



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

5500HTP Curtain Wall

Report Number

WIN14120w-b

Monday, May 05, 2014

Prepared For

Oren Anava

Windspec Inc.

1310 Creditstone Road

Concord, Ontario

L4K 5T7

TABLE OF CONTENTS

--	--

PG.	TITLE
3	Product Line Description
4	Report Information
5	Simulation Notes
6	Validation Product
7	Glazing Library for Manufacturer
8	NFRC Simulation Data
9	Appendix A Product Drawings

Manufacturer: Windspec Inc.

Report Number: WIN14120w-b

Product Line: 5500HTP Curtain Wall

Frame: Thermally Broken Aluminum

Sash: None

Thermal Break: PVC and Polyamide

Edge of Glass: The glazing is held by flexible boots.

Glazing: Double glazing, 25mm overall with 6mm glass. Solarban60 on surface 2 with 90% Argo

Spacer: ss = Foam Super Spacer

Weatherstripping: N/A

Simulations: Performed using WINDOW 6, and THERM 6.

General: This product line includes the 5500HTP Curtain Wall manufactured by Windspec Inc.

A separate product was simulated for validation purposes only. This product included the full framing at the perimeter. This configuration is not used for rating purposes. See page 8 for NFRC rated U-Factor, SHGC and VT.


Michael Barclay
Digitally signed by
barclaym@mmm.ca
DN:
cn=barclaym@mmm.ca
Date: 2014.05.05
13:32:14 -04'00'

Michael Barclay, P.Eng.
Simulator


Michael Barclay
Digitally signed by
barclaym@mmm.ca
DN:
cn=barclaym@mmm.ca
Date: 2014.05.05 13:32:25
-04'00'

Michael Barclay, P.Eng.
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 (2010), NFRC 200: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence (2010) and NFRC 500: Procedure for Determining Fenestration Product Condensation Resistance Values (2010).

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.

DISCLAIMER:

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

No part of this report may be reproduced except in full, without the written consent of MMM Group Ltd.

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 Thermally bridging hardware, including pressure plate screws was simulated with the Isothermal Planes Method. All non-continuous hardware that does not create a thermal bridge is not modeled.

NFRC - U-Value Baseline Product

Manufacturer: Windspec Inc.

Product line: 5500HTP Curtain Wall

Product Type: DDSG

Frame: Thermally Broken Aluminum

Mfr contact: Oren Anava

Simulator in
Responsible
Charge: Michael Barclay,
P.Eng.

IA Name:

Report number: WIN14120w-b

Date: 5/5/2014

Revised date:

CPD:

Product Description	SB60-arg-cl, vss		
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*ft² F)	Overall Thickness (in)	Uval (Btu/h* ft² F)	SHGC	Visible Transmittance
1	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 #: 5500HTP Curtain Wall

Spacer: ss = Foam Super Spacer

Operator Type: DDSG Sim Lab Code: SEEL
Model Size: 2000 x 2000 Report number: WIN14120w-b
Thermal Break: PVC and Polyamide Date: 5/5/2014
Revised Date:
Rating Procedure: 2010

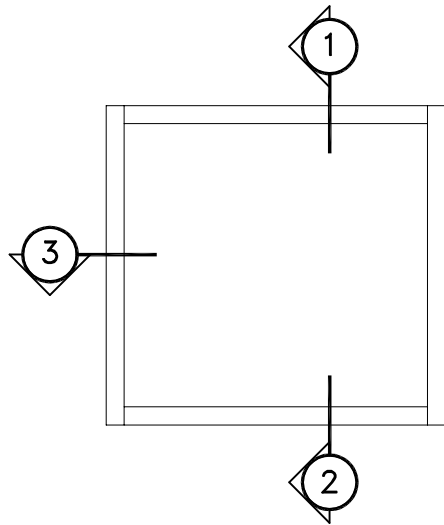
Mfr Product Code	Product Number	Gap 1 (in)	Gap 2 (in)	Gap Fill 1	Gap Fill 2	Emissivity Surface 2	Emissivity Surface 3	Emissivity Surface 4	Emissivity Surface 5	Tint	Spacer	Grid Type	Grid Size	U-Factor (Btu/h*ft²F)	SHGC	VT	*CR
SB60-arg-cl, ss	0001	0.53		ARG		0.03				CL	ZF-D	N		0.32	0.35	0.63	0

* 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.

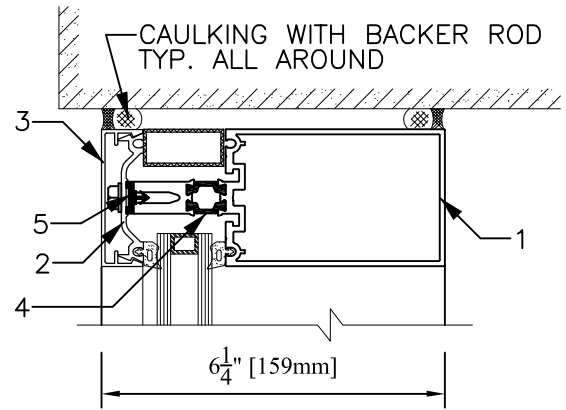
APPENDIX A

Product Drawings

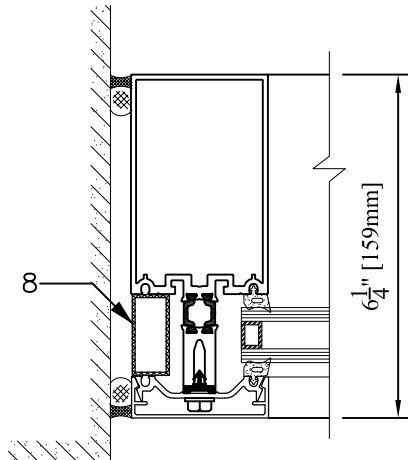
5500 HTP SERIES CURTAINWALL



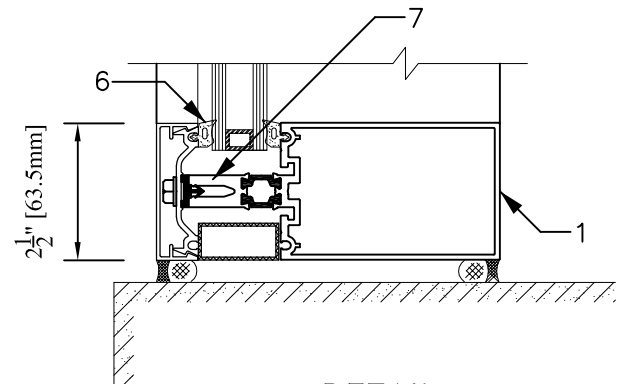
ELEVATION



1 DETAIL



3 DETAIL



2 DETAIL

#	DIE #	DESCRIPTION
1	N/A	NEW ALUM. HTP MULLION
2	N/A	NEW ALUM. PRESSURE PLATE
3	C-55004	ALUM. SNAP-ON CAP
4	N/A	BAUTEC STRIP NYLON 18mm WIDE
5	N/A	FLEXIBLE PVC THERMAL BREAK
6	N/A	EPDM GASCKET
7	N/A	NEW ALUM. NECK
8	N/A	PVC POCKET FILLER



WINDSPEC INC.

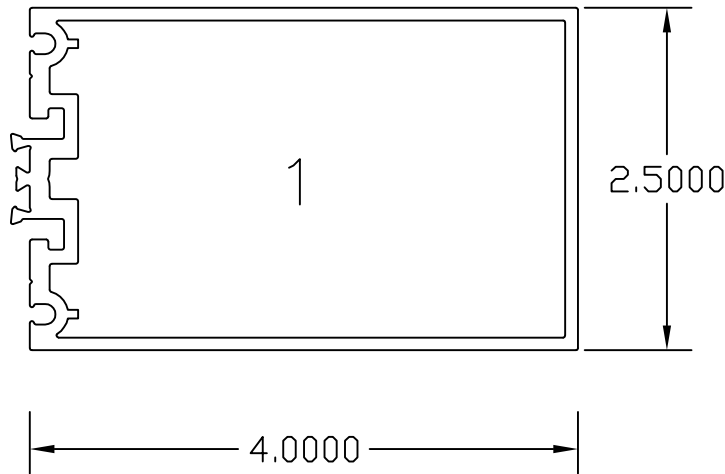
MANUFACTURERS OF HIGH PERFORMANCE 'WINDSPEC' WINDOWS
ALUMINUM ENTRANCE SYSTEMS AND ARCHITECTURAL PANELS
1310 CREDITSTONE RD, CONCORD, ONTARIO L4K 5T7
Telephone (905) 738 - 8311 Fax (905) 738 - 6188

SCALE : NTS

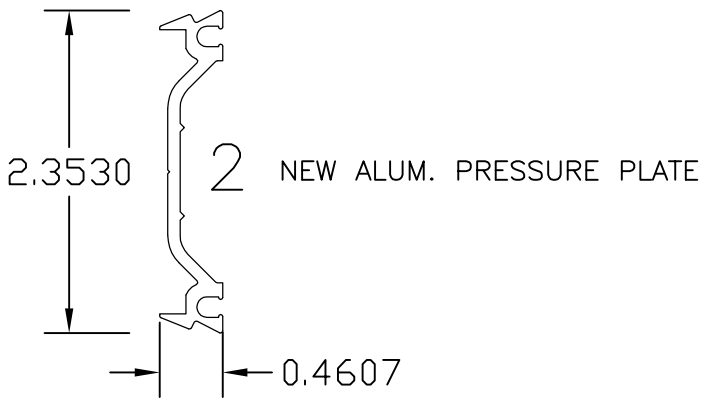
DESCRIPTION :
5500 HTP SERIES FIXED TRIPLE GLAZED WINDOW

DRAWING NO. :
001

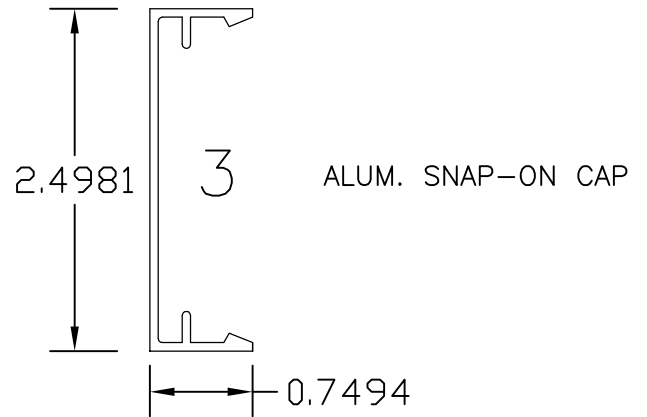
5500 HTP SERIES CURTAINWALL PARTS



NEW ALUM. HTP MULLION



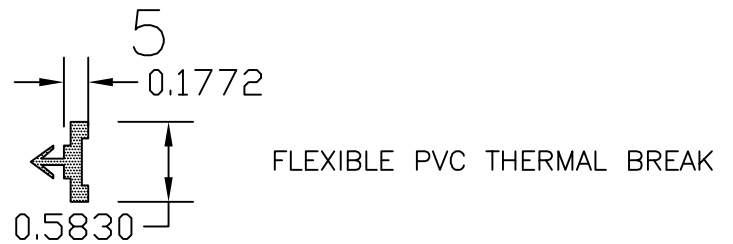
NEW ALUM. PRESSURE PLATE



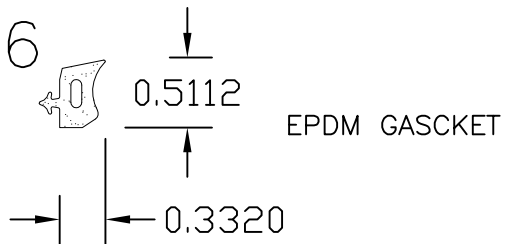
ALUM. SNAP-ON CAP



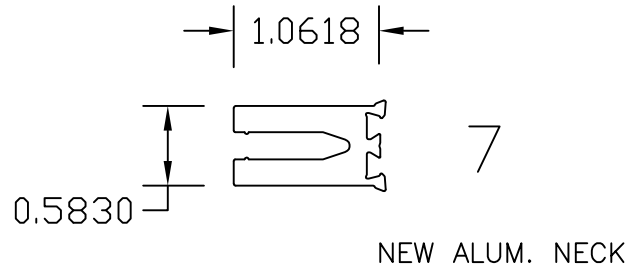
BAUTEC STRIP NYLON 18mm WIDE



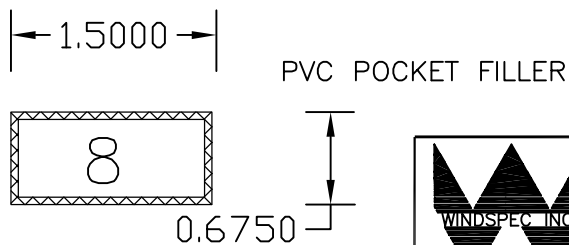
FLEXIBLE PVC THERMAL BREAK



EPDM GASCKET



NEW ALUM. NECK



PVC POCKET FILLER



WINDSPEC INC.

MANUFACTURERS OF HIGH PERFORMANCE 'WINDSPEC' WINDOWS
ALUMINUM ENTRANCE SYSTEMS AND ARCHITECTURAL PANELS
1310 CREDITSTONE RD, CONCORD, ONTARIO L4K 5T7
Telephone (905) 738 -8311 Fax (905) 738 - 6188

SCALE : NTS

DESCRIPTION :
5500 HTP SERIES FIXED TRIPLE GLAZED WINDOW

DRAWING NO. :
002