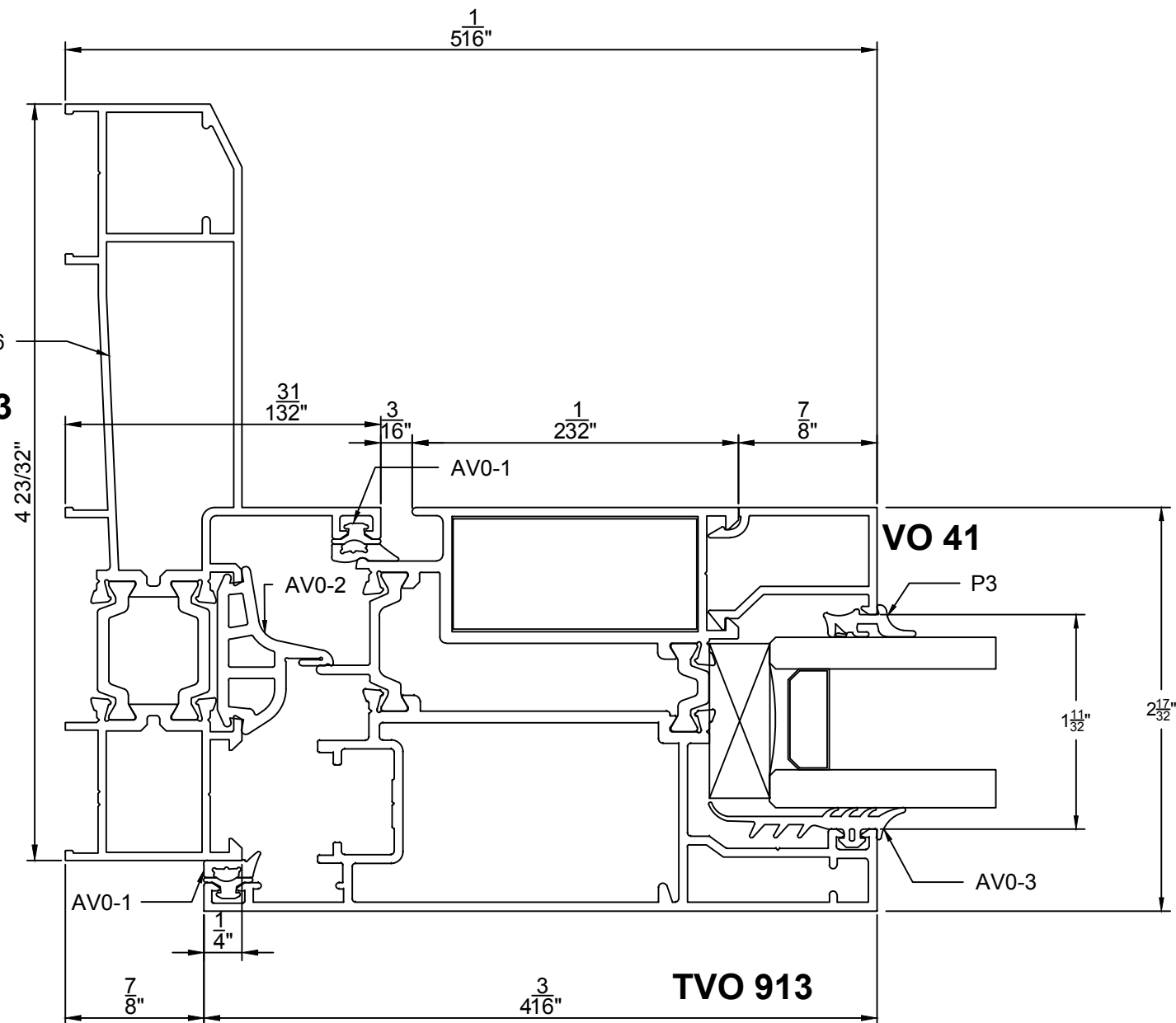
HORIZONTAL SECTION A-A' & VERTICAL SECTION BB'

Scale. 1:1



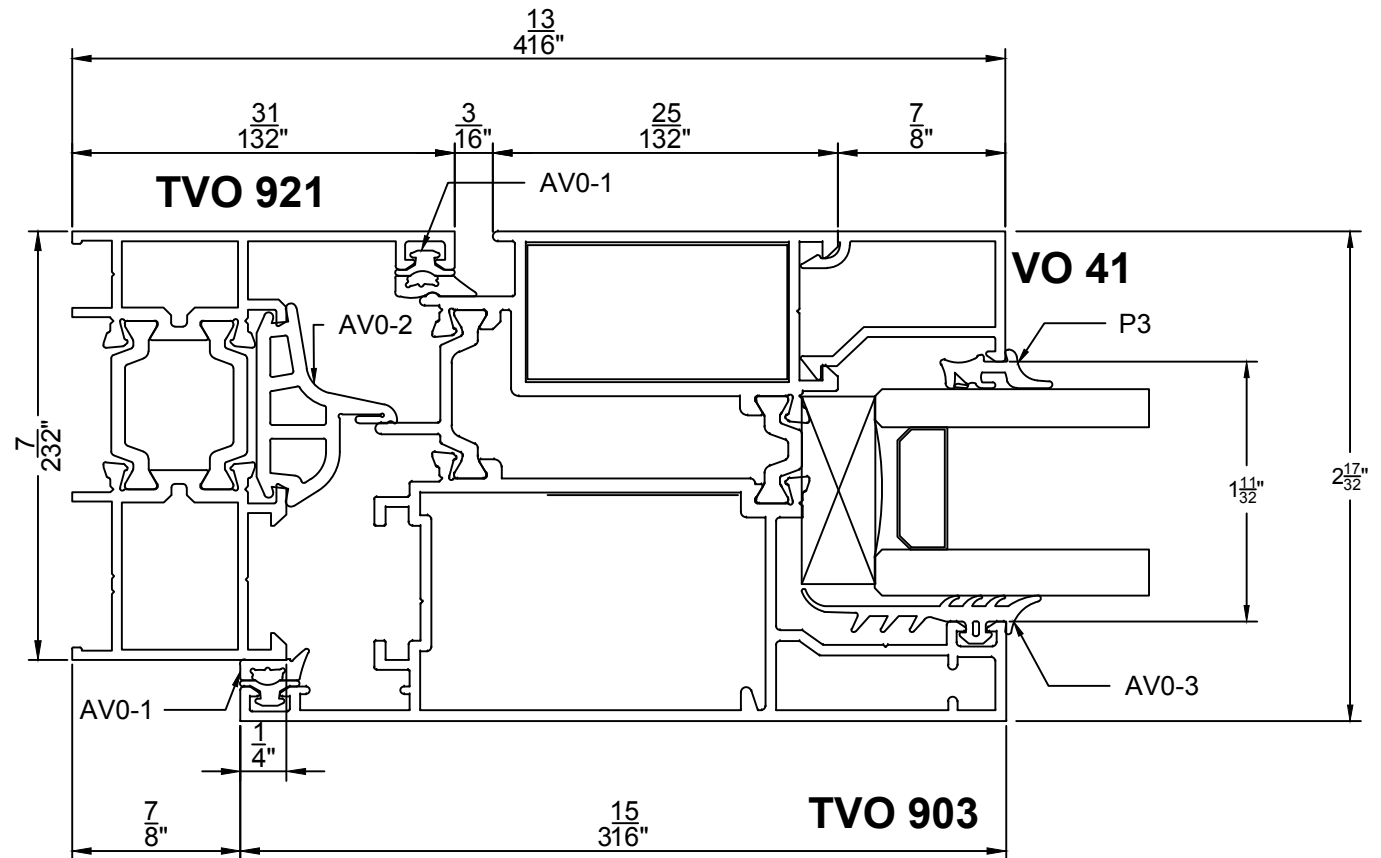
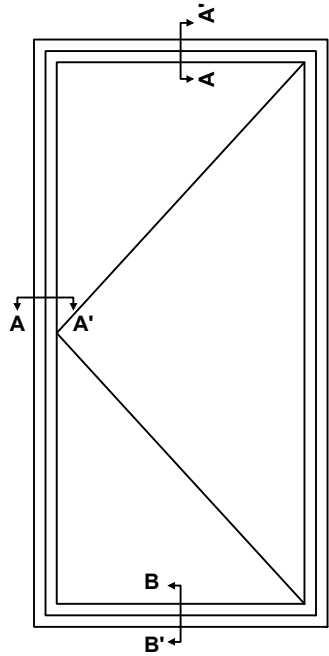
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GS 56-186



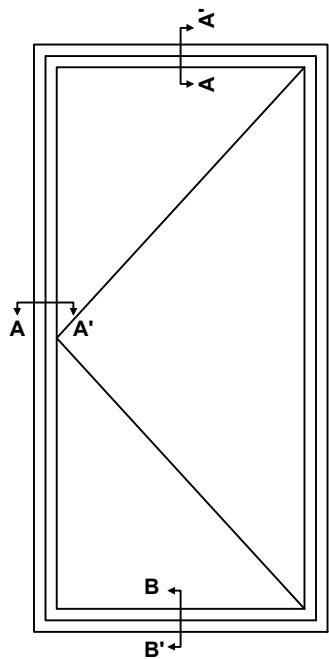
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Scale. 1:1

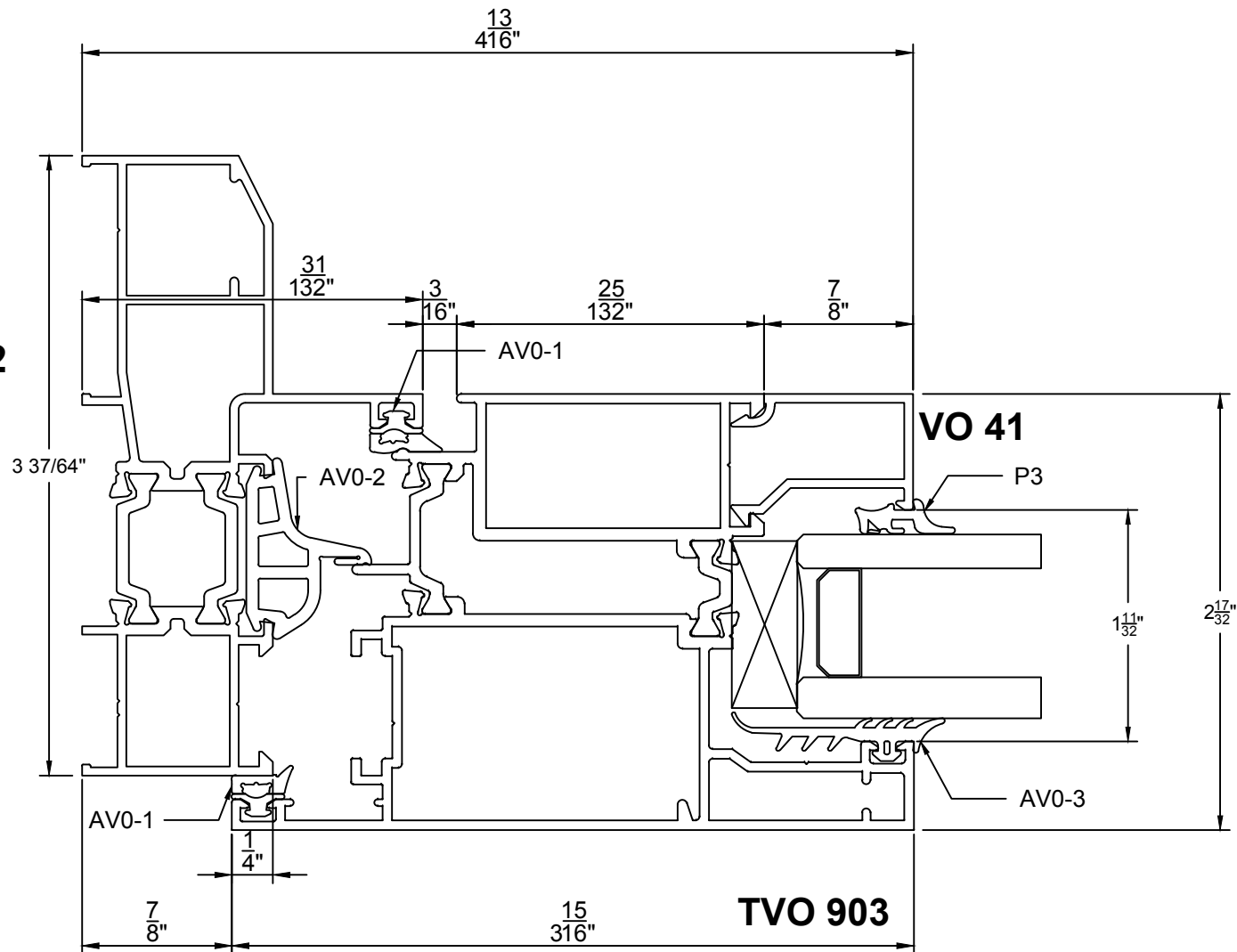


HORIZONTAL SECTION A-A' & VERTICAL SECTION BB'

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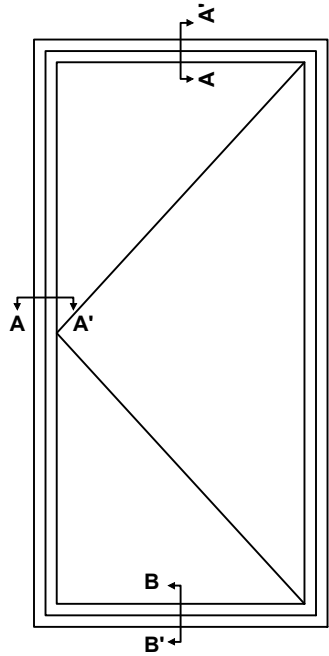


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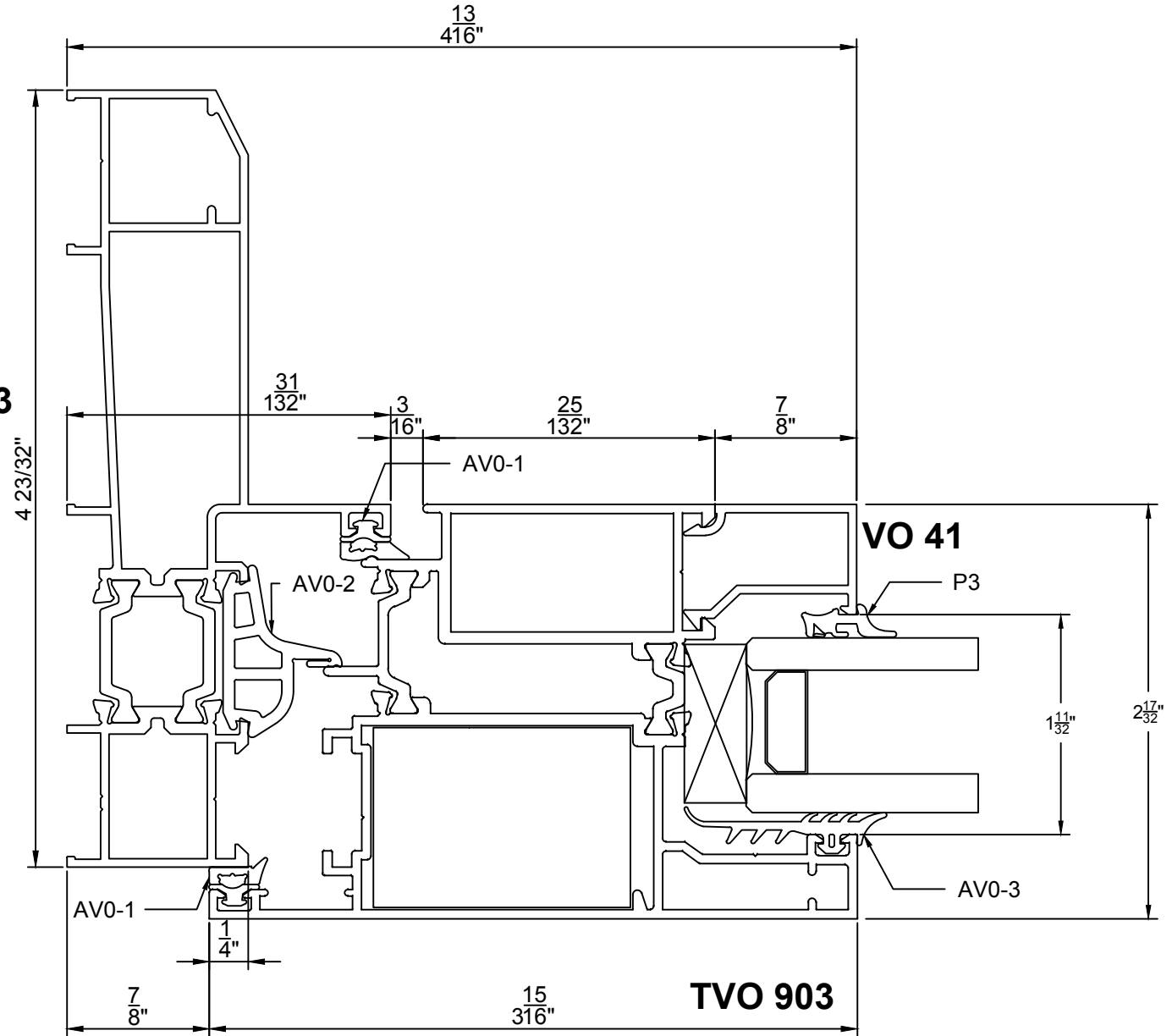


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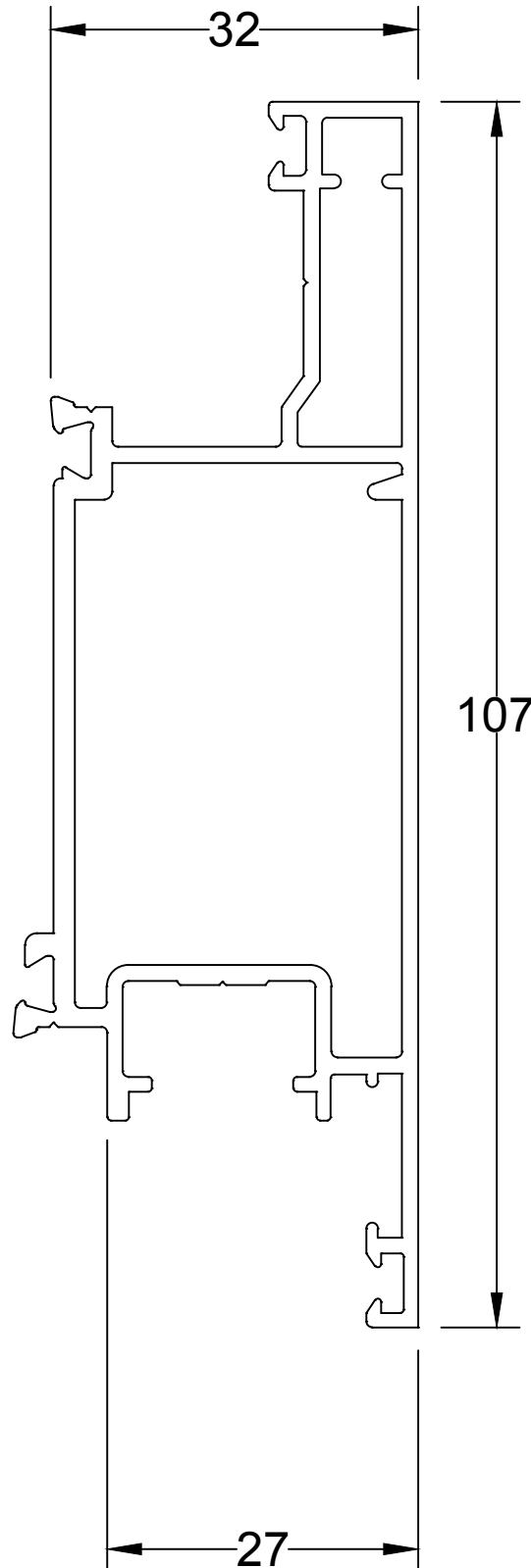
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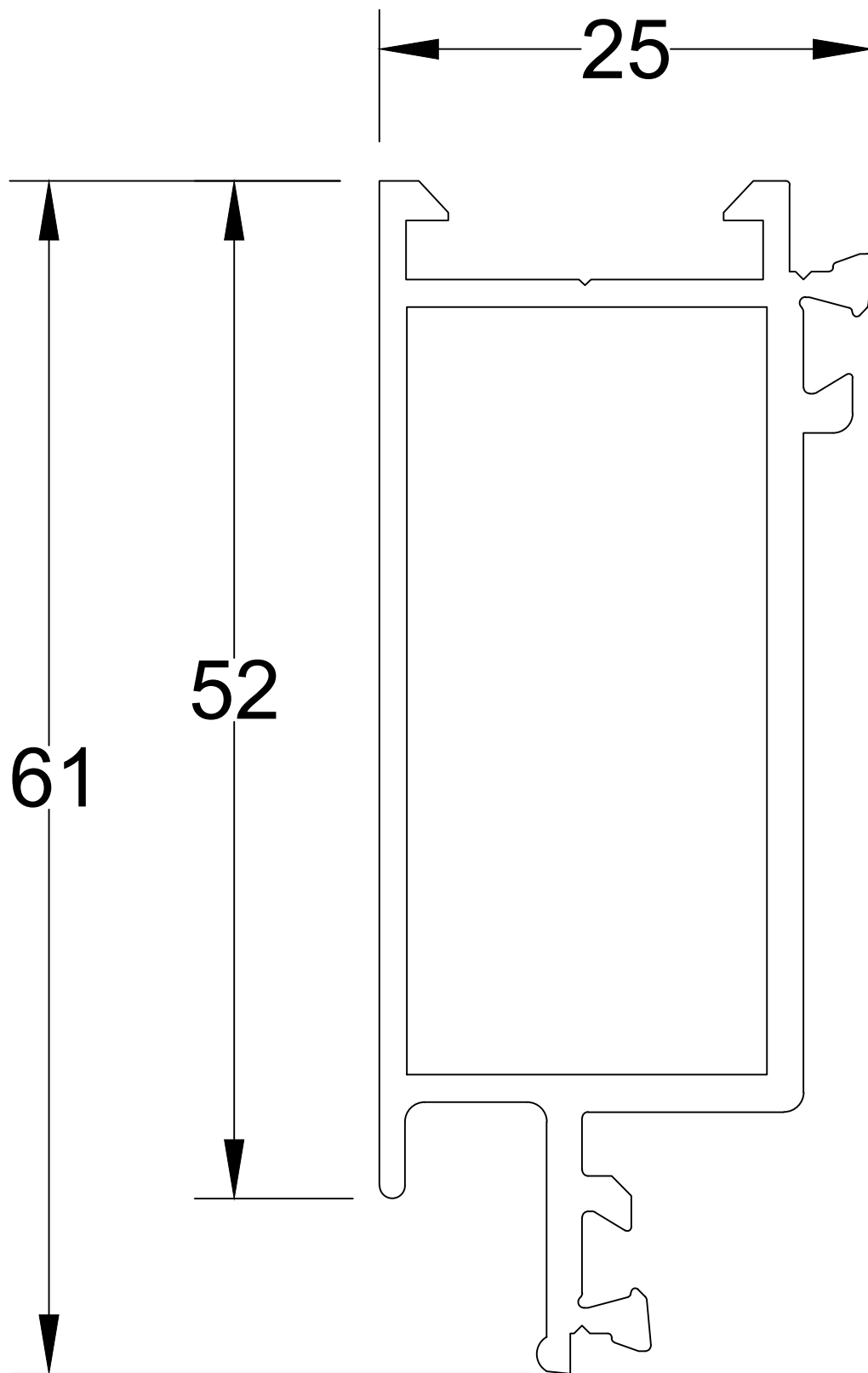


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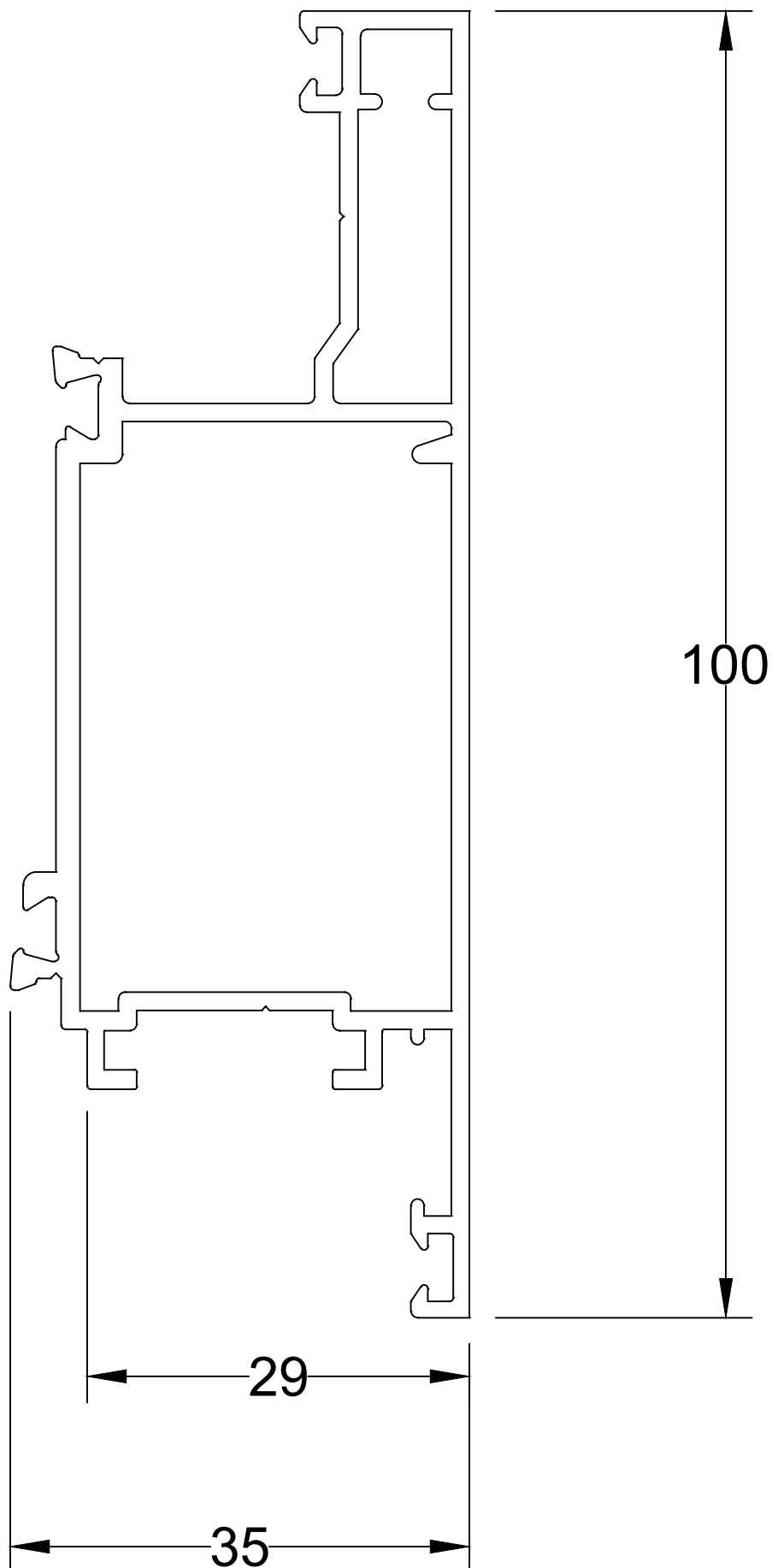


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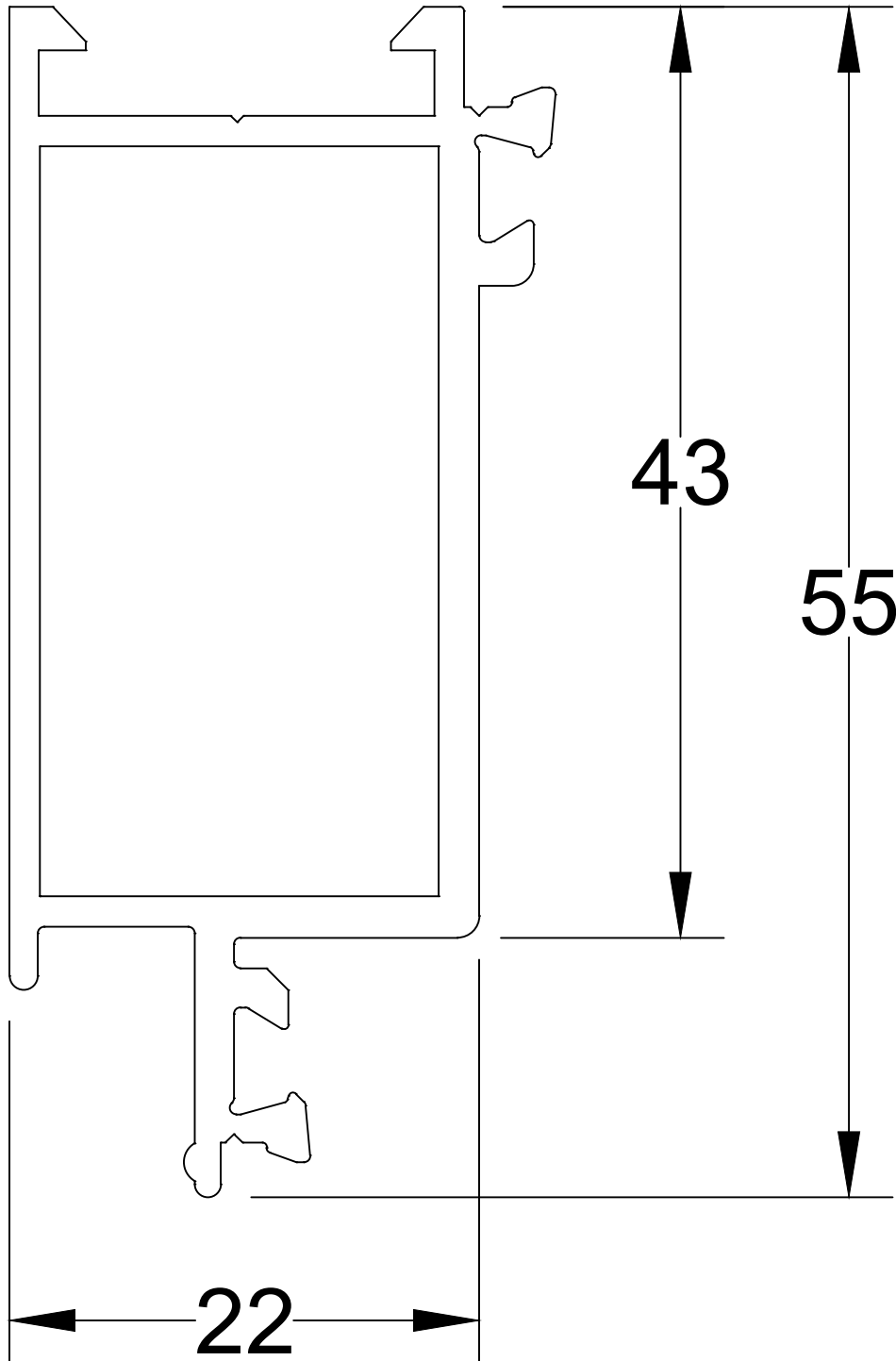
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TVO 903 a



TVO 903 b



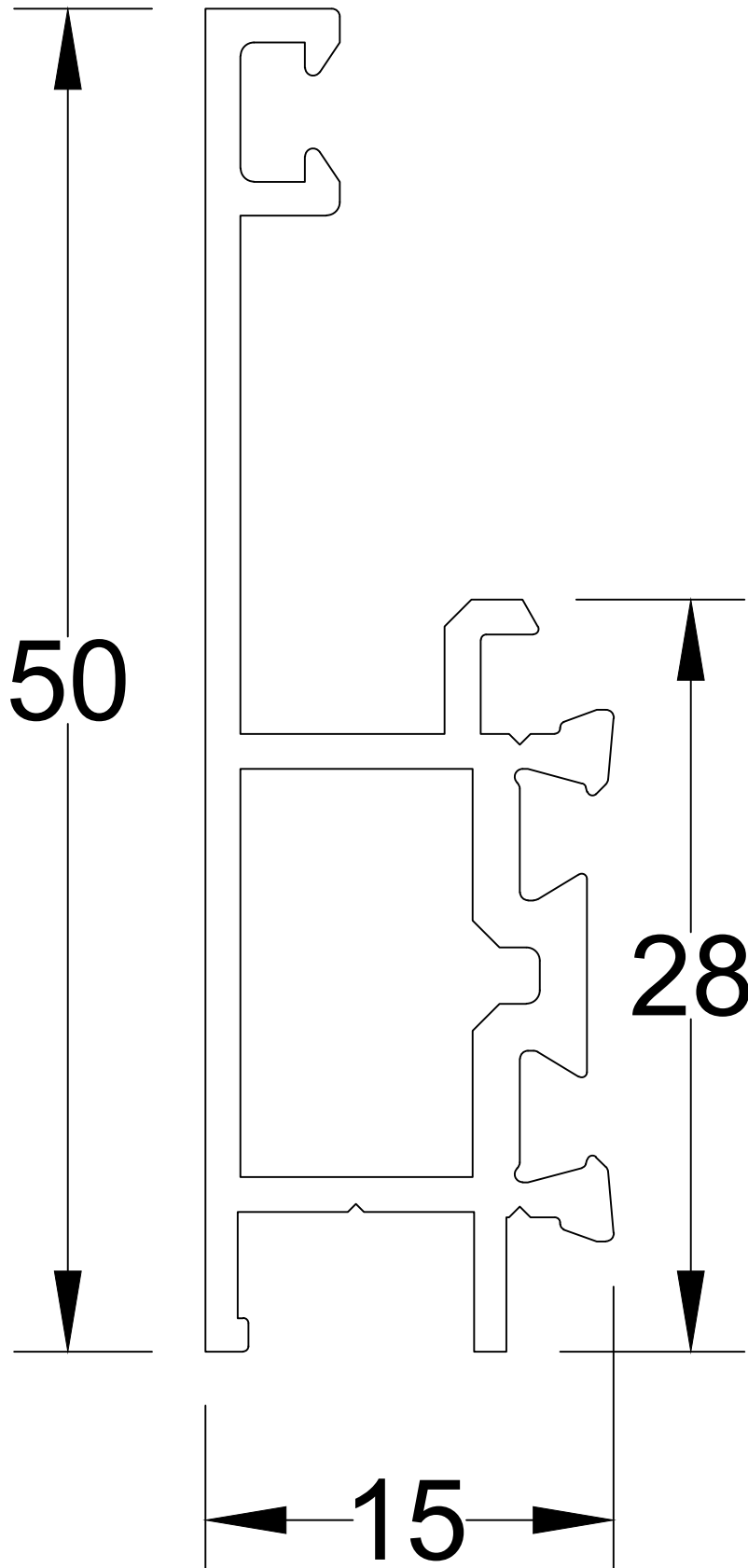
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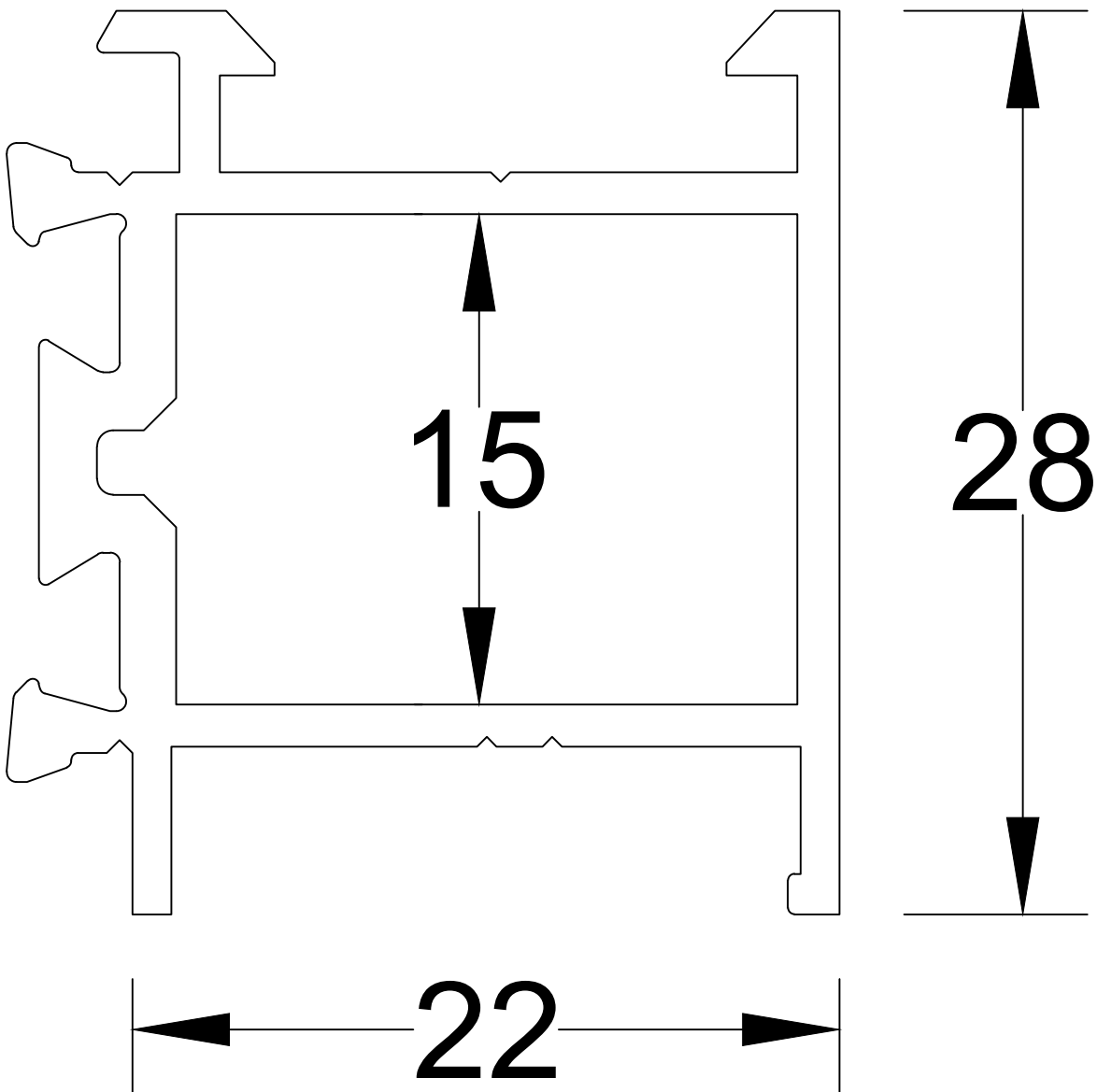
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Date: 08/05/18

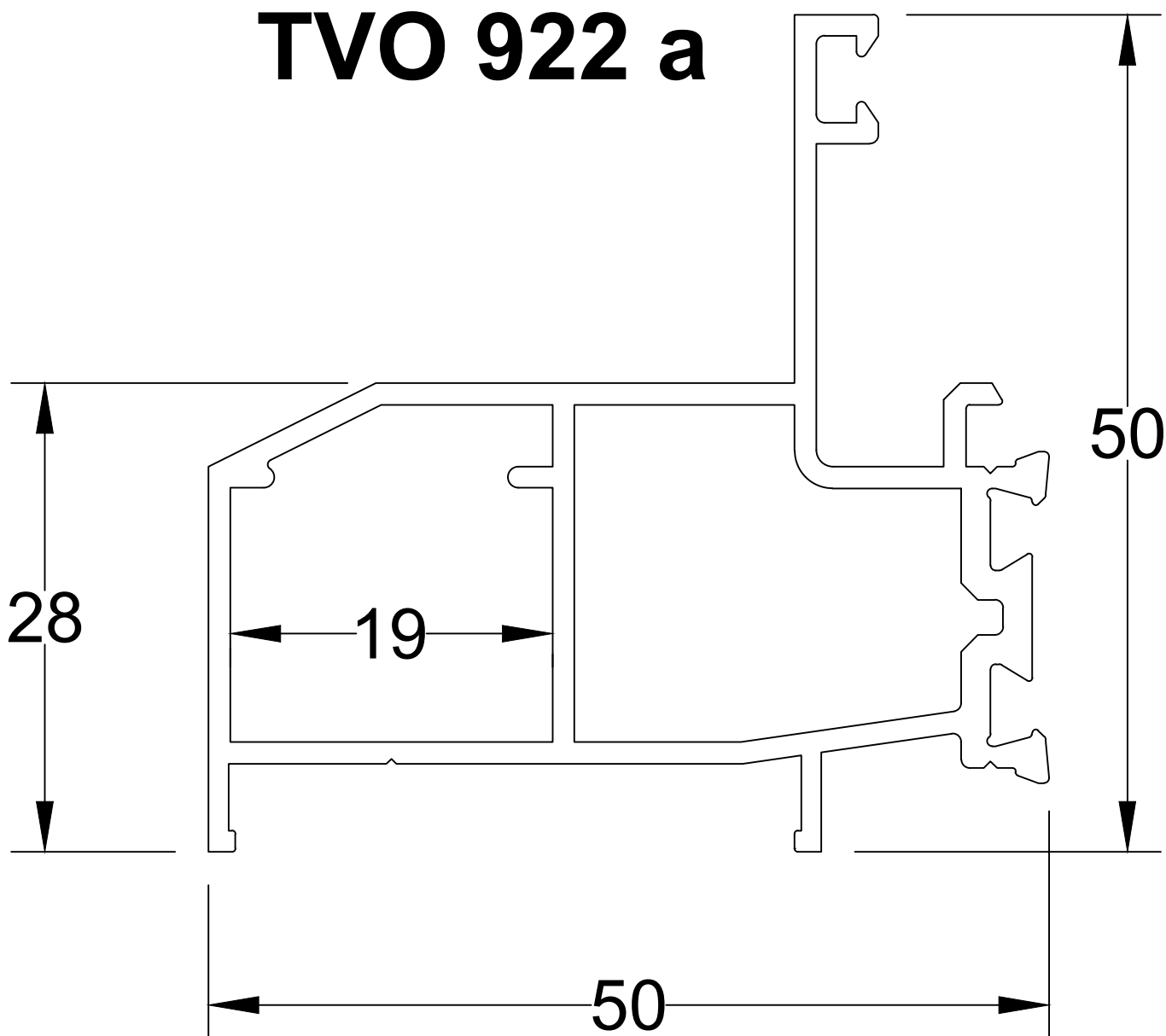
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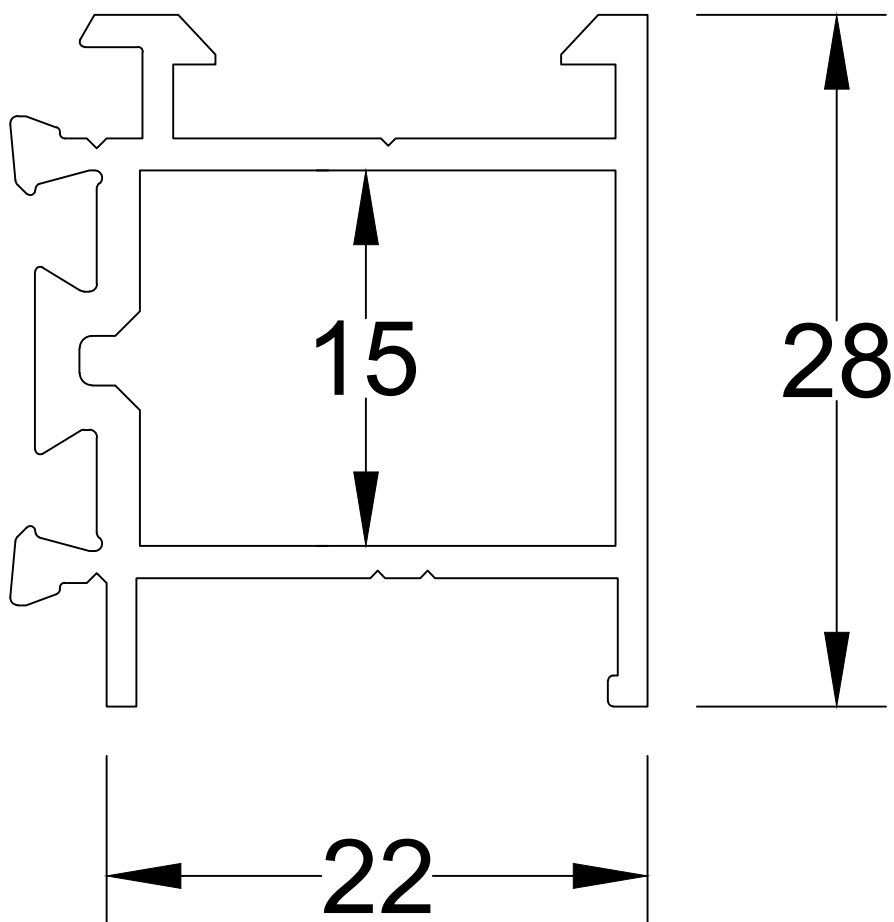
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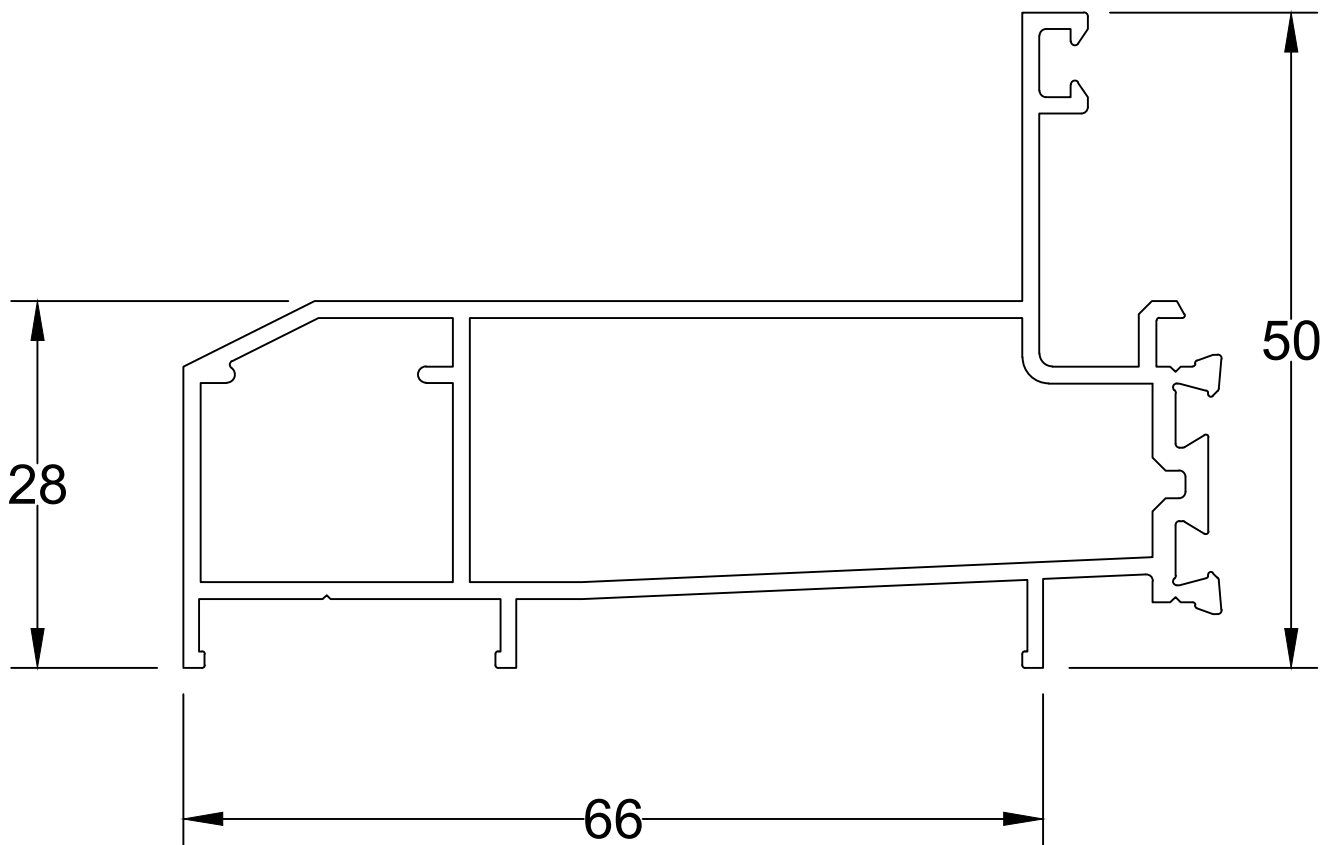
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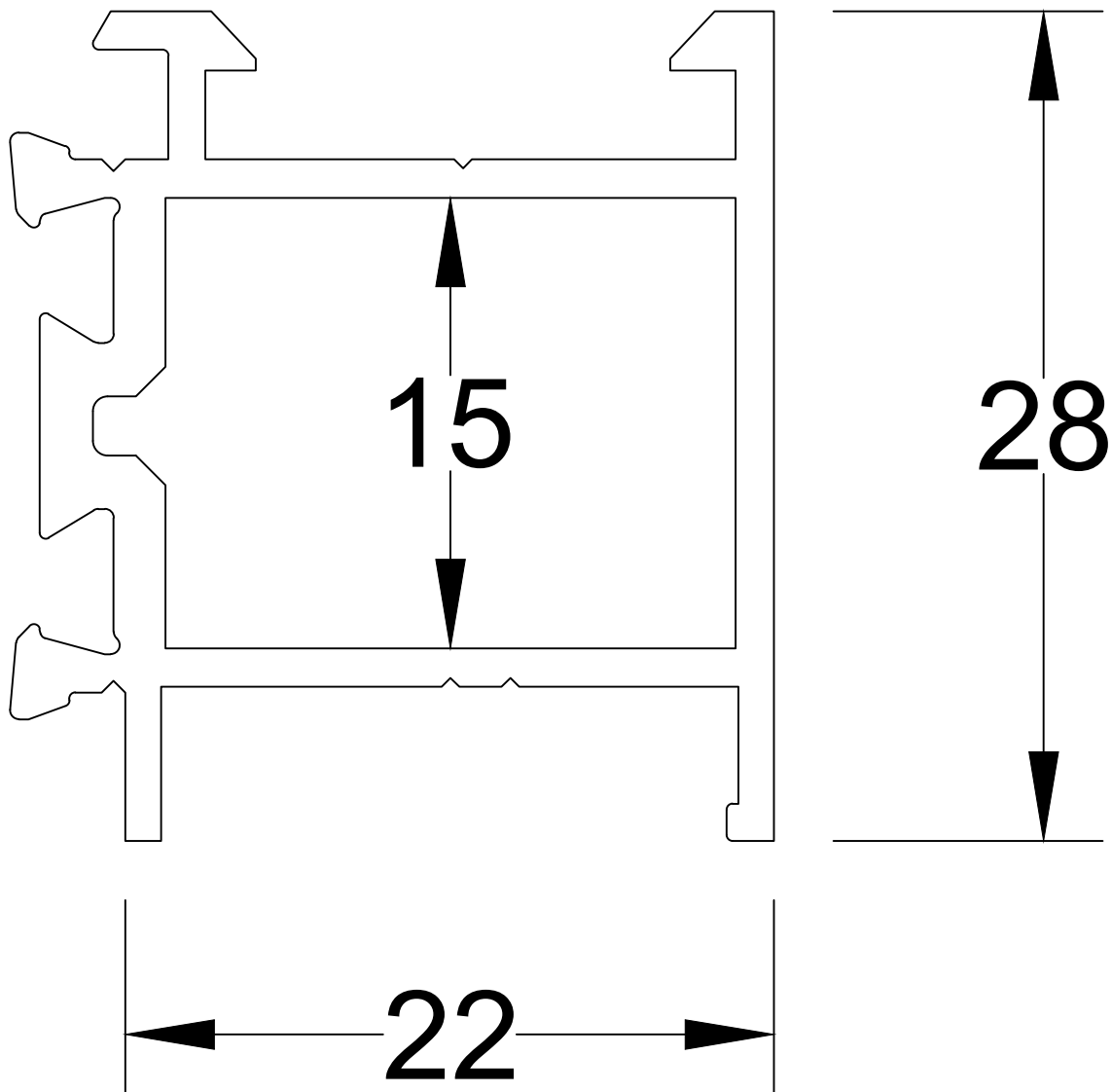
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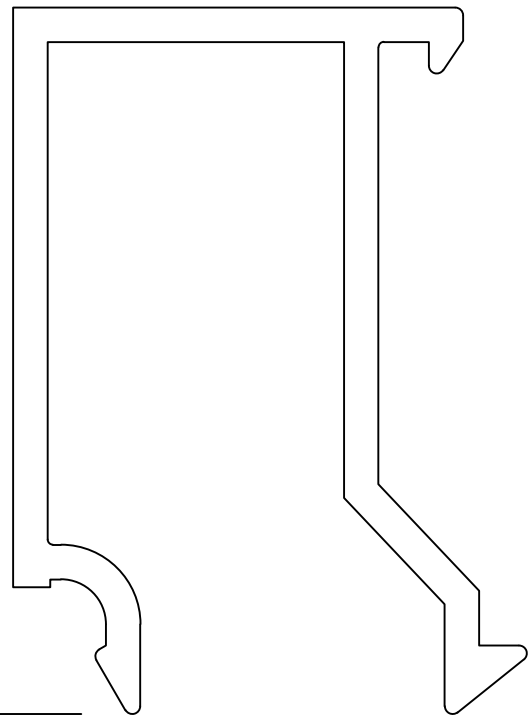
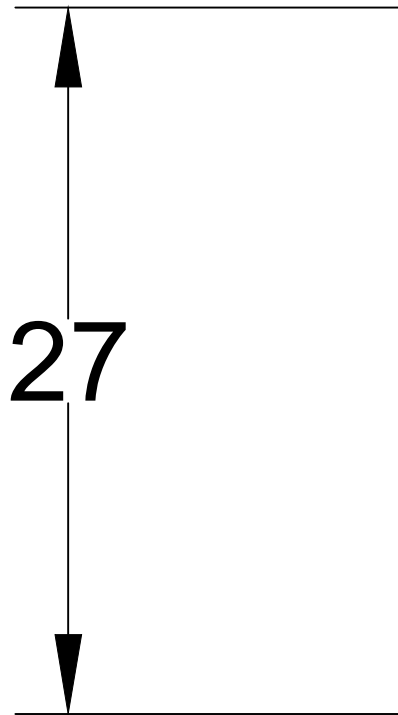
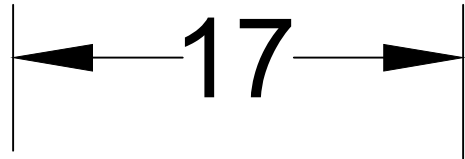
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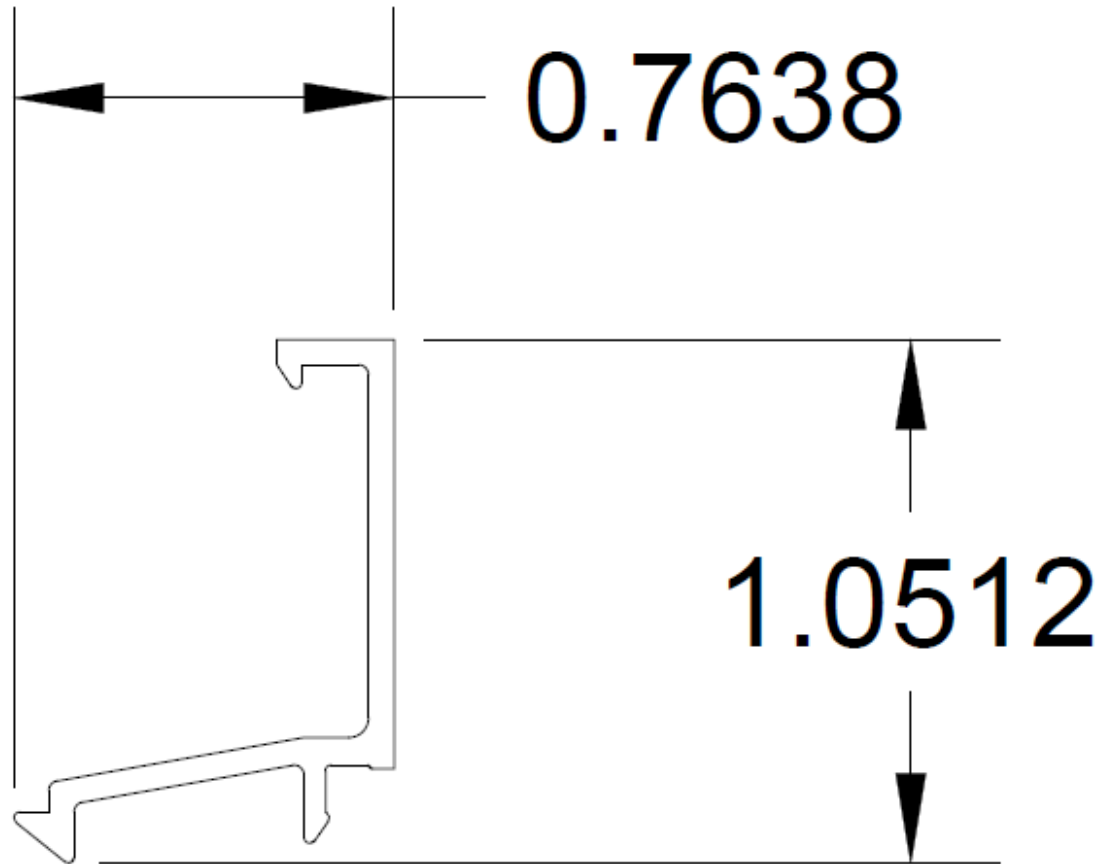
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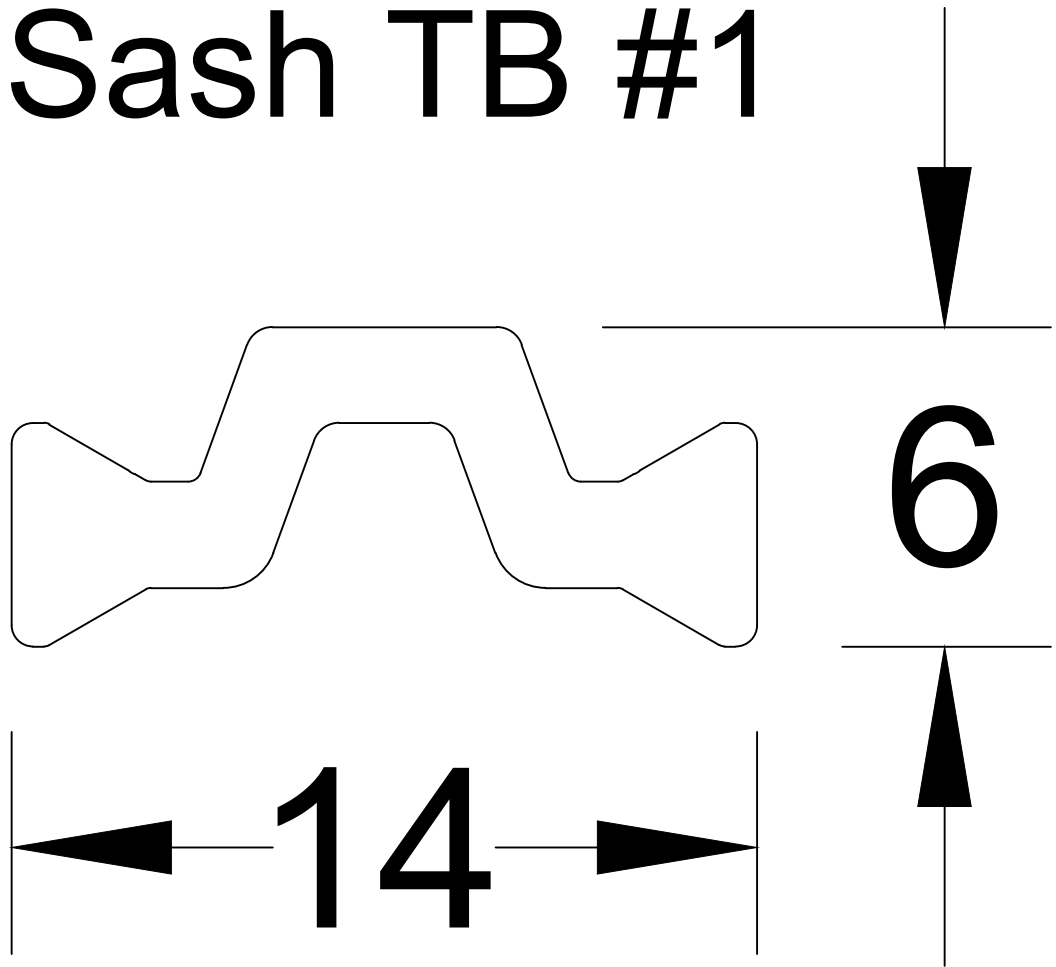
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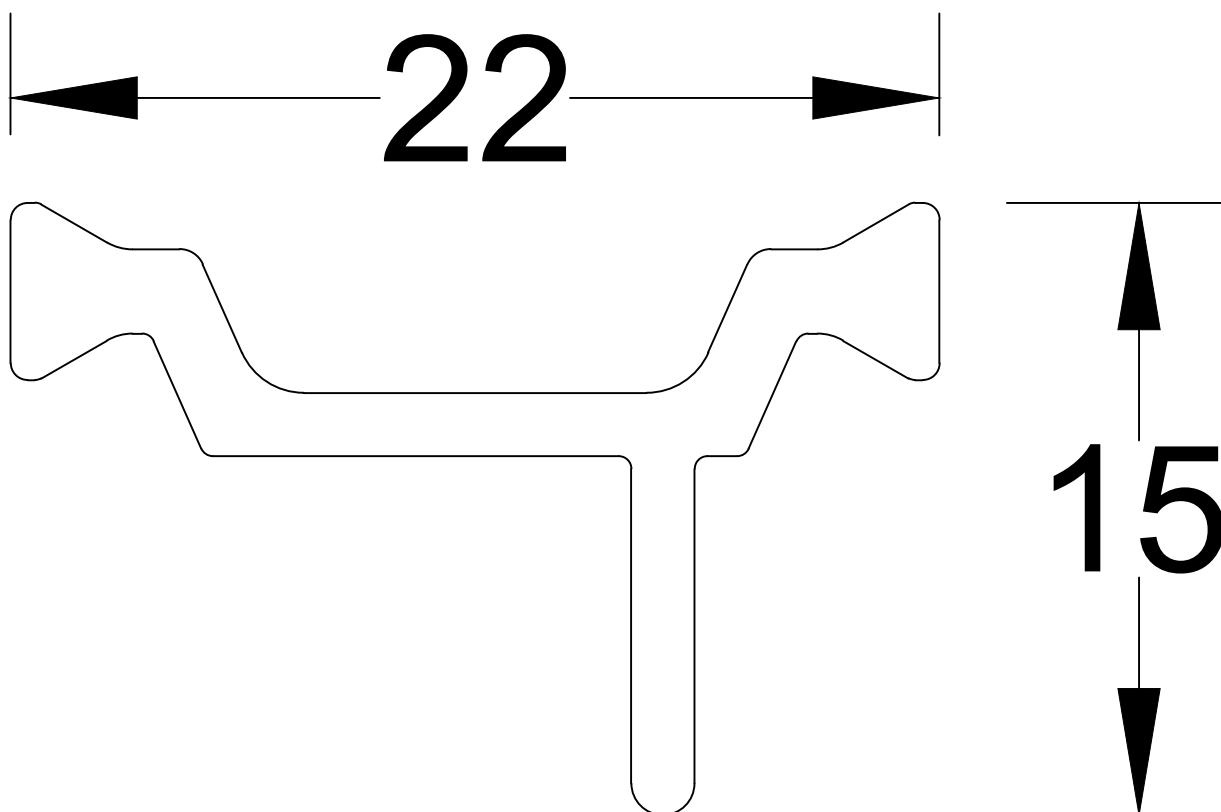
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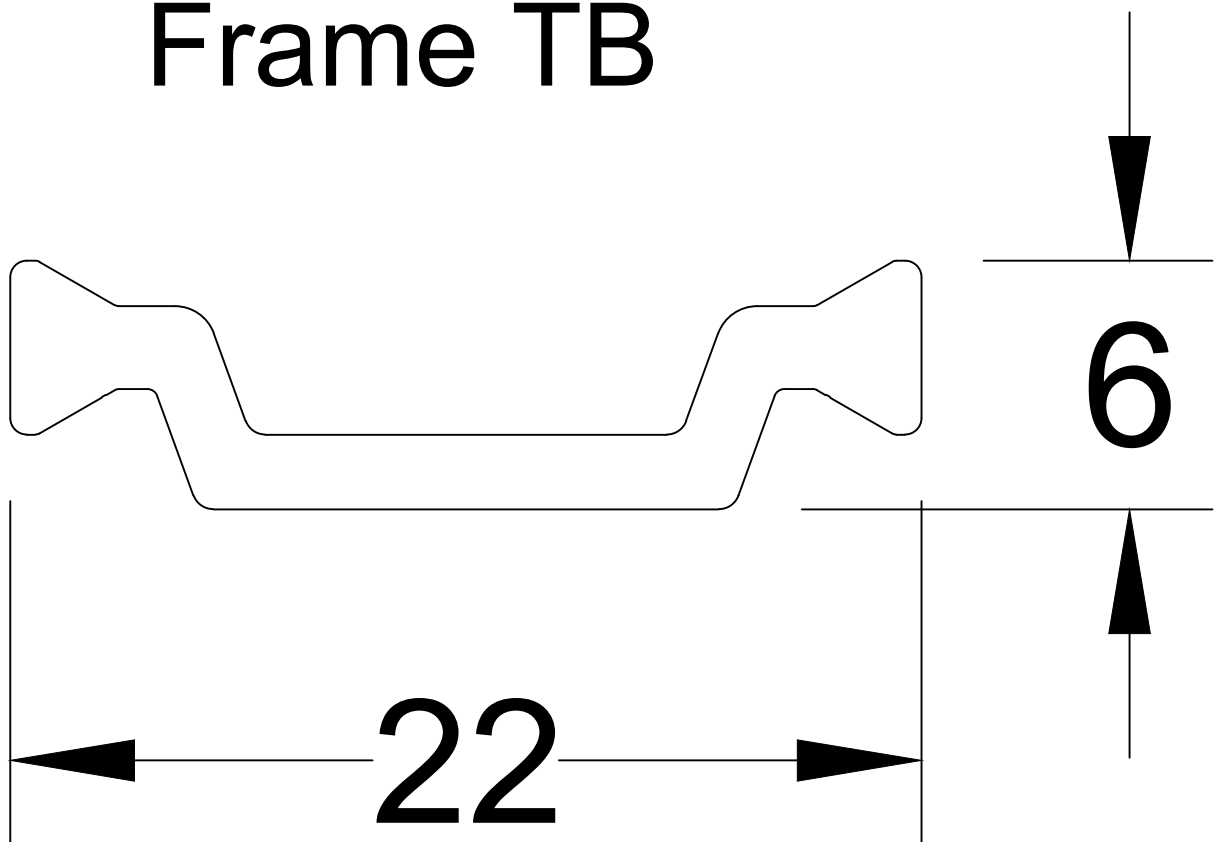
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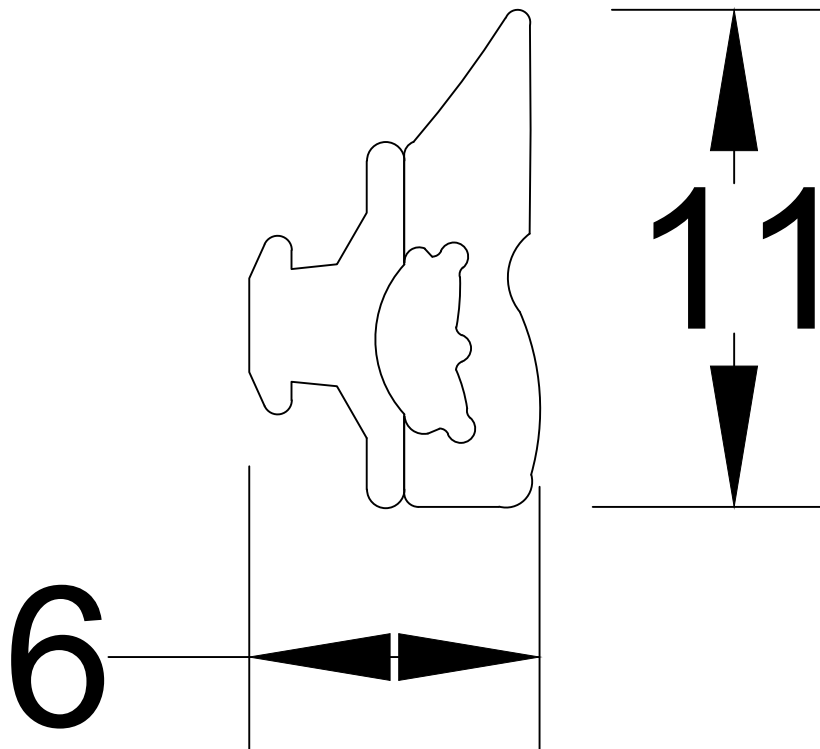
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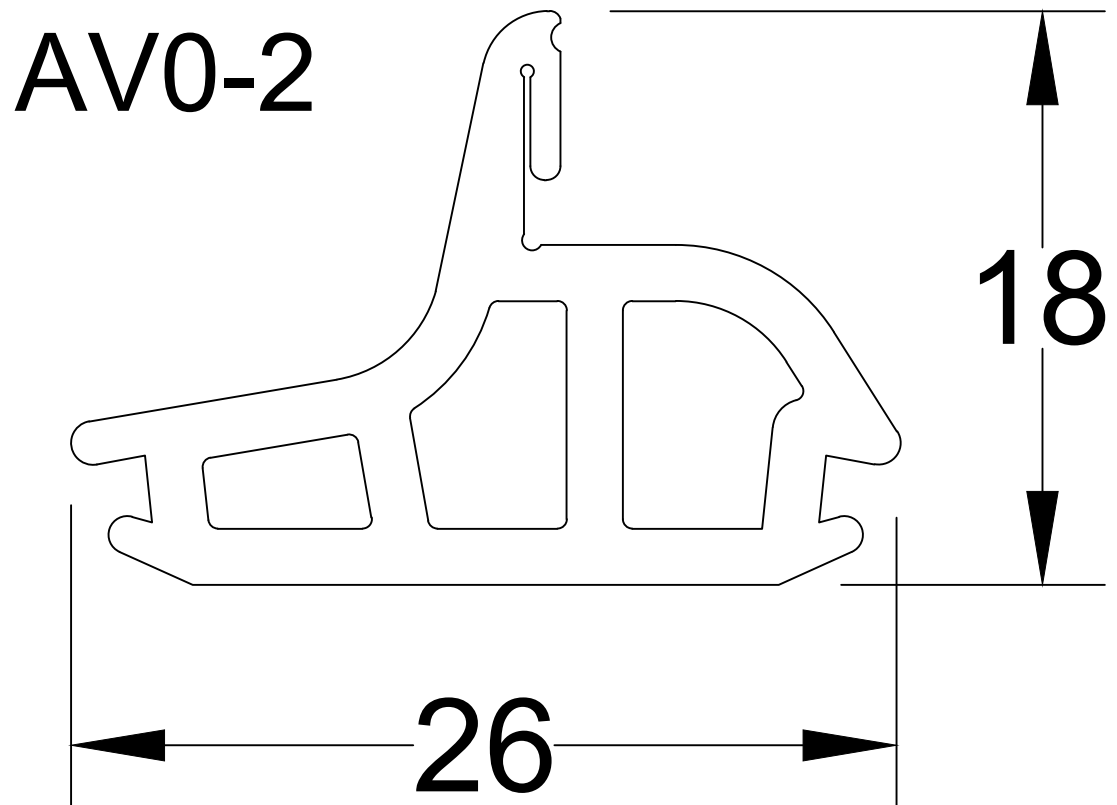


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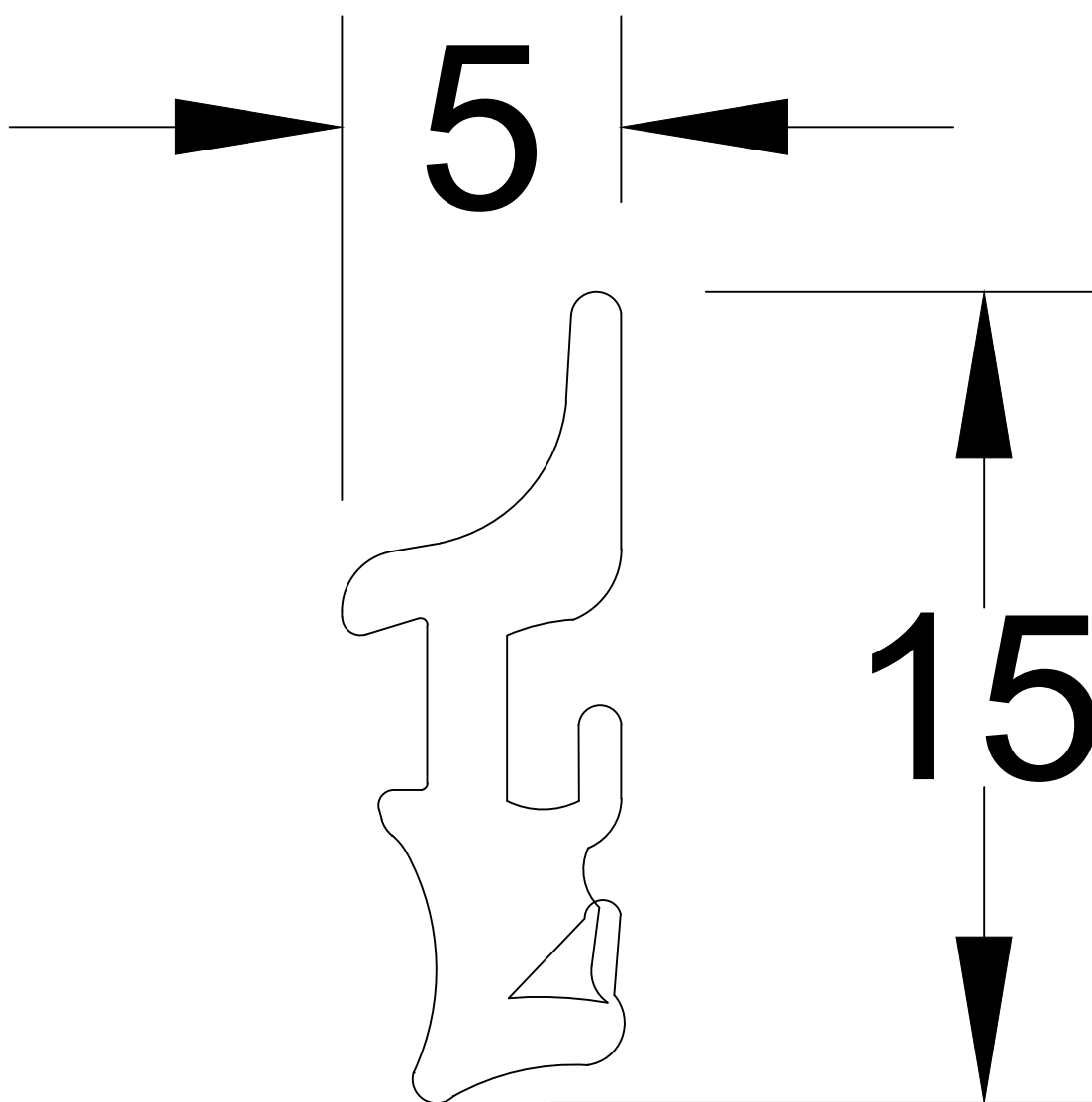


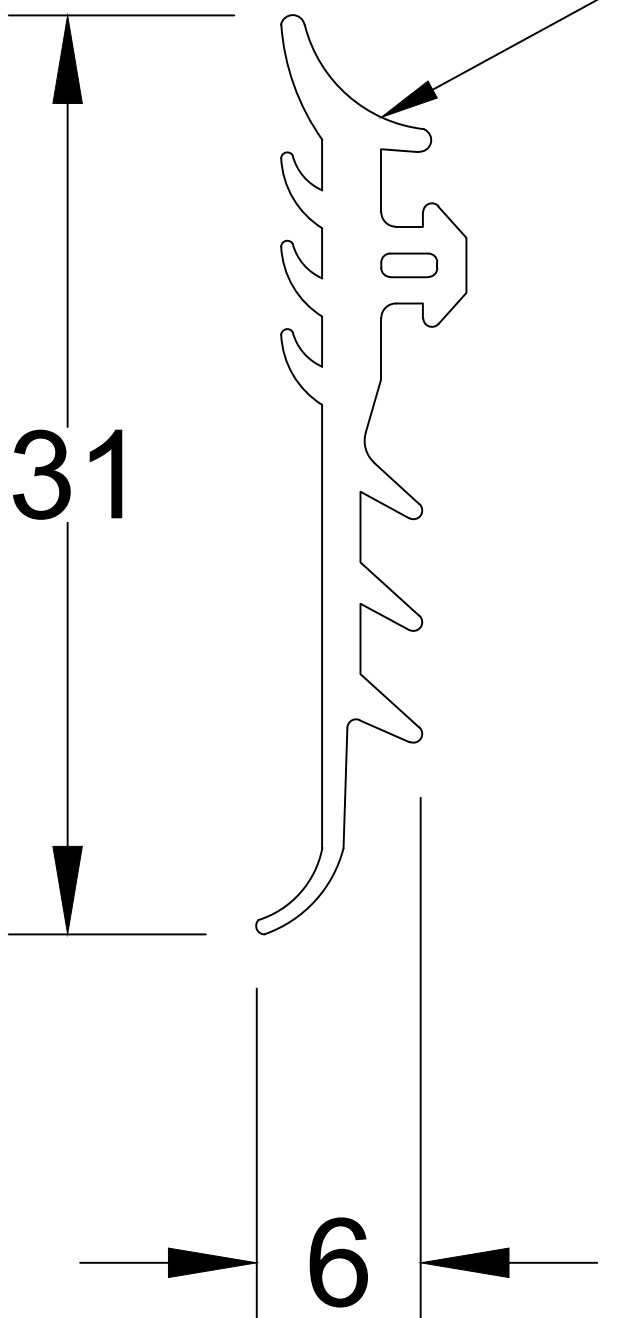
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P3

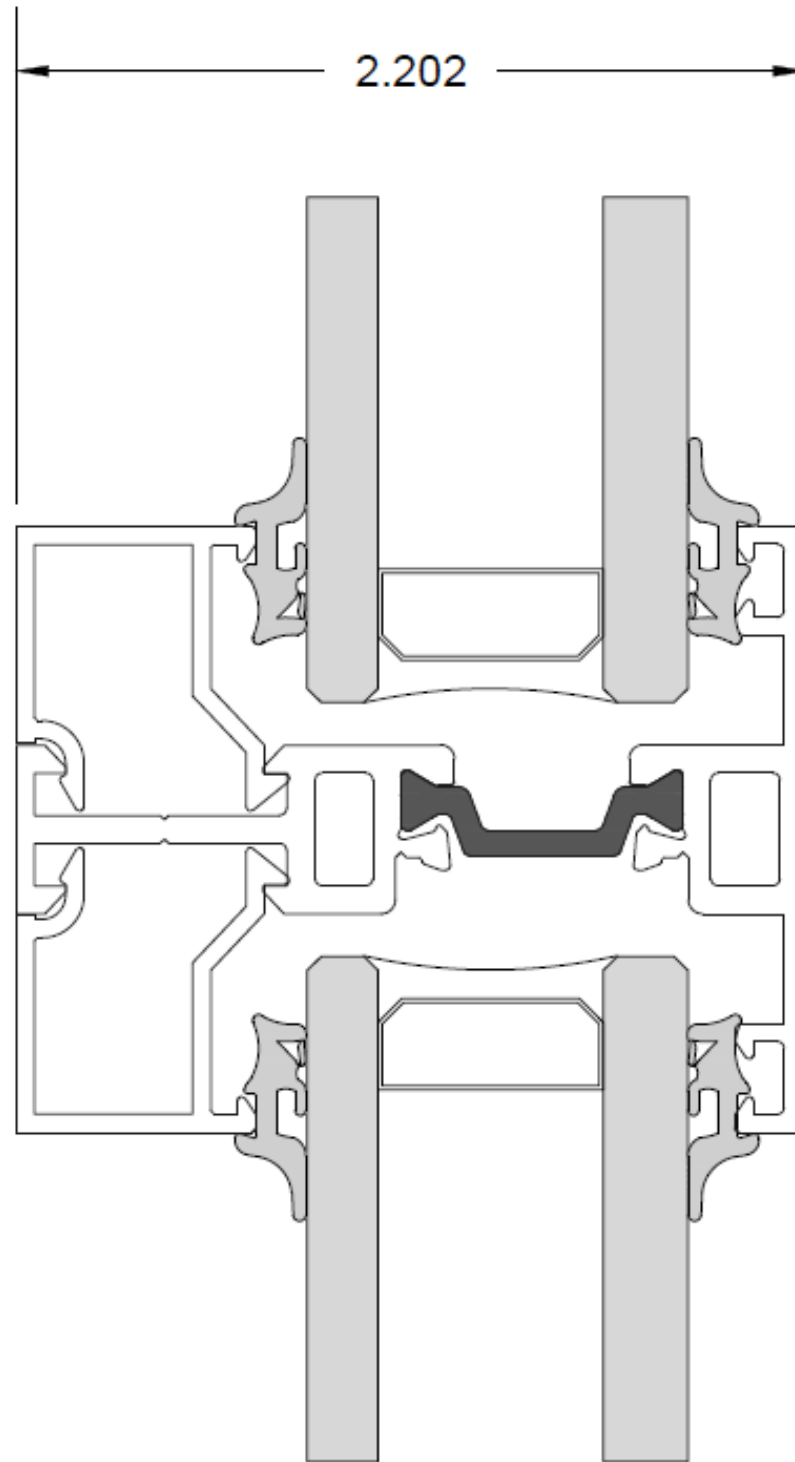




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VO-47

VO-47

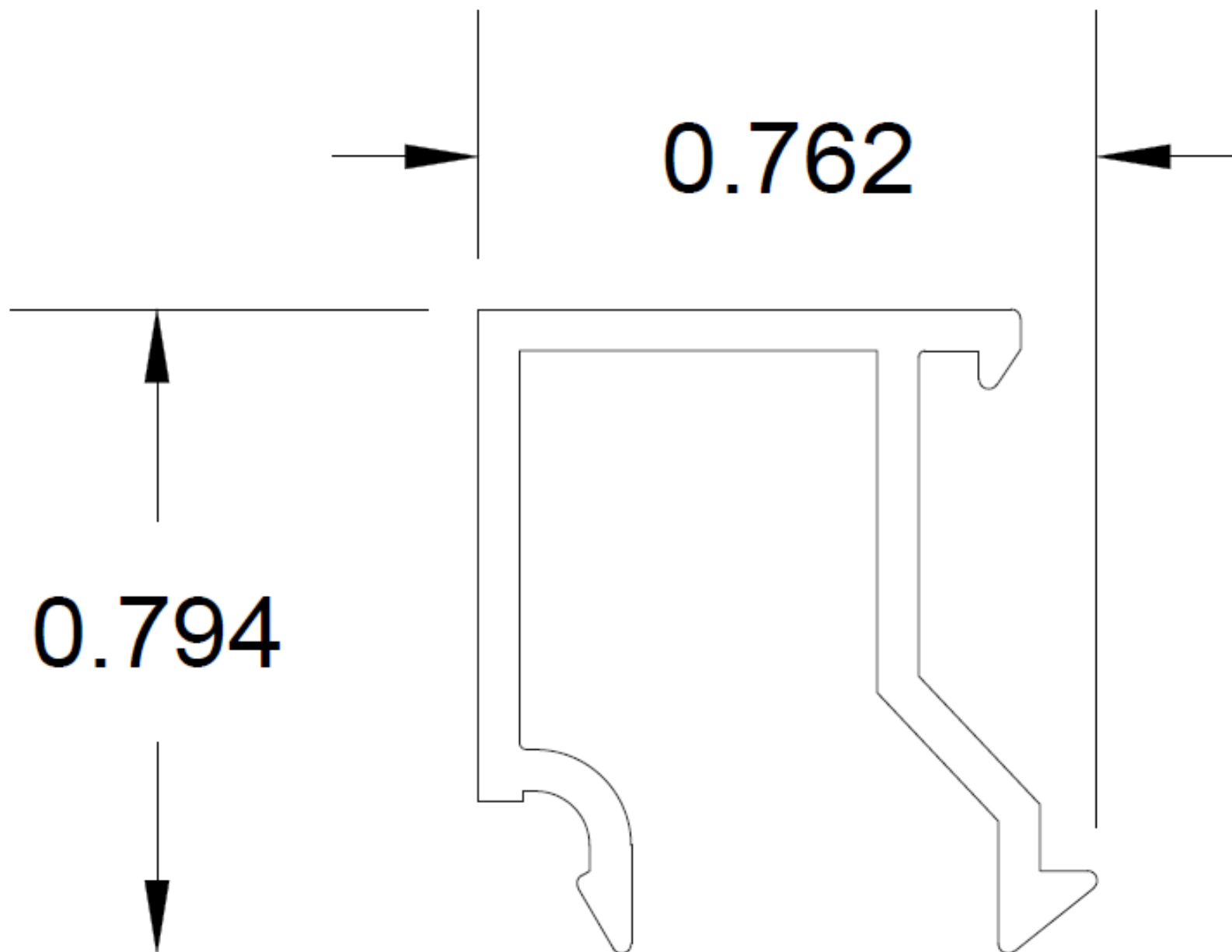


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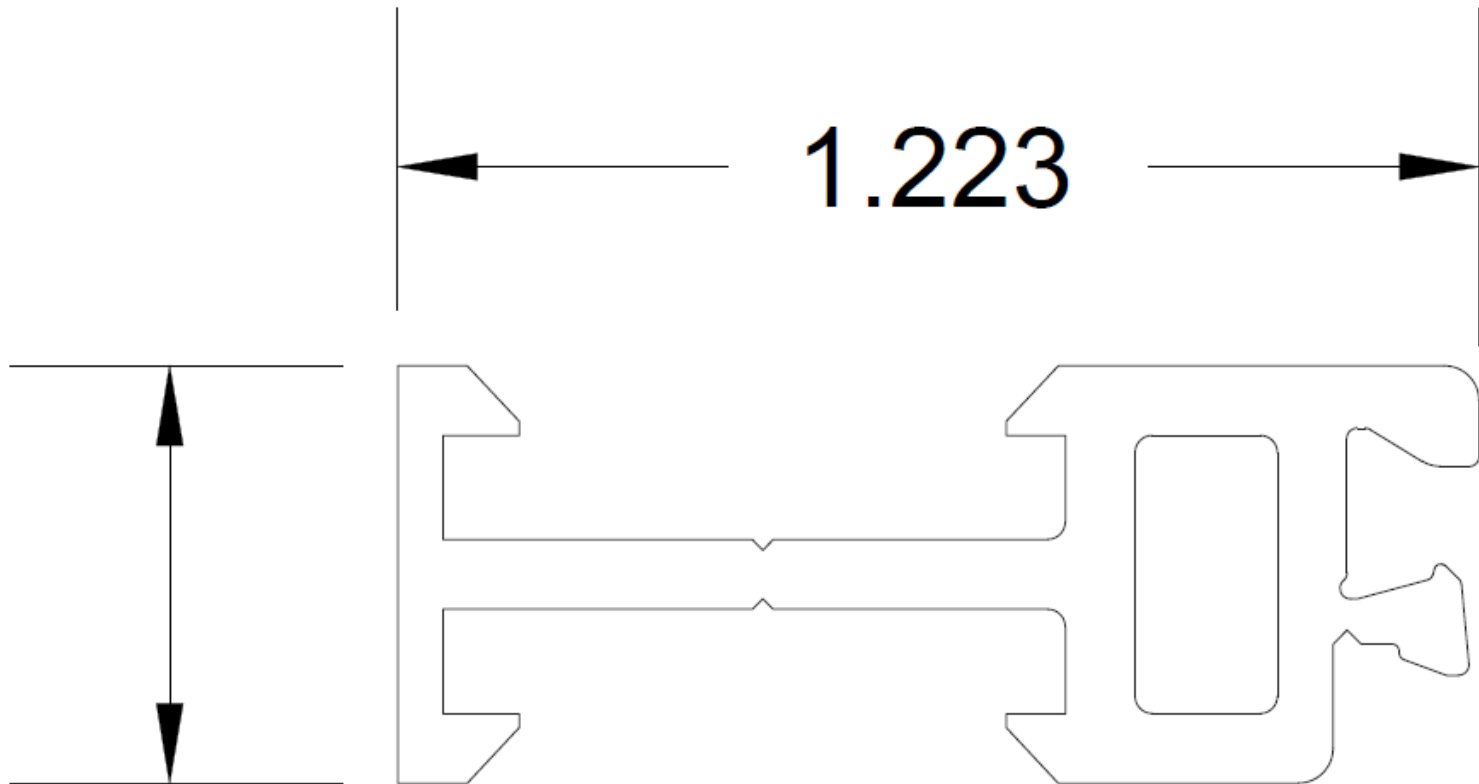
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TVO-906

TDL Part #1

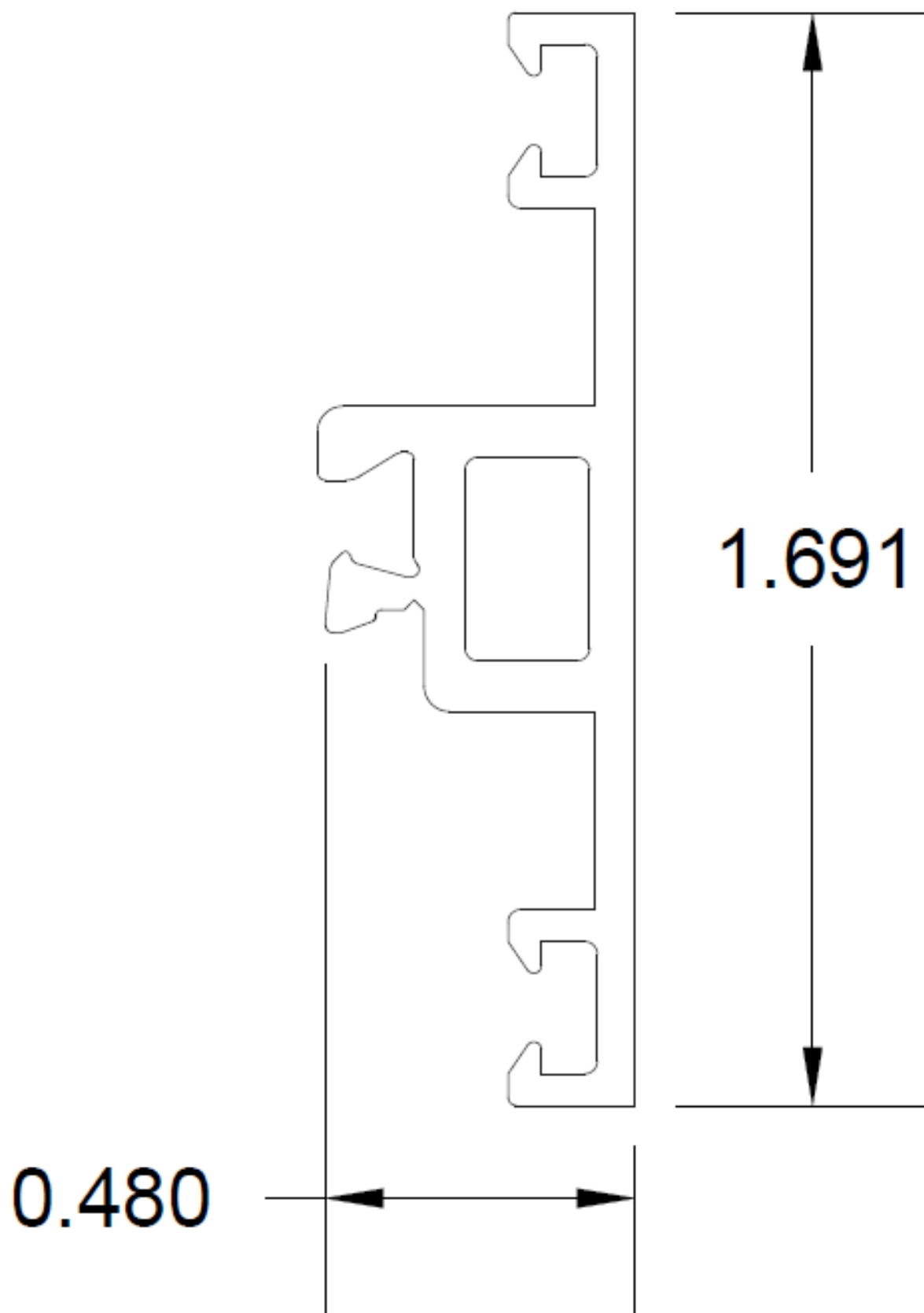


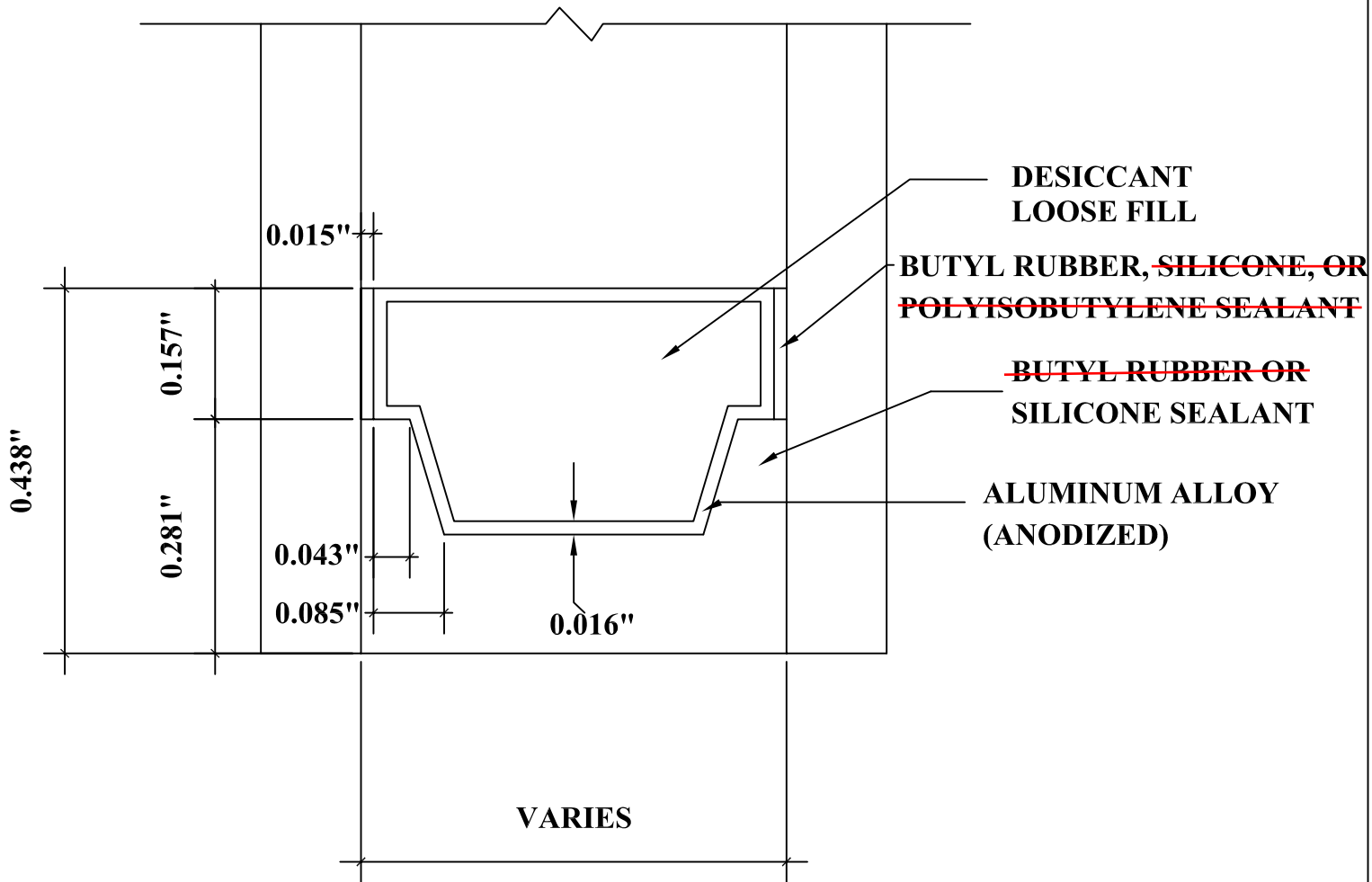
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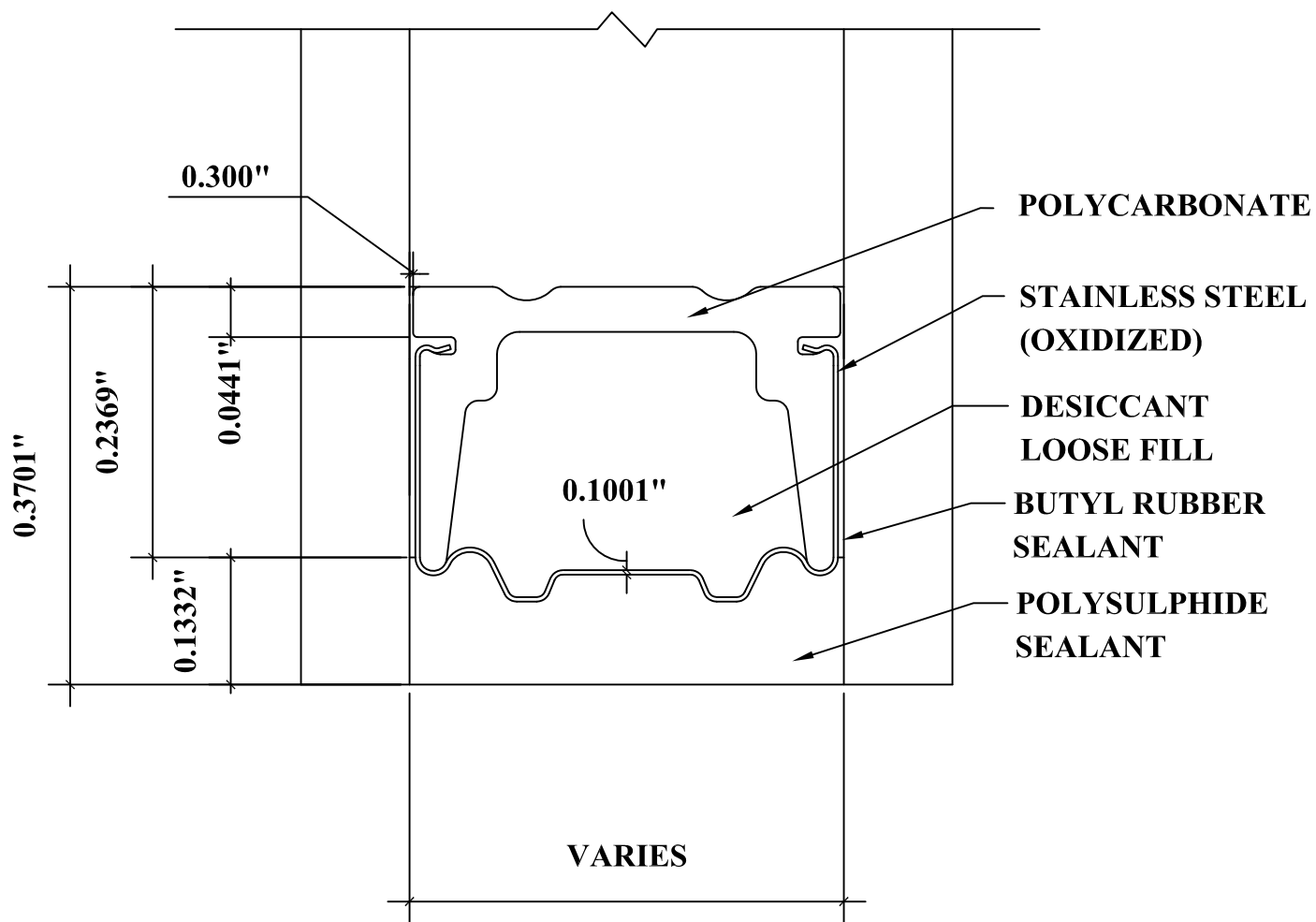
TDL Part #2

TDL Part #3

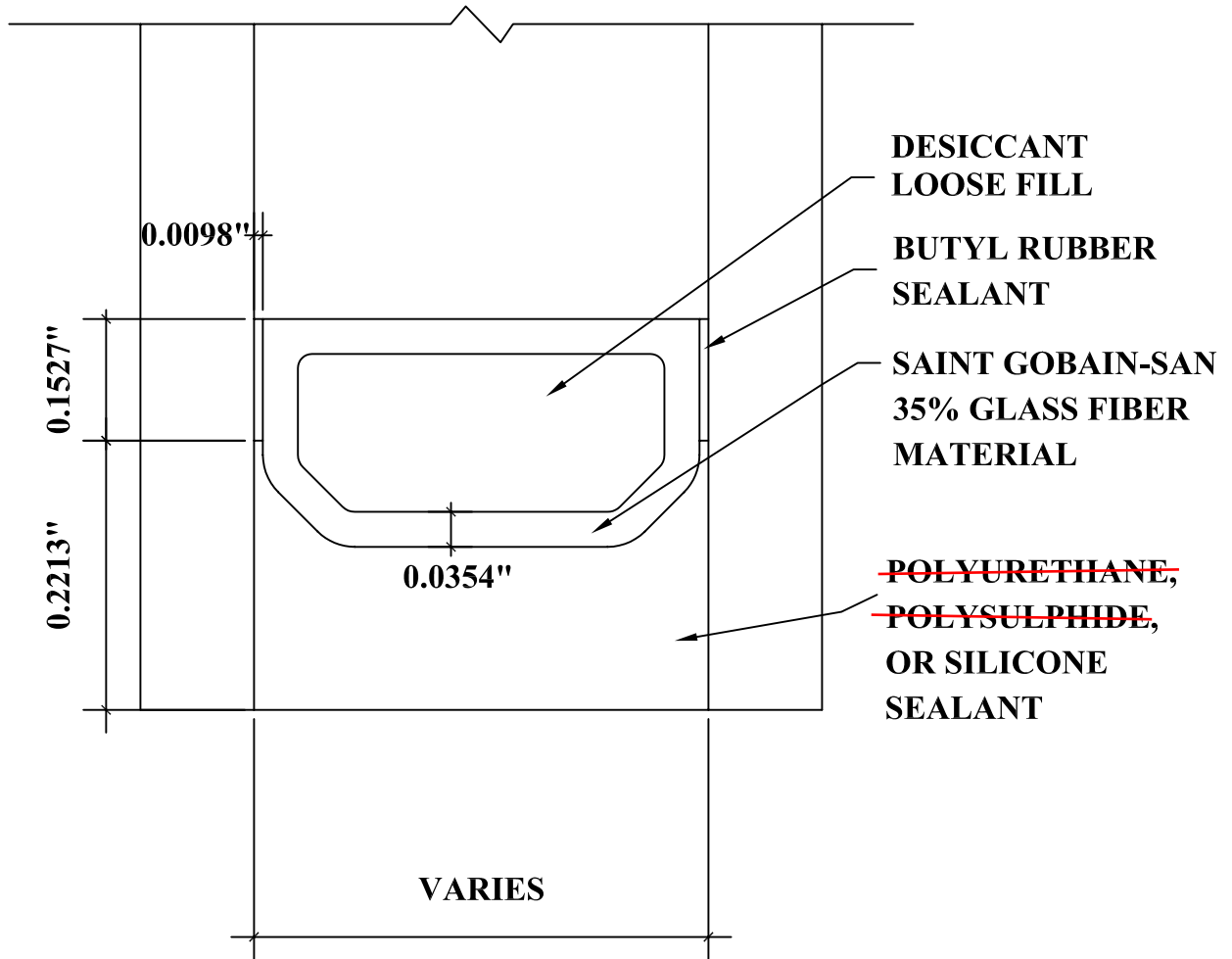




DETAIL FOR THERMAL MODELING OF
ALUMINUM SPACER (A1-D)



DETAIL FOR THERMAL MODELING OF
ROLLTECH CHROMATECH ULTRA SPACER (TS-D)



DETAIL FOR THERMAL MODELING OF
SAINT-GOBAIN SWISSPACER (TP-D)