MMM GROUP

ANSI/NFRC 100

Procedure for Determining Fenestration Product U-factors

ANSI/NFRC 200

Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

NFRC 500

Procedure for Determining Fenestration Product Condensation Resistance Values

Fenestration Simulation Report

655 Window Wall

Report Number

WIN16019w

Tuesday, February 09, 2016

Prepared For

Oren Anava

Windspec Inc.

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Manufacturer:	Windspec Inc.
Report Number:	WIN16019w
Product Line:	655 Window Wall
Frame:	Thermally Broken Aluminum
Sash:	NA
Thermal Break:	P
Edge of Glass:	Interior and exterior edges are held by EPDM gaskets.
Glazing:	6mm Generic Clear glass (Cl), 6mm PPG Solarban 60 (SB60), 90% argon 10% Air fill (arg).
Spacer:	Superspacer Triseal with silicone secondary seal (ts).
Weatherstripping:	NA
General:	This product line includes the 655 Window Wall manufactured by Windspec Inc.

Tyler McPherson

Digitally signed by Tyler McPherson
DN: cn=Tyler McPherson, o=MMM Group, ou=Fenestration Services, email=mcphersont@mmm.ca, c=CA
Date: 2016.02.09 16:19:21 -05'00'

Tyler McPherson
Simulator

Michael Barclay

Digitally signed by Michael Barclay
DN: cn=Michael Barclay, o=MMM Group Ltd, ou=Fenstration Services, email=barclaym@mmm.ca, c=CA
Date: 2016.02.10 10:19:32 -05'00'

Simulator in Responsible Charge

The windows documented in this report were simulated in accordance with the ANSI/NFRC 100: Procedure for Determining Fenestration Product U-Factors (2014), ANSI/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 ANSI/NFRC 100 and ANSI/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

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 ANSI/NFRC 100, ANSI/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 "ANSI/NFRC 100: Procedure for Determining Fenestration Product U-Factors" Certification Report.

2 This is an "ANSI/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 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).

NFRC - U-Value Baseline Product

Manufacturer: Windspec Inc.

Product line: 655 Window Wall

Product Type: GWWW

Frame: Thermally Broken Aluminum

Report number: WIN16019w

Date: 2/9/2016

Revised date:

CPD:

Mfr contact: Oren Anava

Simulator in Responsibe Charge:

IA Name:

Product Description	SB60-arg-Cl, ts
Glass Thick 1 (in)	0.223
Glass Thick 2 (in)	0.225
Glass Thick 3 (in)	
Glass Thick 4 (in)	
Glass Thick 5 (in)	
# of Glazing Layers	2
Surface #2 Emissivity	0.03
Surface #3 Emissivity	
Surface #4 Emissivity	
Surface #5 Emissivity	
Surface #6 Emissivity	
Surface #7 Emissivity	
Surface #8 Emissivity	
Gap 1	0.528
Gap 2	
Gap 3	
Gap 4	
Validation Size	2000 x 2000 mm
	78.74 x 78.74 in
Spacer Type	ZF-D
Grid	N
Gap Fill	Air (10%) / Argon (90%) Mix
U-Value	0.32

ID	Name	No. of Layers	Mode	Tilt	Environmental Conditions	Keff (Btu/h*ft*F)	Overall Thickness (in)	Uval (Btu/h*ft²F)	SHGC	Visible Transmittance
13	SB60-arg-Cl	2	#	90	NFRC 100-2010	0.015	1.000	0.246	0.386	0.702

NFRC Simulation Data – Summary

Manufacturer: Windspec Inc.
Series/Model #: 655 Window Wall

Spacer: Superspacer Triseal with silicone secondary seal (ts).

Operator Type:	GWWW	Sim Lab Code:	SEEL
Model Size:	2000 x 2000	Report number:	WIN16019w
Thermal Break:	P	Date:	2/9/2016
		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
SB60-arg-Cl, ts	0001	0.53		ARG		0.03				CL	ZF-D	N		0.32	0.35	0.62	53

*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.

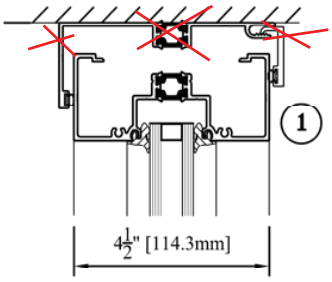
APPENDIX A

Product Drawings

PAGE
655–003

655 SERIES

TYPICAL DETAILS



Head

WINDSPEC INC.
MANUFACTURERS OF HIGH PERFORMANCE 'WINDSPEC' WINDOWS
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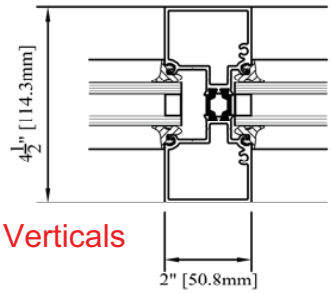
DECEMBER 2015

PAGE
655–002

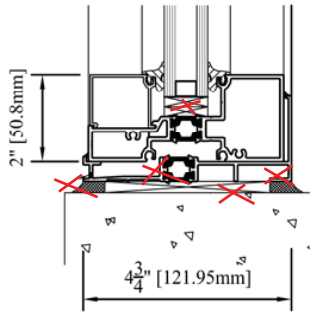
655 SERIES

TYPICAL DETAILS



Verticals

Sill



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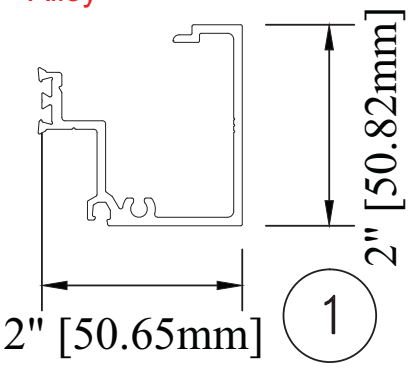
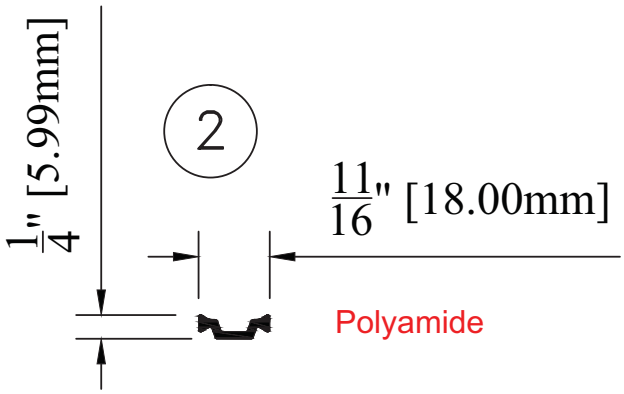
655 SERIES

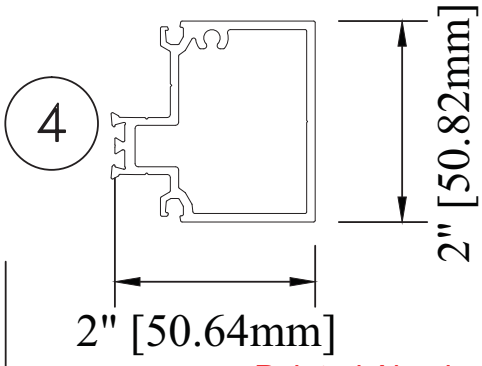
Painted Aluminum Alloy



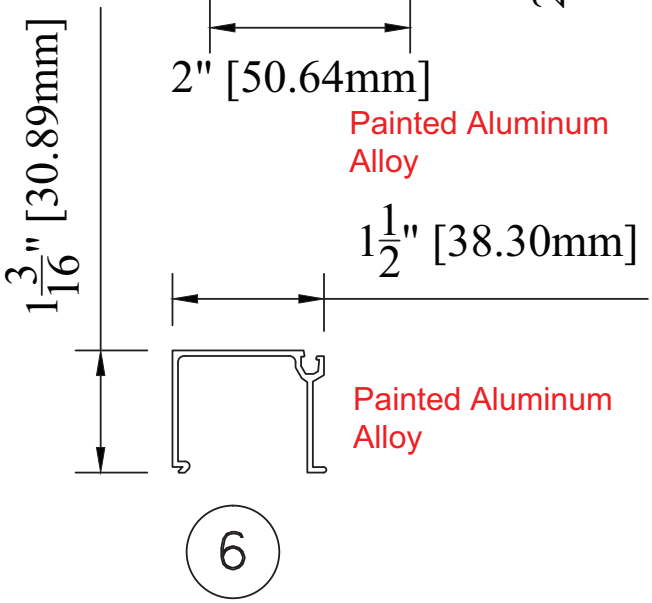


EPDM

Painted Aluminum Alloy



Painted Aluminum Alloy



Painted Aluminum Alloy

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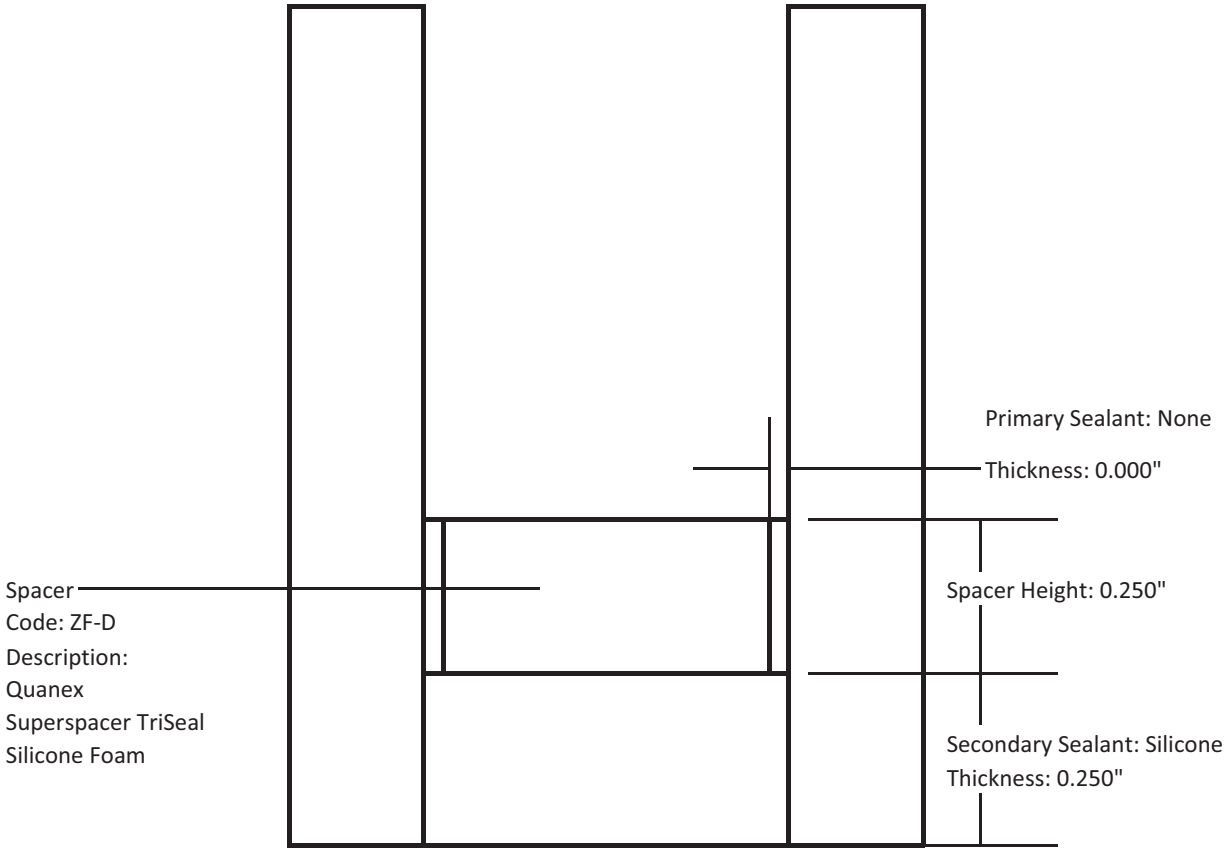
Primary Sealant: None
Thickness: 0.000"
Spacer
Code: ZF-D
Description:
Quanex
Superspacer TriSeal
Silicone Foam
Spacer Height: 0.250"
Secondary Sealant: Silicone
Thickness: 0.250"