



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

855 875 Window Wall

Report Number

WIN14460w

Wednesday, December 24, 2014

Prepared For

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Manufacturer: Windspec Inc.

Report Number: WIN14460w

Product Line: 855 875 Window Wall

Frame: Thermally Broken Aluminum

Sash: NA

Thermal Break: P

Edge of Glass: Interior edge of the glazing is held by silicone or butyl rubber gasket, exterior edge is held by butyl rubber gasket.

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: NA

Simulations: Performed using WINDOW 6, and THERM 6.

General: This product line includes the 855 875 Window Wall manufactured by Windspec Inc.

2 interior frames (Short, Long) are used in the product line. A group leader calculation was performed and the Long interior frame is the group leader.

3 Exterior frames (Flat, Short, Long) are used in the product line. A group leader calculation was performed and the Long exterior frame is the group leader.

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Simulator



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Simulator in Responsible Charge

WINDOW SIMULATION REPORT

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-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 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 Ltd. of Kitchener, ON. The report relates only to the items specified.

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MMM Group Ltd. 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 Ltd. 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*ft² 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 #: 855 875 Window Wall

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

Operator Type: CSSV Sim Lab Code: SEEL
Model Size: 2000 x 2000 Report number: WIN14460w
Thermal Break: P Date: 12/24/2014
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		0.39	0.58	0.68	0
cl-arg-S400, sl	0002	0.53		ARG		0.12				CL	SS-D	N		0.37	0.58	0.68	0
cl-arg-S400, ts	0003	0.53		ARG		0.12				CL	ZF-D	N		0.35	0.58	0.68	0
cl-air-cl, al	0004	0.53		AIR						CL	A1-D	N		0.55	0.64	0.70	0
cl-air-cl, sl	0005	0.53		AIR						CL	SS-D	N		0.54	0.64	0.70	0
cl-air-cl, ts	0006	0.53		AIR						CL	ZF-D	N		0.52	0.64	0.70	0
SB70xl-kry-cl-kry-SB70XL, tal	0007	0.53	0.53	KRY	KRY	0.02			0.02	CL	A1-D	N		0.24	0.22	0.41	0
SB70xl-kry-cl-kry-SB70XL, tsl	0008	0.53	0.53	KRY	KRY	0.02			0.02	CL	SS-D	N		0.22	0.22	0.41	0
SB70xl-kry-cl-kry-SB70XL, tts	0009	0.53	0.53	KRY	KRY	0.02			0.02	CL	ZF-D	N		0.20	0.22	0.41	0
cl-arg-cl-arg-S400, tal	0010	0.53	0.53	ARG	ARG				0.12	CL	A1-D	N		0.31	0.50	0.61	0
cl-arg-cl-arg-S400, tsl	0011	0.53	0.53	ARG	ARG				0.12	CL	SS-D	N		0.30	0.50	0.61	0
cl-arg-cl-arg-S400, tts	0012	0.53	0.53	ARG	ARG				0.12	CL	ZF-D	N		0.28	0.50	0.61	0
cl-air-cl-air-cl, tal	0013	0.53	0.53	AIR	AIR					CL	A1-D	N		0.40	0.56	0.63	0
cl-air-cl-air-cl, tsl	0014	0.53	0.53	AIR	AIR					CL	SS-D	N		0.39	0.56	0.63	0
cl-air-cl-air-cl, tts	0015	0.53	0.53	AIR	AIR					CL	ZF-D	N		0.37	0.56	0.63	0
SB70xl-kry-SG400, al	0016	0.53		KRY		0.02		0.12		CL	A1-D	N		0.31	0.24	0.55	0
SB70xl-kry-SG400, sl	0017	0.53		KRY		0.02		0.12		CL	SS-D	N		0.29	0.24	0.55	0
SB70xl-kry-SG400, ts	0018	0.53		KRY		0.02		0.12		CL	ZF-D	N		0.27	0.24	0.55	0

* 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 # :	855 875 Window Wall	Report number:	WIN14460w
Operator Type:	CSSV	Date:	12/24/2014
Model Size:	2000 x 2000	Revised Date:	
		Rating Procedure:	2014

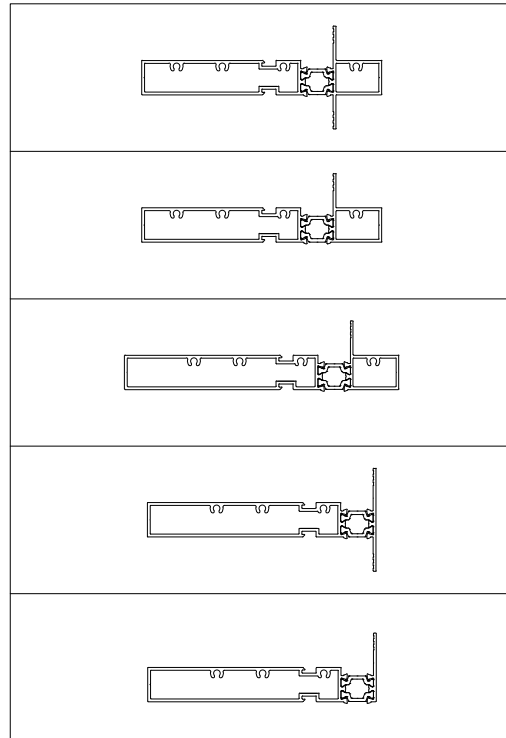
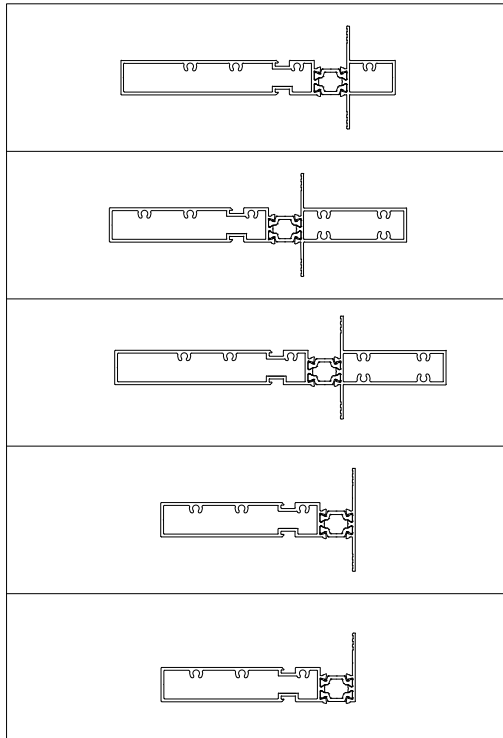
Exterior Frame		
Product Description	U-Factor (Btu/ h* ft² F)	Group Leader
Long E	0.200	Yes
Short E	0.198	No
Flat E	0.195	No

Interior Frame		
Product Description	U-Factor (Btu/ h* ft² F)	Group Leader
Long	0.195	Yes
Short	0.191	No

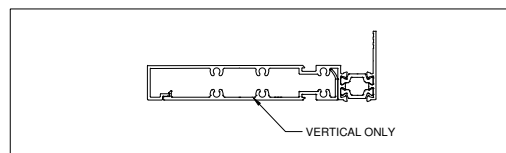
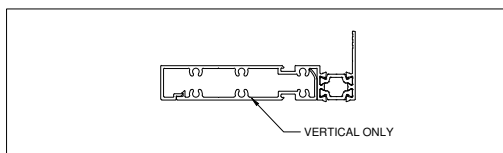
APPENDIX B

Product Drawings

INTERMEDIATE



COUPLING MULLION

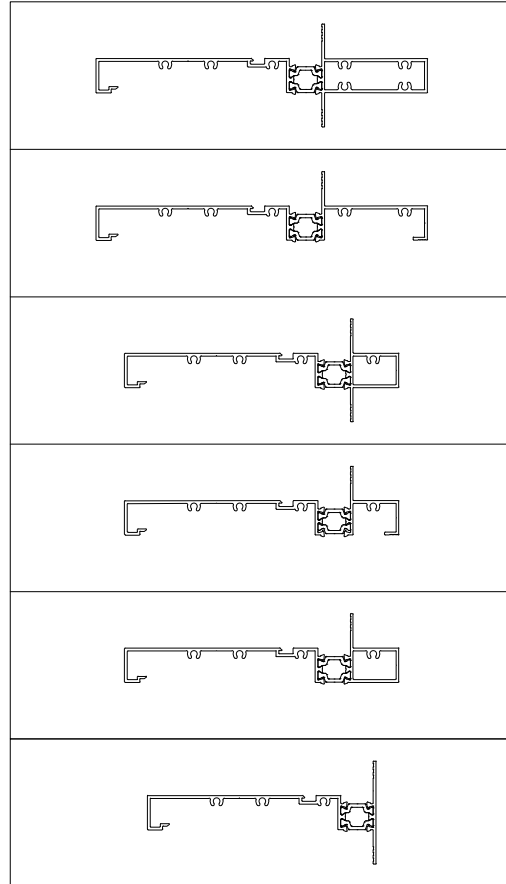
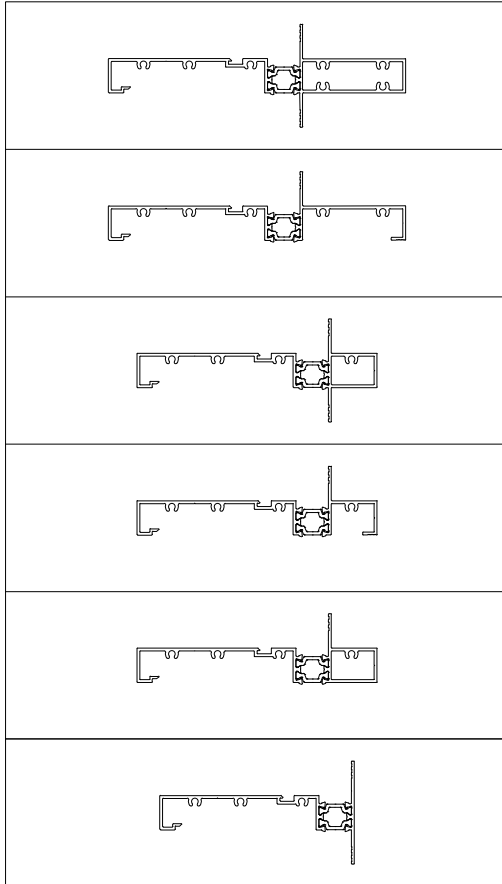


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SEPTEMBER 2014

PERIMETER



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