MMM GROUP

NFRC 100
Procedure for Determining Fenestration Product U-Factors

NFRC 200
Solar Heat Gain Coefficient and Visible Transmittance

NFRC 500
Procedure for Determining Fenestration Product Condensation Resistance Values

Fenestration Simulation Report

575 Frameless Casement

Report Number

WIN14434w-b

Friday, November 14, 2014

Prepared For

Oren Anava
Windspec Inc.
1310 Creditstone Road
Concord, Ontario
L4K 5T7
(905)-738-8311

TABLE OF CONTENTS

Manufacturer:	Windspec Inc.
Report Number:	WIN14434w-b
Product Line:	575 Frameless Casement

Frame:	Thermally Broken Aluminum
Sash:	Thermally Broken Aluminum
Thermal Break:	V
Edge of Glass:	Interior edge of the glazing is held by EPDM gasket and silicone.

Glazing:	Glazing options are double, triple, low-e, air, argon or krypton fill.
Spacer:	Superspacer TriSeal: ZF-D, Aluminum: A1-D, Stainless Steel: SS-D

Weatherstripping:	EPDM bulbs on the frame and sash, santoprene fin on the frame.

Simulations:	Performed using WINDOW 6, and THERM 6.
General:	This product line includes the 575 Frameless Casement manufactured by Windspec Inc.
	Fixed and Curtain Wall configurations are grouped as per NFRC 100-2014 Section 4.2.1.H. The Fixed configuration is the Group Leader.

Tyler McPherson

Digitally signed by Tyler McPherson
DN: cn=Tyler McPherson, o=MMM Group, ou=Fenestration Services, email=mcphersont@mmm.ca, c=CA
Date: 2014.12.05 09:50:56 -05'00'

Tyler McPherson

Simulator

Simulator in Responsible Charge

The windows documented in this report were simulated in accordance with the NFRC 100: Procedure for Determining Fenestration Product U-Factors (2014), NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence (2014) and NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values (2014).

The windows were simulated using WINDOW 6 and THERM 6 computer programs as specified in NFRC 100 and NFRC 200. The most currently approved spectral data files from NFRC were also used. The WINDOW program models the one-dimensional heat flow through the center-of-glass portion of the window. The THERM program models the two-dimensional heat flow through the frame, edge-of-glass, divider, and divider-edge portions of the window. The input data for both programs is based on manufacturer's specifications. Defaults for material thermal and optical properties are given in the computer programs. When values other than defaults were used, they are documented.

Ratings values included in this report are for submittal to an NFRC-licenced 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 values included in this report are not considered in compliance with NFRC 100, NFRC 200, and/or NFRC 500 unless the associated validation test requirements have been satisfied, as applicable

DISCLAIMER:

This window simulation report was generated by MMM Group of Kitchener, ON. The report relates only to the items specified.

MMM Group and its employees neither endorse nor warrant the suitability of the product simulated. Every effort was taken to accurately model the performance of the windows documented in this report. Because of the large amount of input data and analyses, it is possible that errors or omissions could occur.

Neither MMM Group nor any of its employees shall be responsible for any loss or damage resulting directly or indirectly from any default, error, or omission.

SIMULATION NOTES

1 This is an "NFRC 100: Procedure for Determining Fenestration Product U-Factors" Certification Report.

2 This is an "NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence" Certification Report.

3 This is an "NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values" Certification Report.

4 Unit conversions and rounding are performed according to NFRC 601.

5 All glazing surface emissivities are assumed to be 0.84 unless otherwise stated.

6 The gas fill method is single probe with 90% argon or krypton fill.

7 Unless otherwise stated. All non-continuous hardware that does not create a thermal bridge such as hinges, balances, locks etc. are not modeled.

8 Where applicable, the following materials are used (Conductivity in W/mK): ADCO PIB-8 HSNB Gray (0.155), Cardinal Stainless Steel (14.187), Edgetech Silicone Foam S1 (0.19), Edgetech Silicone Foam S2 (0.102), Edgetech EPDM (0.127), GED Stainless Steel (13.63), TrueSeal Technologies Butyl 761-71X (0.231).

ID	Name	No. of Layers	Mode	Tilt	Environmental Conditions	Keff (Btu/h*ft*F)	Overall Thickness (in)	Uval (Btu/h* ft² F)	SHGC	Visible Transmittance
2	cl-arg-S400	2	#	90	NFRC 100-2010	0.017	1.000	0.277	0.636	0.761
3	cl-air-cl	2	#	90	NFRC 100-2010	0.041	1.000	0.471	0.704	0.786
4	SB70xl-kry-cl-kry-SB70XL	3	#	90	NFRC 100-2010	0.013	1.765	0.106	0.233	0.463
5	cl-arg-cl-arg-S400	3	#	90	NFRC 100-2010	0.026	1.765	0.191	0.548	0.680
6	cl-air-cl-air-cl	3	#	90	NFRC 100-2010	0.048	1.765	0.304	0.617	0.703
7	SB70xl-kry-SG400	2	#	90	NFRC 100-2010	0.012	1.000	0.181	0.265	0.618

NFRC Simulation Data – Summary

Manufacturer: Windspec Inc.

Series/Model #: 575 Frameless Casement

Spacer: Superspacer TriSeal: ZF-D, Aluminum: A1-D, Stainless Steel: SS-D

Operator Type: CSSV

Model Size: 600 x 1500

Thermal Break: V

Sim Lab Code: SEEL

Report number: WIN14434w-b

Date: 11/14/2014

Revised Date:

Rating Procedure: 2014

Mfr Product Code	Product Number	Gap 1 (in)	Gap 2 (in)	Gap Fill 1	Gap Fill 2	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Tint	Spacer	Grid Type	Grid Size	U-Factor (Btu/h*ft²F)	SHGC	VT	*CR
cl-arg-S400, al	0001	0.53		ARG			0.12			CL	A1-D	N		0.44	0.48	0.54	52
cl-arg-S400, sl	0002	0.53		ARG			0.12			CL	SS-D	N		0.42	0.48	0.54	56
cl-arg-S400, ts	0003	0.53		ARG			0.12			CL	ZF-D	N		0.38	0.48	0.54	62
cl-air-cl, al	0004	0.53		AIR						CL	A1-D	N		0.58	0.53	0.55	44
cl-air-cl, sl	0005	0.53		AIR						CL	SS-D	N		0.56	0.53	0.55	45
cl-air-cl, ts	0006	0.53		AIR						CL	ZF-D	N		0.53	0.53	0.55	46
SB70xl-kry-cl-kry-SB70XL, al	0007	0.53	0.53	KRY	KRY	0.02			0.02	CL	A1-D	N		0.27	0.19	0.33	64
SB70xl-kry-cl-kry-SB70XL, sl	0008	0.53	0.53	KRY	KRY	0.02			0.02	CL	SS-D	N		0.24	0.19	0.33	69
SB70xl-kry-cl-kry-SB70XL, ts	0009	0.53	0.53	KRY	KRY	0.02			0.02	CL	ZF-D	N		0.20	0.19	0.33	78
cl-arg-cl-arg-S400, al	0010	0.53	0.53	ARG	ARG				0.12	CL	A1-D	N		0.34	0.42	0.48	62
cl-arg-cl-arg-S400, sl	0011	0.53	0.53	ARG	ARG				0.12	CL	SS-D	N		0.31	0.42	0.48	67
cl-arg-cl-arg-S400, ts	0012	0.53	0.53	ARG	ARG				0.12	CL	ZF-D	N		0.27	0.42	0.48	73
cl-air-cl-air-cl, al	0013	0.53	0.53	AIR	AIR					CL	A1-D	N		0.42	0.46	0.50	58
cl-air-cl-air-cl, sl	0014	0.53	0.53	AIR	AIR					CL	SS-D	N		0.39	0.46	0.50	60
cl-air-cl-air-cl, ts	0015	0.53	0.53	AIR	AIR					CL	ZF-D	N		0.35	0.46	0.50	63
SB70xl-kry-SG400, al	0016	0.53		KRY		0.02		0.12		CL	A1-D	N		0.38	0.22	0.44	52
SB70xl-kry-SG400, sl	0017	0.53		KRY		0.02		0.12		CL	SS-D	N		0.35	0.22	0.44	53
SB70xl-kry-SG400, ts	0018	0.53		KRY		0.02		0.12		CL	ZF-D	N		0.31	0.22	0.44	56

* Note: 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.

APPENDIX A

Group Leader Calculations

Appendix A - Group Leader Calculations

Manufacturer:	Windspec Inc.	Sim Lab Code:	SEEL
Series/Model #:	575 Frameless Casement	Report number:	WIN14434w-b
Operator Type:	CSSV	Date:	11/14/2014
Model Size:	600 x 1500	Revised Date:	
		Rating Procedure:	2014

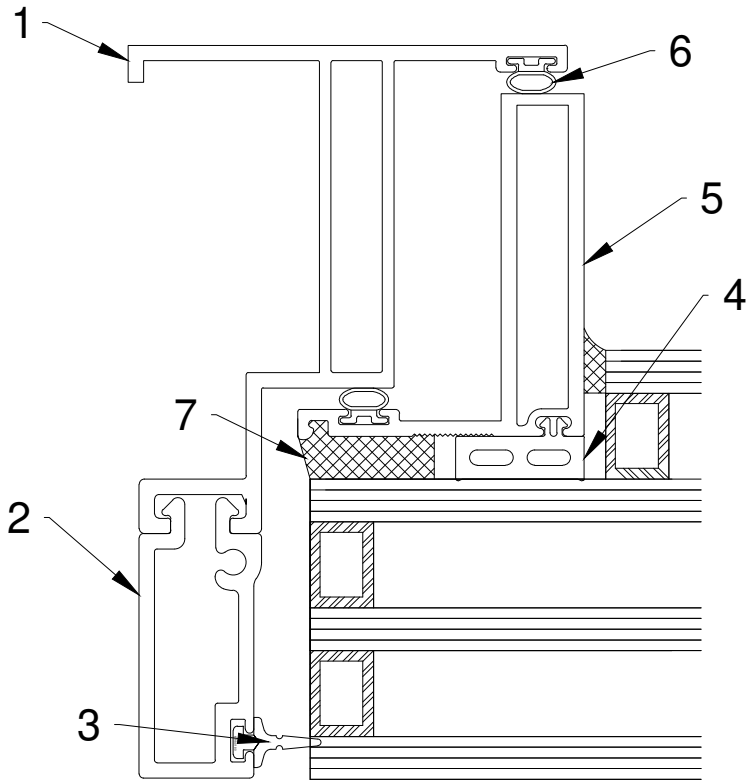
Curtain Wall vs Fixed

Product Description	U-Factor (Btu/ h* ft² F)	Group Leader
SB70xl-kry-cl-kry-SB70XL, tal, Fixed	0.273	Yes
SB70xl-kry-cl-kry-SB70XL, tal, CW	0.269	No

APPENDIX B

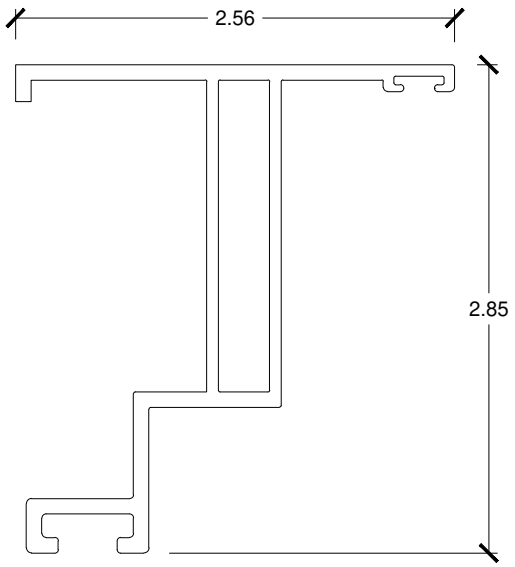
Product Drawings

FIXED FRAME TRIPLE GLAZED OPTION 2



1	ALUMINIUM FRAME
2	RIGID PVC ADAPTOR
3	SANTOPRENE SWEEP
4	SILICONE PRESET
5	ALUMINIUM SASH
6	SANTOPRENE GASKET
7	SILICONE SEALANT

1



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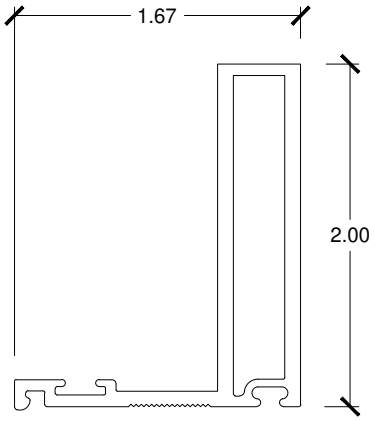

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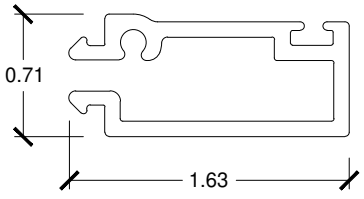

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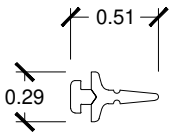

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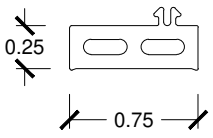

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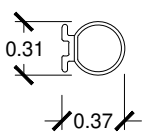
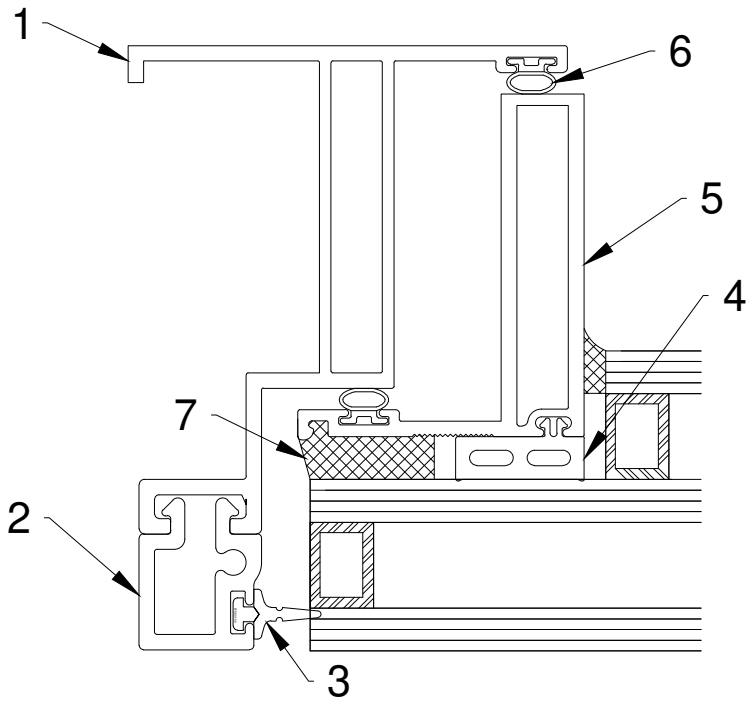
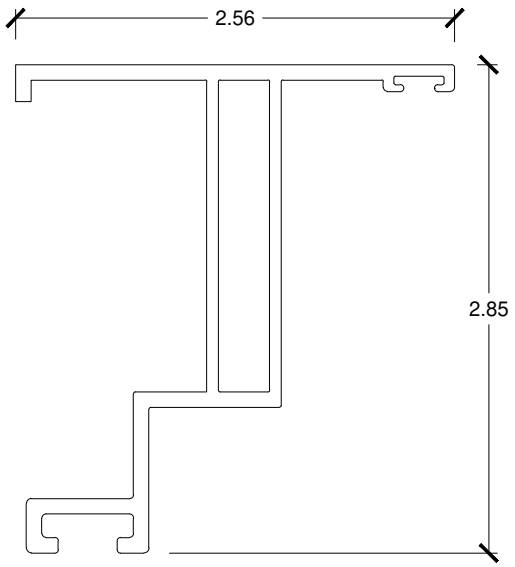


FIXED FRAME TRIPLE GLAZED OPTION 1



1	ALUMINIUM FRAME
2	RIGID PVC ADAPTOR
3	SANTOPRENE SWEEP
4	SILICONE PRESET
5	ALUMINIUM SASH
6	SANTOPRENE GASKET
7	SILICONE SEALANT

1



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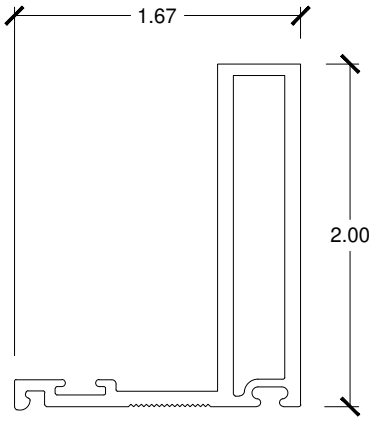

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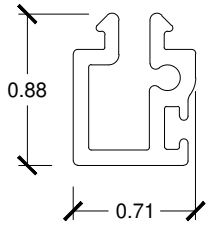

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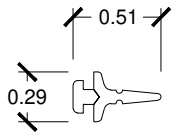

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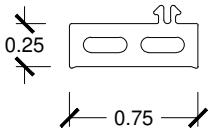

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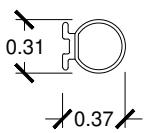
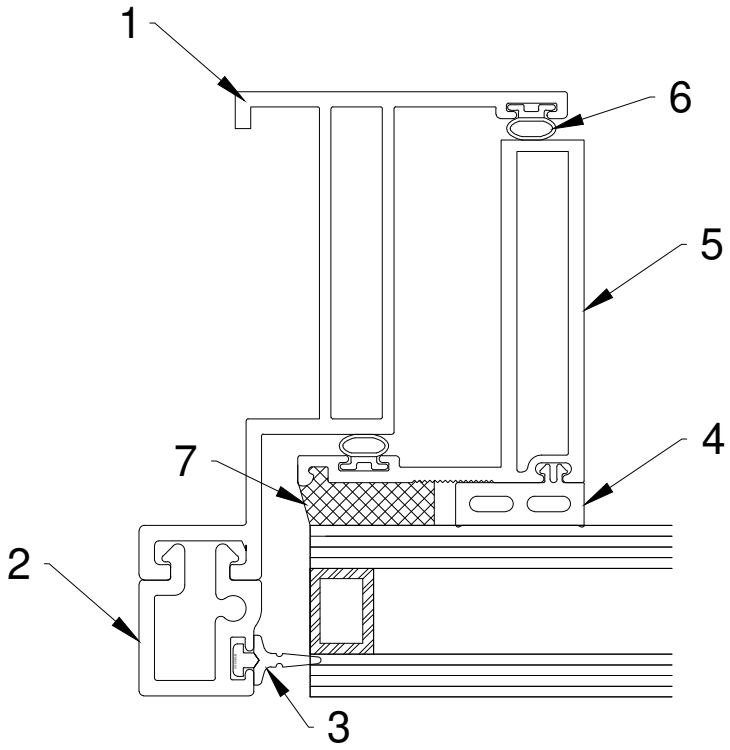


CURTAIN WALL



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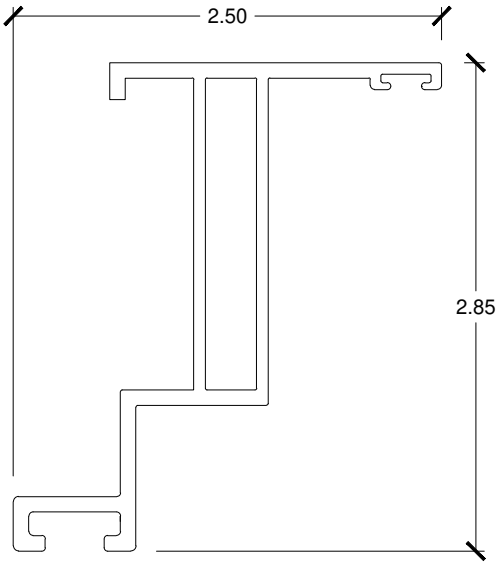
1



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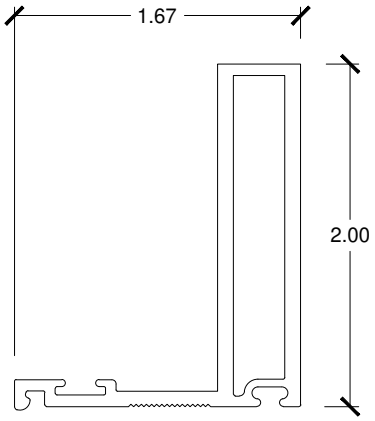

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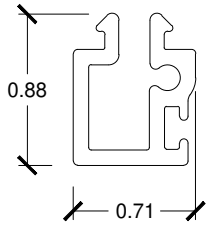

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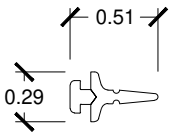

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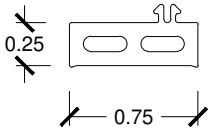

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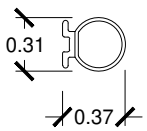
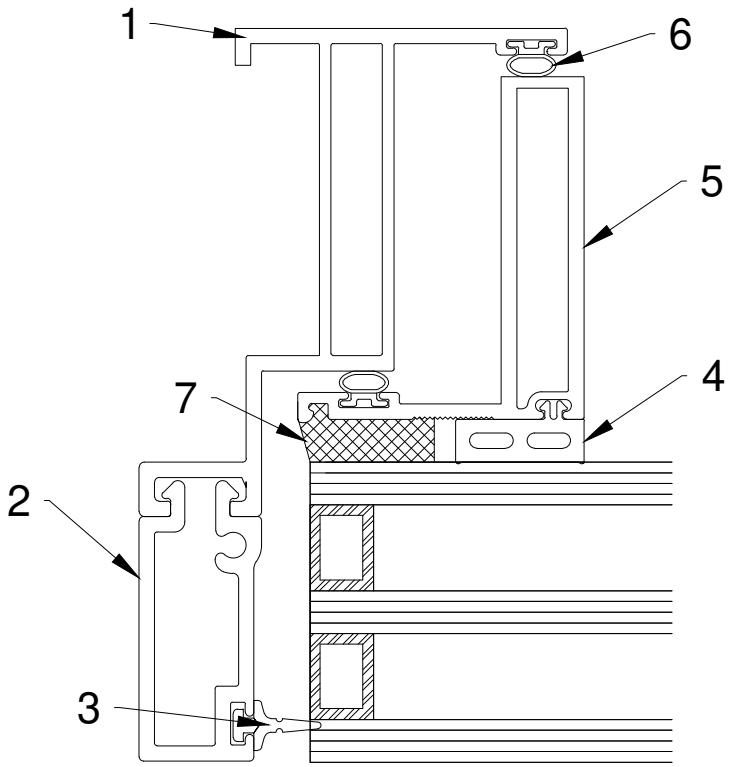


CURTAIN WALL TRIPLE GLAZED



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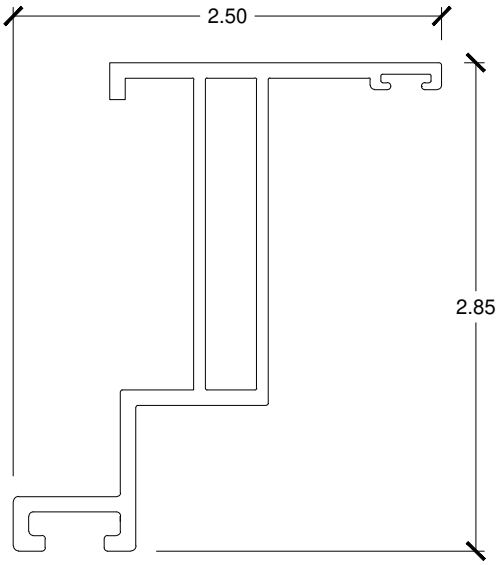
1



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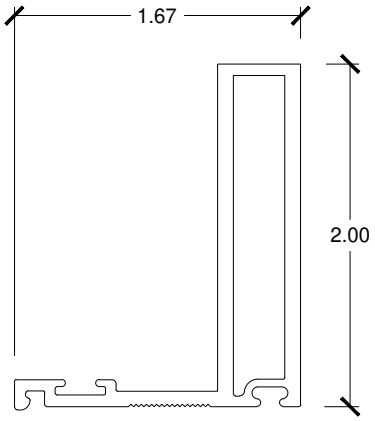

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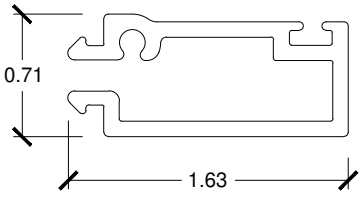

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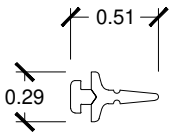

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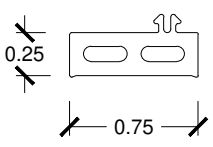

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