

GUTMANN NORTH AMERICA COMPUTER SIMULATION REPORT

SCOPE OF WORK

S70+ FIXED WINDOW (25MM - DUAL GLAZED) - AAMA 507 SIMULATIONS TO DETERMINE U-FACTOR, SOLAR HEAT GAIN COEFFICIENT, AND VISIBLE TRANSMITTANCE RATINGS

REPORT NUMBER

L0395.01-116-45 R0

TEST DATE 05/27/20

ISSUE DATE 05/27/20

RECORD RETENTION END DATE 05/27/25

PAGES

DOCUMENT CONTROL NUMBER RT-R-AMER-Test-3753 (02/20/18) ©2017 INTERTEK





130 Derry Court York, PA, 17406

Telephone: 717-764-7700 Facsimile: 717-764-4129 www.intertek.com/building

TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

REPORT ISSUED TO

GUTMANN NORTH AMERICA 911-90 Queens Wharf Road Toronto, Ontario, Canada M5V 0J4

SECTION 1

SUMMARY

SERIES/MODEL: S70+ Fixed Window (25mm - Dual Glazed)

Intertek Building & Construction (Intertek B&C) was contracted to perform AAMA 507 computer simulations utilizing thermal modeling computer software developed by Lawrence Berkeley National Laboratory (LBNL). Results obtained are simulated values and were secured using the designated test methods.

Intertek B&C is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications.

This report does not constitute certification of this product nor an opinion or endorsement by this laboratory.

For INTERTEK B&C			
COMPLETED BY:	Allison M. Ford	REVIEWED BY:	Eric S. Leitner
			Manager - Thermal Testing
TITLE:	Simulation Technician	TITLE:	& Simulations
SIGNATURE:		SIGNATURE:	
DATE:	05/27/20	DATE:	05/27/20
AMF:amf			

This report is for the exclusive use of Intertek's Client and is provided pursuant to the agreement between Intertek and its Client. Intertek's responsibility and liability are limited to the terms and conditions of the agreement. Intertek assumes no liability to any party, other than to the Client in accordance with the agreement, for any loss, expense or damage occasioned by the use of this report. Only the Client is authorized to permit copying or distribution of this report and then only in its entirety. Any use of the Intertek name or one of its marks for the sale or advertisement of the tested material, product or service must first be approved in writing by Intertek. The observations and test results in this report are relevant only to the sample(s) tested. This report by itself does not imply that the material, product, or service is or has ever been under an Intertek certification program.



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 2

TEST METHODS

The products were evaluated in accordance with the following:

AAMA 507-15, Standard Practice for Determining the Thermal Performance Characteristics of Fenestration Systems Installed in Commercial Buildings

ANSI/NFRC 100-2017, Procedure for Determining Fenestration Product U-Factors

ANSI/NFRC 200-2017, Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence

SECTION 3

TEST PROCEDURE

The total product, including specific frame, spacer, and glass details, was modeled using NFRC approved software.

FRAME AND EDGE MODELING	THERM 7.4.4
CENTER-OF-GLASS MODELING	WINDOW 7.4.14
TOTAL PRODUCT CALCULATIONS	WINDOW 7.4.14
SPECTRAL DATA LIBRARY	IGDB 72.0

Modeling Assumptions / Technical Interpretations

Any modeling assumptions and technical interpretations required to model this product are listed below.

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) This product is available in either a painted or anodized finish. These two finish types may be grouped in accordance with ANSI/NFRC 100-2017, Section 4.2.1.L. The painted finish was simulated since it is the worst case (highest emissivity).



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 4

SIMULATION SPECIMEN DESCRIPTION

SERIES/MODEL	S70+ Fixed Window (25mm - Dual Glazed)
PRODUCT TYPE	Fixed, 4-Sided
FRAME MATERIAL	AT - Aluminum w/ Thermal Breaks - All Members
SASH MATERIAL	NA - Not Applicable

GLAZI	GLAZING OPTIONS								
	OUTER PANE	MIDDLE PANE	INNER PANE	GAP SIZES	IG OVERALL				
GL1	1/4"	N/A	1/4"	0.500"	1"				
GL2	1/4"	Heat Mirror	1/4"	0.250"	1"				

GL1: Dual glazed IG unit (COG=0.48 - COG=0.20) GL2: Dual glazed IG unit w/ heat mirror (COG=0.18 - COG=0.10)

SPACER OPTIONS			
ТҮРЕ	PRIMARY SEAL	SECONDARY SEAL	CODE
Generic Aluminum Dual Seal Spacer	Butyl Rubber	Butyl Rubber	A1-D

SECTION 5

MEASURED SIMULATION DATA

U-FACTOR CALCULATIONS	
Exterior Air Temperature	-0.4°F
Exterior Wind Velocity	12.3 mph (Perpendicular Flow)
Interior Air Temperature	69.8°F



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

U-FACTOR CALCULATIONS: System U-Factor vs. Percentage of Vision Area



Vision Area / Total Area (%)



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

SHGC CALCULATIONS: System SHGC vs. Percentage of Vision Area

COG SHGC



Vision Area / Total Area (%)

VT CALCULATIONS: System VT vs. Percentage of Vision Area







TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

U-FACTOR CALCULATIONS (S70+ Fixed Window (25mm - Dual Glazed))							
Size Specific U-Factor Matrix*							
Glazing Option	Center-of-Glass U-Factor	Overall U-Factor					
1	0.48	0.50					
2	0.46	0.48					
3	0.44	0.47					
4	0.42	0.45					
5	0.40	0.44					
6	0.38	0.42					
7	0.36	0.41					
8	0.34	0.39					
9	0.32	0.38					
10	0.30	0.36					
11	0.28	0.34					
12	0.26	0.33					
13	0.24	0.31					
14	0.22	0.30					
15	0.20	0.28					
16	0.18	0.26					
17	0.16	0.25					
18	0.14	0.23					
19	0.12	0.22					
20	0.10	0.20					

*The size specific U-Factor matrix is based on the Fixed, 4-Sided NFRC specimen size of 1200mm x 1500mm (47.25 in x 59 in). This represents 81.7% Vision Area / Total Area.



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

SHGC/VT CALCULATIONS (S70+ Fixed Window (25mm - Dual Glazed))							
Size Specific SHGC N	//atrix*		Size Specific VT N	latrix*			
Center-of-Glass SHGC	Overall SHGC		Center-of-Glass VT	Overall VT			
0.75	0.61		0.75	0.60			
0.70	0.57		0.70	0.56			
0.65	0.53		0.65	0.52			
0.60	0.49		0.60	0.48			
0.55	0.45		0.55	0.44			
0.50	0.41		0.50	0.40			
0.45	0.37		0.45	0.36			
0.40	0.33		0.40	0.32			
0.35	0.29		0.35	0.28			
0.30	0.25		0.30	0.24			
0.25	0.21		0.25	0.20			
0.20	0.17		0.20	0.16			
0.15	0.13		0.15	0.12			
0.10	0.09		0.10	0.08			
0.05	0.05		0.05	0.04			

*The size specific SHGC and VT matrices are based on the Fixed, 4-Sided NFRC specimen size of 1200mm x 1500mm (47.25 in x 59 in). This represents 81.7% Vision Area / Total Area.



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

ΤΟΤΑΙ	TOTAL PRODUCT CALCULATIONS (S70+ Fixed Window (25mm - Dual Glazed))								
		е					Tota	Product U-F	actor
Option Number	COG U-Factor	COG Temperatur	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	70.00% Vision Area	NFRC 100-2017	95.00% Vision Area
			Head	2.6937	0.5644	0.3544			
1	0.40	40 7°F	L. Jamb	2.6937	0.5426	0.4603	0 5 1 2 2	0 4057	0 4700
1	0.48	43.7 F	R. Jamb	2.6937	0.5426	0.4603	0.5132	0.4957	0.4788
			Sill	2.6937	0.5637	0.3544			
			Head	2.6937	0.5633	0.3443			
2	0.46	11 0°C	L. Jamb	2.6937	0.5415	0.4472		0 4906	0.4600
2	0.40	44.0 F	R. Jamb	2.6937	0.5415	0.4472	0.5005	0.4806	
			Sill	2.6937	0.5626	0.3444			
			Head	2.6937	0.5623	0.3343	0.4877	0.4655	
3	0 11	15 8°E	L. Jamb	2.6937	0.5404	0.4342			0.4413
5	0.44	45.01	R. Jamb	2.6937	0.5404	0.4342			
			Sill	2.6937	0.5616	0.3343			
			Head	2.6937	0.5612	0.3246	0.4751	0.4504	
1	0 12	16 8°E	L. Jamb	2.6937	0.5393	0.4215			0.4226
-	0.42	40.01	R. Jamb	2.6937	0.5393	0.4215			
			Sill	2.6937	0.5606	0.3246			
			Head	2.6937	0.5602	0.3146			
5	0 40	47 9°F	L. Jamb	2.6937	0.5383	0.4085	0 4624	0 4252	0 4040
5	0.40	ч <i>7</i> .5 г	R. Jamb	2.6937	0.5383	0.4085	0.4024	0.4355	0.4040
			Sill	2.6937	0.5595	0.3146			
			Head	2.6937	0.5593	0.3049			
6	0 38	48 9°F	L. Jamb	2.6937	0.5373	0.3959	0 4498	0 4203	0 3854
Ŭ	0.50	10.5 1	R. Jamb	2.6937	0.5373	0.3959	0.1150	0.1200	0.0001
			Sill	2.6937	0.5586	0.3050			
			Head	2.6937	0.5583	0.2952			
7	0.36	36 50 0°F	L. Jamb	2.6937	0.5362	0.3832	0.4371	0.4052	0.3670
,	0.00	50.0 .	R. Jamb	2.6937	0.5362	0.3832	011071	011002	0.0070
			Sill	2.6937	0.5576	0.2952			
			Head	2.6937	0.5577	0.2856			
8	0.34	51.0°F	L. Jamb	2.6937	0.5353	0.3705	0.4246	0.3901	0.3484
Ĭ		51.01	R. Jamb	2.6937	0.5353	0.3705	0.1210	0.0001	0.0101
1			Sill	2.6937	0.5567	0.2855			



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

ΤΟΤΑΙ	TOTAL PRODUCT CALCULATIONS (S70+ Fixed Window (25mm - Dual Glazed))								
		e					Tota	Product U-F	actor
Option Number	COG U-Factor	COG Temperatur	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	70.00% Vision Area	NFRC 100-2017	95.00% Vision Area
			Head	2.6937	0.5564	0.2758			
	0.22	F2 0°F	L. Jamb	2.6937	0.5343	0.3579	0 41 20	0 2751	0.2201
9	0.32	52.0 F	R. Jamb	2.6937	0.5343	0.3579	0.4120	0.3751	0.3301
			Sill	2.6937	0.5557	0.2758			
			Head	2.6937	0.5554	0.2662			
10	0.20	E2 1°E	L. Jamb	2.6937	0.5333	0.3455	0 2005	0.2600	0.3116
10	0.30	53.1 F	R. Jamb	2.6937	0.5333	0.3455	0.3995	0.3600	
			Sill	2.6937	0.5548	0.2663			
			Head	2.6937	0.5545	0.2567	0.3869	0 3449	
11	0.28	51 2°E	L. Jamb	2.6937	0.5324	0.3331			0 2933
1 11	0.20	J4.2 I	R. Jamb	2.6937	0.5324	0.3331		0.3449	0.2933
			Sill	2.6937	0.5539	0.2567			
			Head	2.6937	0.5536	0.2472	0.3744	0.3298	
12	0.26	55 2°F	L. Jamb	2.6937	0.5314	0.3206			0.2748
12	0.20	55.21	R. Jamb	2.6937	0.5314	0.3206			
			Sill	2.6937	0.5530	0.2472			
			Head	2.6937	0.5529	0.2380		0.2148	
13	0.24	56 3°F	L. Jamb	2.6937	0.5305	0.3083	0 3620		0 2566
	0.24	50.51	R. Jamb	2.6937	0.5305	0.3083	0.5020	0.5140	0.2300
			Sill	2.6937	0.5521	0.2377			
			Head	2.6937	0.5519	0.2282			
14	0.22	57 3°F	L. Jamb	2.6937	0.5296	0.2959	0 3495	0 2997	0 2385
	0.22	57.51	R. Jamb	2.6937	0.5296	0.2959	0.5455	0.2337	0.2303
			Sill	2.6937	0.5513	0.2282			
			Head	2.6937	0.5511	0.2188			
15	0.20	58 4°F	L. Jamb	2.6937	0.5288	0.2837	0 3371	0 2846	0 2203
	0.20	50.71	R. Jamb	2.6937	0.5288	0.2837	0.0071	0.2040	0.2200
			Sill	2.6937	0.5504	0.2188			
			Head	2.6937	0.5338	0.2030			
16	0.18	59.5°F	L. Jamb	2.6937	0.5112	0.2629	0.3170	0.2648	0.2011
		55.51	R. Jamb	2.6937	0.5112	0.2629	0.0170	0.2010	0.2011
			Sill	2.6937	0.5329	0.2029			



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 6

SIMULATION RESULTS

TOTAL PRODUCT CALCULATIONS (S70+ Fixed Window (25mm - Dual Glazed))										
		е					Total Product U-Factor			
Option Number	COG U-Factor	COG Temperatur	Cross Section	Frame Height	Frame U-Factor	Edge U-Factor	70.00% Vision Area	NFRC 100-2017	95.00% Vision Area	
			Head	2.6937	0.5329	0.1934				
17	0 16	60 6°F	L. Jamb	2.6937	0.5102	0.2504	0.3045	0.2495	0.1827	
<u> </u>	0.10	00.01	R. Jamb	2.6937	0.5102	0.2504				
			Sill	2.6937	0.5320	0.1933				
			Head	2.6937	0.5322	0.1831	0.2918	0.2342	0.1646	
18	0 14	61 6°F	L. Jamb	2.6937	0.5095	0.2370				
10	0.14	01.01	R. Jamb	2.6937	0.5095	0.2370				
			Sill	2.6937	0.5314	0.1830				
			Head	2.6937	0.5312	0.1737				
19	0 1 2	62 7°F	L. Jamb	2.6937	0.5085	0.2247	0 2793	0 2190	0 1464	
	0.12	02.7 1	R. Jamb	2.6937	0.5085	0.2247	0.2755	0.2150	0.1404	
			Sill	2.6937	0.5304	0.1735				
			Head	2.6937	0.5303	0.1641				
20	0 10	63 9°F	L. Jamb	2.6937	0.5075	0.2123	0 2660	0 2020	0 1281	
20	0.10	55.51	R. Jamb	2.6937	0.5075	0.2123	0.2005	0.2030	0.1201	
			Sill	2.6937	0.5295	0.1640				



TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 7

DRAWINGS / BILL OF MATERIALS

The drawings which follow have been reviewed by Intertek B&C and are representative of the simulation result(s) reported herein. Any deviations are documented herein or on the drawings.



ntertek Total Quality. Assured.	Report #: Date: Verified by	L0395-116-4 05/27/2020 Allion M.Fon	15) [
IMPOR THE DE PROPER BE REPI INDIREC THE WC	SIGN AND DETAILS SIGN AND DETAILS TTY OF GUTMANN I RODUCED OR OTH TLY AND MUST BE IRK OF THIS COM	OF THIS DRAWING ARE THE MIDDLE EAST LLC AND MUST ERWISE DISPOSED OF DIRECT USED ONLY IN CONNECTION VANY.	NOT "LY OR WITH					
NOTE								
Design p that sha feasibilit mepiper explore the desi permitte use of th of Sale a apply.	proposals as draw II be checked by the CUTMANN's we ce. All copyright, lated to the conce reserved. Reprod gn to third parties d with prior writter e design proposa und Delivery as we	ngs e.g. are not binding sugg re user as to correctness and winership exploitation and of winership exploitation and of uctions, distributions and/or completely or partially-shall consent. In other respects, fi our applicable General Cons II as our Technical Conditions	pestions, her bassing only be or the ditions a shall					
REMA	RKS							
1. Dimens fixing av calculat 2. Section	Dimensioning of the profiles, substructure, welding seams, fixing accessories and fixing to the building have to be calculated in accordance with the final structural calculations 2.							
silicone the edg supplie 3. Building	sealant. In respe e joint, the applic r must be observe	its are according to architect	ility with					
and are 4.	subject to his ap	proval.						
GUTMA OBSER 5. ALL DIN	INN FABRICATION VED. MENSIONS ARE II	N GUIDELINES MUST BE						
IMPOF	TANT							
All Cor Pre-Fill Adhes	mbinations of Gi ler should be ag ive and Sealant	ass, Silicone Adhesive an reed with the Glass, Suppliers. (Warranty)	d					
00 REV	10.03.2020 DATE	PROPOSED CONCEPT DWG DESCRIPTION						
CO	NSTRUCTION I	SSUE						
CLIEN	л: 							
MAIN	CONSULTANT:							
CONT	RACTOR:							
DESK	GNER:							
PROJ	ECT:		٦					
PROJ	ECT DESCRIPTIO	DN:						
GL		tmann System Lebanon S.A.L BOX 11-388, 5h Fu, Le Bureau Bid te Gemayel SI, National Museum Are +961 1425 280 +961 1425 281 w.gutmann.ae # SHAPED BY GUTMANN*	a, Beirut					
	S7 25mm G	0+ Fixed lass Thickness						
DRAV	VING TITLE: Elevation, H	lorizontal & Vertical Sections						
DATE	10.03.20 ECT NO.	20 DWG. No.	REV.					
PLOT PLOT FOLIC	SCALE AS SHO SCALE SSIZE A3 (N BY \$1	CD-105	0					
CHEC	KED BY DESIGN	DEPARTMENT						
THS PA	DRAWING IS A PROPE RT or whole should others whatsoeve	rty of Gutmann Middle East FZCC Be Reproduced, copied or Given R Without Their Prior Consent	NO TO					



	otoct		Report	#:	L0395-116	-45
т	otal Quality. Assured.	57	Date:	- hv	05/27/202 Mixan M A	20 nd
			vennee	1 by.	ounder in de	
		IMPOF	RTANT			
	7	THE DE PROPER	SIGN AND DI	ETAILS OF MANN MIDE	THIS DRAWING ARE TH	E ST NOT
	(BE REPI INDIREC	RODUCED O TLY AND MU RK OF THIS	R OTHERW JST BE USE COMPANY	ISE DISPOSED OF DIRE ED ONLY IN CONNECTIO Y.	CTLY OR
		NOTE				
A 4		Design (proposals as	drawings	e.g. are not binding su	ıggestions,
44.		feasibilit negliger	I De checke y. GUTMAN ice. All copy lated to the	d by the u N's warran right, own	ser as to correctness a ity is limited to intend a ership exploitation and lesion and realization a	na nd rough other
· · · ·		explicitly the desi permitte	reserved. F gn to third p d with prior	arties com written cor	ons, distributions and/o pletely or partially- sha sent. In other respects	I only be for the
4 4		use of the of Sale a apply.	e design pr Ind Delivery	oposal our as well as	r applicable General Co our Technical Condition	onditions ons shall
		REMA	RKS			
····· 41		1. Dimens	ioning of th	e profiles.	substructure, welding	seams.
.ª		fixing a calcula	ccessories a ted in accor	and fixing t dance with	to the building have to h the final structural ca	be Iculations.
4		2. Sealing silicone	of the glass sealant. In	s joint mus respect of	at be effected with UV- adhesion and comba	resistant tibility with
· · ·	(the edg supplie	e joint, the r must be o	applicatior bserved.	n guidelines of the sea	lant
		3. Building and are	attachmer subject to	it details a his approv	re according to archite ral.	icts design
		4. GUTM				
		OBSER	VED.	ATION G	DIDELINES MUST BE	
		ALL DI	IENSIONS	ARE IN MI	М.	
m Eneme Drefile 07040	N 0	IMPOF	TANT			
III. Flame Prome 27310	12	All Co	mbinations	of Glass	, Silicone Adhesive	and
		Pre-Fil Adhes	ler should ive and Se	be agree alant Sup	d with the Glass, opliers. (Warranty)	
er Glazing Gasket 7000	004	\square				
		H				
		00 BEV	10.03.2020 DATE	PR	OPOSED CONCEPT DV	VG
	ĺ	CO	NSTRUCT	ION ISSU	JE	
		CLIEN	IT:			Ĩ
	J					
		MAIN	CONSULT	ANT:		
	7	CONT	RACTOR:			ī
		DESI	GNER:			
ter Glazing Gasket 7000)04					
		PROJ	ECT:			Ħ
		PROJ	ECT DESCI	RIPTION:		
m. Frame Profile 27310)2	ALUN	INUM SYST	FEM: Gutmar	nn Svstem Lebanon S.A	
				PO BOX Pierre Ge	11-4368, 5th FL., Le Bureau E emayel St., National Museum /	Sidg., Area, Beirut
				Tel: +96 Fax: +96	1 1 425 280 i1 1 425 281	
		GL	ITMANN	<u>www.qu</u> JMINIUM SH	utmann.ae IAPED BY GUTMANN*	
			-			_
	and			S70 ·	Fixed	
4			25m	im Glas	ss Thickness	
		DRAV	ING TITLE	-		
· · · · · · · · · · · · · · · · · · ·			Ho	orizonta	al & Vertical	
				De	etails	
∆ <i>⊲</i>		DATE		0.03.2020	DWG. No.	REV.
		PROJ	ECT NO.	S SHOWN	CD-205	
4		PLOT	SCALE	A3	CD-200	
	لــــــ	DRAV	/N BY	5.L		
		CHEC	KED BY	JESIGN DEF	PARTMENT	
		PA	T OR WHOLE	SHOULD BE F	REPRODUCED, COPIED OR GN HOUT THEIR PRIOR CONSENT	EN TO





TEST REPORT FOR GUTMANN NORTH AMERICA

Report No.: L0395.01-116-45 R0 Date: 05/27/20

SECTION 8

REVISION LOG

REVISION #	DATE	PAGES	REVISION
.01R0	05/27/20	N/A	Original Report Issued to Gutmann North
			America.