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NFRC Accredited Computer Modeling & Simulation Laboratory

NFRC THERMAL SIMULATION REPORT

U-Factor (ANSI/NFRC 100-2017), CR (NFRC 500-2014) SHGC and VT (ANSI/NFRC 200-2017)

Fenestration Product: Vinyl Fixed Window

Report#: SIM13F-042-3

Series#: Venetian S-3850 PW

Submitted To: Rey Nea

Manufacturer: GREEN WORLD WINDOWS

Address: 4195 Chino Hills Parkway, Ste. 508, Chino Hills, CA 91709

Phone#: (909) 923-8618

Baseline Product:

This is a simple addendum report to original simulation report# SIM13F-042, prepared on 01/17/2014 by FSE. Revised to add "SB90 Low-e glass. No other changes were made per client. For baseline product detail, refer to original sim report# SIM13F-042. No additional validation test required.

Baseline Simulation Date: 01/17/2014

Expiration Date: Five years from the date of the oldest physical test

conducted for the latest certification ratings

Revision Date: 08/10/2017

Product Type: Fixed

Simulator: Anis Jan

Simulator-in-Charge: Anis Jan

Simulation Method: Approved NFRC software THERM7 and WINDOW7

and NFRC WINDOW/THERM simulation manual

Series#: Venetian S-3850 PW Report#: SIM13F-042-3
Product: Vinyl Fixed Window Report Date: 08/10/2017

Model/Type: FIXD

Size: {1200 mm x 1500 mm} / [47 in x 59 in]

Frame Type and Finish: Vinyl- rigid PVC

Sash Type and Finish: Not Applicable (pvc glazing bead)

IG Glass Parameters: See glazing matrix, for detail info. on glass.

Glazing Method: Glass is wet glazed onto silicone sealant from

exterior, with PVC glazing bead applied full perimeter

from exterior.

Gas Fill Method: Argon 90% & Air 10% gas fill using Evacuated

chamber fill technique.

Spacers: A8-D = supersure seal spacer II, dual sealed with hot

melt butyl (with rigid PVC strip for both strips, per

client) and

A8-D = supersure seal spacer regular, dual sealed with hot melt butyl (with rigid PVC on top strip and corrugated aluminum-mill finish for bottom strip, per

client.

Dividers: Aluminum painted exterior/ mill finish interior

Rectangular grid: 0.188" x 0.625" x 0.02" (<1, 0.75 grid size), and Contour grid: 0.313" x 0.984" x 0.02"

(<1, 0.75 grid size).

Grid pattern: NFRC Standard

Grouping:

Center-of-Glazing: Yes, NFRC Rules for grouping (see summary tables)

Frame: Yes, see original report SIM13F-042.

Spacer: No

Divider: No

Miscellaneous:

SHGC and VT: Default Frame Absorptivity 0.3, per ANSI/NFRC 200-2017

Sec. 4.5.D.

Series#: Venetian S-3850 PW Report#: SIM13F-042-3
Product: Vinyl Fixed Window Report Date: 08/10/2017

Glazing Matrix

GIZ ID	Name	Group	ucog	Thick.	ID1	Gap fill1	ID2	Gapfill2	ID2
5	SB90 / AIR / CLEAR - (SS-SS)	L1	0.291	0.697	5443	AIR	5008		
6	SB90 / AIR / CLEAR - (DS-DS)	1	0.29	0.736	5444	AIR	5009		
9	SB90 / AIR / SB90 / AIR / CLEAR - (SS-SS-SS)	L2	0.197	1.045	5443	AIR	5443	AIR	5008
10	SB90 / AIR / SB90 / AIR / CLEAR - (DS-DS-DS)	2	0.196	1.104	5444	AIR	5444	AIR	5009
16	SB90 / ARG / CLEAR - (SS-SS)	L3	0.243	0.697	5443	ARG(90)	5008		
17	SB90 / ARG / CLEAR - (DS-DS)	3	0.243	0.736	5444	ARG(90)	5009		
20	SB90 / ARG / SB90 / ARG / CLEAR - (SS-SS-SS)	L4	0.154	1.045	5443	ARG(90)	5443	ARG(90)	5008
21	SB90 / ARG / SB90 / ARG / CLEAR - (DS-DS-DS)	4	0.154	1.104	5444	ARG(90)	5444	ARG(90)	5009
50	SB70 / ARG / SB70 / ARG / CLEAR - (SS-SS-SS)	L50	0.153	1.045	5431	ARG(90)	5431	ARG(90)	5008

Note: L denotes the group leader per ANSI/NFRC 100-2017.

SHGC 0 and 1 & VT 0 and 1

	No-divider	Divider < 25.4 mm	Divider >= 25.4 mm
SHGC0	0.004016	0.006799	0.009423
SHGC1	0.801075	0.718434	0.640475
VT0	0	0	0
VT1	0.797058	0.711636	0.631052

SHGC & VT "0 and 1" values were used from original simulation report SIM14F-042, per TI-2010-001.

SHGC = SHGC0 + SHGCc * (SHGC1 - SHGC0) VT = VT0 + VTc * (VT1 - VT0)

SHGCc = center of glass SHGC value only VTc = center of glass VT value only

Series#: Venetian S-3850 PW Product: Vinyl Fixed Window

U-Factor, SHGC & VT Values Report#: SIM13F-042-3 Report Date: 08/10/2017

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																Lab (Code:		SFSE					
		Operator Type:				FIXI) 201	4 Mode	l Size:	1200 mm x 1500 mm						Repo	rt#:		SIM13F-042-3					
Mfr Name:	GREEN WORLD WINDOWS	Frame Type:			VY	Res	sidentia	l Size:							Rpt a	late:		1/17/2014						
Series/Model#: Venetian S-3850 PW		71				N						1						evision dat	(08/10/2017				
						N										Frai	ne Ab	sorptance.	:	(0.3			
										<u> </u>					_		ocedure:			2014				
															T 1	7 141		1			2017			
	. Code	Product Num	Thick. 1	Thick. 2	Thick. 3									Туре		9	boo	Б Б		U-factor	SHGC		<u>م</u>	
	ğ	털	₽	Ę	⊨	_	٥,	s 1	s 2	s 3	s 4	s 5	9 s	Б		Size	tōr	ő	Goo			5	꽁	
	Ę.	ģ	Pane	Pane	Pane	д Т	Gap 2	Emiss 1	Emiss	Emiss	Emiss 4	Emiss	Emiss	äĊ	<u>.</u>	Grid	factor	SHGC cog	.8	Total	Total	Total	Total	
	ž	Ÿ.	Ъа	Ъа	Ра	Gap	Ğ	ᇤ	ᇤ	ᇤ	E	ᇤ	ᇤ	Spacer	Grid	G)	Ϋ́	>	l e	₽	P	유	
CDOO / AID / CL EAD	(00.00)	004	0.000	0.000		0.500			0.000								0.00	0.000077	0.504474	0.00	0.40	0.40	57	
SB90 / AIR / CLEAR		001	0.098	0.098		0.500			0.023					A8-D A8-D	N	0.75		0.230377	0.531174	0.30	0.19	0.42	57	
SB90 / AIR / CLEAR	- (SS-SS) – rectangular grid	001-0001 001-0002		0.098	-	0.500			0.023					A8-D	N	0.75		0.231486		1		0.36	+	
	- (DS-DS) - (DS-DS) – rectangular grid		0.118	0.118	1	0.500								-		0.75		0.231486		1	0.19		+	
SB90 / AIR / CLEAR	- (DS-DS) - rectangular grid	001-0003	0.116	0.118	-	0.500			0.023					A6-D	G	0.75	0.29	0.231466	0.524806	1	0.17	0.37	+	
SDOO / AID / CLEAD	- (SS-SS) contour grid	002	0.098	0.098		0.500			0.023					10 D	_	0 7E	0.20	0.220277	0.531174	0.22	0.17	0.38	57	
	- (DS-DS) contour grid - (DS-DS) contour grid	002-0001		0.098	-	0.500			0.023									0.231486		0.32	0.17	0.36	57	
3D90 / AIR / CLEAR	- (D3-D3) Contour grid	002-0001	0.116	0.116		0.300			0.023					Ao-D	G	0.75	0.29	0.231400	0.324606		0.17	0.37	+	
SBOO / AID / SBOO / A	AIR / CLEAR - (SS-SS-SS)	003	0.098	0.098	0.098	0.500	0.250		0.023		0.023			A8-D	N		0.20	0.175272	0.314613	0.22	0.14	0.25	67	
	AIR / CLEAR - (SS-SS-SS) – rectangular grid	003-0001	0.098	0.098	0.098		0.250		0.023		0.023					0.75		0.175372		0.23	0.14	0.23	-07	
	AIR / CLEAR - (03-03-33) - rectangular grid	003-0001	0.038		0.038		0.250		0.023		0.023			A8-D		0.73		0.176338			0.13	0.25	+	
	AIR / CLEAR - (DS-DS-DS) – rectangular grid	003-0002	0.118		0.118	0.500	0.250		0.023		0.023			A8-D		0.75			0.308952		0.14	0.23	+	
3B30 / AIR / 3B30 / F	RIK / CLEAR - (D3-D3-D3) - Tectaligulal gliu	003-0003	0.110	0.110	0.110	0.300	0.230		0.023		J.U23			AO-D	G	0.73	0.20	0.170336	0.300932		0.13	0.22	+	
SROO / AIR / SROO / A	AIR / CLEAR - (SS-SS-SS) contour grid	004	0.098	0.098	0.098	0.500	0.250		0.023	(0.023			A8-D	G	0.75	0.20	0 175372	0.314613	0.23	0.13	0.22	67	
	AIR / CLEAR - (DS-DS-DS) contour grid	004-0001	0.038		0.038		0.250		0.023		0.023			A8-D				0.176338		0.23	0.13	0.22	-07	
3B30 / AIR / 3B30 / F	RIK / CLEAR - (D3-D3-D3) Contour grid	004-0001	0.110	0.116	0.116	0.300	0.230		0.023		3.023			AO-D	G	0.73	0.20	0.170336	0.300932		0.13	0.22	+-	
SB90 / ARG / CLEAR	2 - (22-22)	005	0.098	0.098		0.500			0.023					A8-D	NI		0.24	0 225516	0.531174	0.26	0.18	0.42	61	
	R - (SS-SS) – rectangular grid	005-0001	0.098	0.098		0.500			0.023					A8-D		0.75		0.225516		0.20	0.17	0.38	101	
SB90 / ARG / CLEAR		005-0001	0.118	0.118		0.500			0.023					A8-D	N	0.75	0.24	0.226010			0.17	0.42	+	
	R - (DS-DS) – rectangular grid	005-0002	0.118	0.118		0.500			0.023							0.75		0.226010			0.17	0.42	+	
SB307 ANG 7 CLLAN	(1-(D3-D3) - rectangular grid	003-0003	0.110	0.110		0.500			0.023					A0-D	0	0.75	0.24	0.220010	0.024000		0.17	0.57	+	
SROO / ARG / CLEAR	? - (SS-SS) contour grid	006	0.098	0.098		0.500			0.023					A8-D	G	0.75	0.24	0 225516	0.531174	0.28	0.17	0.38	61	
	R - (DS-DS) contour grid	006-0001		0.118		0.500			0.023									0.226010		0.20	0.17	0.37	101	
OBSOT ANOT OLLAN	(DO DO) CONTOUR GITU	000 0001	0.110	0.110		0.000			0.020					710 D	Ŭ	0.70	0.24	0.220010	0.024000		0.17	0.07	+ 1	
SR90 / ARG / SR90 /	ARG / CLEAR - (SS-SS-SS)	007	0.098	0.098	0.098	0.500	0.250		0.023	(0.023			A8-D	N		0 15	0 172448	0.314613	0.19	0.14	0.25	71	
	ARG / CLEAR - (SS-SS-SS) – rectangular grid	007-0001	0.098	0.098	0.098		0.250		0.023		0.023					0.75		0.172448		00	0.13	0.22	+	
	ARG / CLEAR - (DS-DS-DS)	007-0002	0.118		0.118	0.500	0.250		0.023		0.023			A8-D		0.10		0.172886			0.14	0.25	+-	
	ARG / CLEAR - (DS-DS-DS) – rectangular grid	007-0003	0.118		0.118	0.500	0.250		0.023		0.023					0.75		0.172886	0.308952		0.13	0.22	+	
OBOOT THEO TO BOOT	71107 GEE711 (BG BG BG) TOOLGINGUIGI GITG	007 0000	0.110	0.110	0.110	0.000	0.200		0.020		0.020			710 D	Ŭ	0.10	0.10	0.1172000	0.000002		0.10	U.LL	+-	
SB90 / ARG / SB90 /	ARG / CLEAR - (SS-SS-SS) contour grid	008	0.098	0.098	0.098	0.500	0.250		0.023	(0.023			A8-D	G	0.75	0 15	0 172448	0.314613	0.20	0.13	0.22	71	
	ARG / CLEAR - (DS-DS-DS) contour grid	008-0001	0.118	0.118			0.250		0.023		0.023								0.308952	0.20	0.13	0.22	 	
020077	7.11.0 ; 0.12.7 11. (2.0.2.0 2.0 ; 0.0.110 11. g.111		01110	01110	01110	0.000	0.200		0.020		0.020			7.0 2	_	01.0	00	01112000	0.000002		00		_	
SB90 / AIR / CLEAR	- (SS-SS)	009	0.098	0.098		0.500			0.023					A8-D	N		0.29	0.230377	0.531174	0.29	0.19	0.42	60	
	- (SS-SS) – rectangular grid	009-0001	0.098	0.098		0.500			0.023					A8-D		0.75		0.230377			0.17	0.38	1	
SB90 / AIR / CLEAR		009-0002	0.118	0.118		0.500			0.023					A8-D				0.231486			0.19	0.42		
	- (DS-DS) – rectangular grid	009-0003	0.118	0.118		0.500			0.023									0.231486			0.17	0.37		
	, ., y y	1	1	1		1	1								Ħ					1		1		
SB90 / AIR / CLEAR	- (SS-SS) contour grid	010	0.098	0.098		0.500	1		0.023					A8-D	G	0.75	0.29	0.230377	0.531174	0.31	0.17	0.38	60	
	- (DS-DS) contour grid	010-0001	0.118			0.500			0.023									0.231486			0.17	0.37		
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U-Factor, SHGC & VT Values

Series#: Venetian S-3850 PW Report#: SIM13F-042-3 Report Date: 08/10/2017 **Product: Vinyl Fixed Window**

- readed ranger block random																					
Mfr Prod. Code	Product Num	Pane Thick. 1	Pane Thick. 2	Pane Thick. 3	Gap 1	Gap 2	Emiss 1	Emiss 2	Emiss 3	Emiss 4	Emiss 5	Emiss 6	Spacer Type	Grid Grid Size	U factor cog	SHGC cog	VT cog	Total U-factor	Total SHGC	Total VT	Total CR
SB90 / AIR / SB90 / AIR / CLEAR - (SS-SS-SS)	011	0.098	0.098	0.098	0.500	0.250		0.023		0.023		A	1 D-8	J	0.20	0.175372	0.314613	0.21	0.14	0.25	71
SB90 / AIR / SB90 / AIR / CLEAR - (SS-SS-SS) - rectangular grid	011-0001	0.098	0.098	0.098	0.500	0.250		0.023		0.023		A	3-D (0.75	0.20	0.175372	0.314613		0.13	0.22	
SB90 / AIR / SB90 / AIR / CLEAR - (DS-DS-DS)	011-0002	0.118	0.118	0.118	0.500	0.250		0.023		0.023		A	1 D-8	1	0.20	0.176338	0.308952		0.14	0.25	
SB90 / AIR / SB90 / AIR / CLEAR - (DS-DS-DS) - rectangular grid	011-0003	0.118	0.118	0.118	0.500	0.250		0.023		0.023		A	3-D (0.75	0.20	0.176338	0.308952		0.13	0.22	
SB90 / AIR / SB90 / AIR / CLEAR - (SS-SS-SS) contour grid	012	0.098	0.098	0.098	0.500	0.250		0.023		0.023		A	3-D (0.75	0.20	0.175372	0.314613	0.22	0.13	0.22	71
SB90 / AIR / SB90 / AIR / CLEAR - (DS-DS-DS) contour grid	012-0001	0.118	0.118	0.118	0.500	0.250		0.023		0.023		A	3-D (0.75	0.20	0.176338	0.308952		0.13	0.22	
SB90 / ARG / CLEAR - (SS-SS)	013	0.098	0.098		0.500			0.023					1 D-8		0.24	0.225516	0.531174	0.25	0.18	0.42	64
SB90 / ARG / CLEAR - (SS-SS) - rectangular grid	013-0001	0.098	0.098		0.500			0.023						0.75		0.225516			0.17	0.38	
SB90 / ARG / CLEAR - (DS-DS)	013-0002	0.118	0.118		0.500			0.023					1 D-8						0.18	0.42	
SB90 / ARG / CLEAR - (DS-DS) - rectangular grid	013-0003	0.118	0.118		0.500			0.023				A	3-D (0.75	0.24	0.226010	0.524806		0.17	0.37	
																			<u> </u>		
SB90 / ARG / CLEAR - (SS-SS) contour grid	014		0.098		0.500			0.023							_			0.27	0.17	0.38	64
SB90 / ARG / CLEAR - (DS-DS) contour grid	014-0001	0.118	0.118		0.500			0.023				A	3-D (0.75	0.24	0.226010	0.524806		0.17	0.37	
																			<u> </u>	<u> </u>	
SB90 / ARG / SB90 / ARG / CLEAR - (SS-SS-SS)	015		0.098	0.098		0.250		0.023		0.023			1 D-8			0.172448			0.14	0.25	76
	015-0001		0.098	0.098	0.500	0.250		0.023		0.023				0.75		0.172448			0.13	0.22	
SB90 / ARG / SB90 / ARG / CLEAR - (DS-DS-DS)	015-0002		0.118	0.118	0.500	0.250		0.023		0.023			1 D-8			0.172886			0.14	0.25	
SB90 / ARG / SB90 / ARG / CLEAR - (DS-DS-DS) – rectangular grid	015-0003	0.118	0.118	0.118	0.500	0.250		0.023		0.023		A	3-D (0.75	0.15	0.172886	0.308952		0.13	0.22	
																			↓	↓	
SB90 / ARG / SB90 / ARG / CLEAR - (SS-SS-SS) contour grid	016		0.098	0.098		0.250		0.023		0.023						0.172448			0.13		76
SB90 / ARG / SB90 / ARG / CLEAR - (DS-DS-DS) contour grid	016-0001	0.118	0.118	0.118	0.500	0.250		0.023		0.023		A	3-D (0.75	0.15	0.172886	0.308952		0.13	0.22	

A8-D = supersureseal spacer, dual sealed with hot melt butyl

Product# 001 to 008 with supersure seal spacer regular (see page 2 for more detail) Product# 009 to 016 with supersure seal spacer II (see page 2 for more detail)

Series#: Venetian S-3850 PW Report#: SIM13F-042-3
Product: Vinyl Fixed Window Report Date: 08/10/2017

WINDOW SIMULATION REPORT:

The fenestration products documented in this report were simulated in accordance with the ANSI/NFRC 100-2017: Procedure for Determining Fenestration Product Thermal Performance & NFRC 500-2014. The fenestration products were simulated using computer programs Therm 7.4.4, Window 7.4.14 & Spectral Data #55.0 as specified in ANSI/NFRC 100-2017 and ANSI/NFRC 200-2017 (SHGC/VT). 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 fenestration product. 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.

DISCLAIMER:

This fenestration product simulation report was generated by Fenestration Simulation Engineering, Westminster, California. No part of the report may be reproduced except in full, without the express written consent of Fenestration Simulation Engineering. The report relates only to the items specified. Fenestration Simulation Engineering and its employees neither endorse nor warrant the suitability of the product simulated. Every effort was taken to accurately model the performance of the products documented in this report. Because of the large amount of input data and analysis, neither Fenestration Simulation Engineering nor any of its employees shall be responsible for any loss or damage resulting directly or indirectly from any default, error, or omission.

It is the policy for this laboratory to verify as much information about the product being tested and simulated. However, not all information provided to the laboratory can be verified, such as physical properties of low-e coating, heat mirror, gas fills spacer, and others. Therefore, all information provided to the laboratory is the manufacturer's responsibility as to its accuracy.

It is the policy of this laboratory to prepare a report and submit it to the manufacturer for his approval. Upon notification in writing from the manufacturer that he approves of the report, (in approving report, manufacturer takes responsibility of all information provided to this laboratory) the report is sent to the certification agency. The data shall be kept for a period of four years after which they may be destroyed.

Fenestration Simulation Engineering will not be responsible for inaccuracies in the information it has been provided.

- A. Simulations were conducted in full compliance with NFRC requirements.
- B. This report shall not be reproduced, except in full, without the approval of this laboratory.
- C. This report relates only to the fenestration products simulated.
- D. Rounding is per NFRC 601, NFRC Unit and Measurement Policy.
- E. 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.
- F. Name and signature of the individual performing the simulations and accepting the responsibility for the technical accuracy of this simulation report.

The data shall be kept for a period of five years after which they may be destroyed.

<u>Anis Jan</u>

Anis Jan Simulator-in-responsible-charge