



**NFRC U-FACTOR, SHGC, VT, &  
CONDENSATION RESISTANCE  
COMPUTER SIMULATION REPORT**

**Rendered to:  
US ALUMINUM INC., DIVISION OF CR LAURENCE CO., INC.**

**SERIES/MODEL:  
S80 Bi-Fold Door**

**Report Number: C4853.04-116-45  
Report Date: 08/20/13**

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COMPUTER SIMULATION REPORT**

Rendered to:  
US ALUMINUM INC., DIVISION OF CR LAURENCE CO., INC.  
200 Singleton Drive  
Waxahachie, Texas 75165

Report Number: C4853.04-116-45  
Simulation Date: 02/18/13  
Report Date: 08/20/13

**Project Summary:**

Architectural Testing, Inc. was contracted to perform U-Factor, Solar Heat Gain Coefficient, Visible Transmittance, and Condensation Resistance\* computer simulations in accordance with the National Fenestration Rating Council (NFRC). The products were evaluated in full compliance with NFRC requirements to the standards listed below.

*\*NFRC's Condensation Resistance rating is NOT equivalent to a Condensation Resistance Factor (CRF) determined in accordance with AAMA 1503.*

**Standards:**

*NFRC 100-2010: Procedure for Determining Fenestration Product U-Factors*

*NFRC 200-2010: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*

*NFRC 500-2010: Procedure for Determining Fenestration Product Condensation Resistance Values*

**Software:**

**Frame and Edge Modeling:** THERM 6.3.45  
**Center-of-Glass Modeling:** WINDOW 6.3.62  
**Total Product Calculations:** WINDOW 6.3.62  
**Spectral Data Library:** IGDB 27.0

**Simulations Specimen Description:**

**Series/Model:** S80 Bi-Fold Door  
**Type:** Double Door, French-style Door (XX or OX)  
**Frame Material:** AT Aluminum w/ Thermal Breaks - All Members  
**Sash Material:** AT Aluminum w/ Thermal Breaks - All Members  
**Standard Size:** 1920mm x 2090mm

**Modeling Assumptions/Technical Interpretations:**

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.

**Specialty Products Table:**

The specialty products method allow the manufacturer to determine the overall product SHGC and VT for any glazing option. The center of glass SHGC and/or VT must be determined using WINDOW 6.3.62. The method gives overall product SHGC and VT indexed on center of glass properties. All values used in the calculations are truncated to six decimal place precision.

	No Dividers	Dividers < 1	Dividers > 1
SHGC0	0.027815	0.030745	0.033464
SHGC1	0.693372	0.606108	0.525143
VT0	0.000000	0.000000	0.000000
VT1	0.665557	0.575362	0.491679

$$SHGC = SHGC0 + SHGCc (SHGC1 - SHGC0)$$

$$VT = VT0 + VTc (VT1 - VT0)$$

**Validation Matrix:**

The following products are part of a validation matrix. Only one is required for validation testing.

<i>Product Line</i>	<i>Report Number</i>
None	-

### Spacer Option Description

<i>Spacer Type</i>	<i>Sealant</i>		<i>Code</i>
	<i>Primary</i>	<i>Secondary</i>	
Aluminum Spacer	Butyl Rubber	Butyl Rubber	A1-D
GED Intercept Spacer	Butyl Rubber	Butyl Rubber	CU-D
Stainless Steel	PIB	Silicone	SS-D
Super Spacer Premium Plus	None	Butyl Rubber	ZF-S
Cardinal XL Edge Spacer	ADCO PIB	Silicone	SS-D

### Grid Option Description

<i>Grid Size</i>	<i>Grid Type</i>	<i>Grid Pattern</i>
None		

### Reinforcement Option Description

<i>Location</i>	<i>Material</i>
None	

### Gas Filling Technique Description

<i>Fill Type</i>	<i>Method</i>
90% Argon	Single-Probe Timed Filling

### Edge-of-Glass Construction

<i>Interior Condition</i>	EPDM Glazing Spline
<i>Exterior Condition</i>	EPDM Glazing Spline

### Weatherstripping

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
EPDM Bulb Seal	2 Rows	Frame Perimeter
EPDM Bulb Seal	6 Rows	Meeting Rail, Right Jamb
EPDM Bulb Seal	5 Rows	Left Jamb
EPDM Flap Gasket	4 Rows	Sill
EPDM Flap Gasket	3 Rows	Head
EPDM Flap Gasket	1 Row	Frame Perimeter, Left Jamb

### Frame/Sash Materials Finish

<i>Interior</i>	Painted Aluminum
<i>Exterior</i>	Painted Aluminum

**NFRC 100/200/500 Summary Sheet  
S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
1	Clear / Air / Clear (4m)											
	0.154	0.688	0.154					AIR		CL	A1-D	N
	U-Factor 0.55			SHGC (N) 0.52				VT (N) 0.54			CR 42	
2	SB60 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.035(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.48			CR 42	
3	SB60 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.28				VT (N) 0.48			CR 43	
4	SB60 Atlantica / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	A1-D	N
	U-Factor 0.43			SHGC (N) 0.21				VT (N) 0.36			CR 43	
5	SB60 Atlantica / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	A1-D	N
	U-Factor 0.40			SHGC (N) 0.20				VT (N) 0.36			CR 43	
6	SB70 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.018(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.21				VT (N) 0.42			CR 42	
7	SB70 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.018(#2)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.21				VT (N) 0.42			CR 43	
8	VE185 / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.088(#2)	CL	A1-D	N
	U-Factor 0.44			SHGC (N) 0.39				VT (N) 0.51			CR 43	
9	VE185 / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.088(#2)	CL	A1-D	N
	U-Factor 0.41			SHGC (N) 0.39				VT (N) 0.51			CR 43	
10	VE12M / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.040(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.47			CR 43	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
11	VE12M / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.040(#2)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.28				VT (N) 0.47			CR 43	
12	TiAC36 / Air / Clear (4m)											
	0.157	0.688	0.156					AIR	0.034(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.27				VT (N) 0.44			CR 42	
13	TiAC36 / Arg90 / Clear (4m)											
	0.157	0.688	0.156					ARG90	0.034(#2)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.27				VT (N) 0.44			CR 43	
14	TiAC23 / Air / Clear (4m)											
	0.150	0.688	0.156					AIR	0.038(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.18				VT (N) 0.26			CR 42	
15	TiAC23 / Arg90 / Clear (4m)											
	0.150	0.688	0.156					ARG90	0.038(#2)	CL	A1-D	N
	U-Factor 0.41			SHGC (N) 0.18				VT (N) 0.26			CR 43	
16	Bronze / Air / SB60 (4m)											
	0.154	0.688	0.154					AIR	0.035(#3)	BZ	A1-D	N
	U-Factor 0.43			SHGC (N) 0.26				VT (N) 0.33			CR 42	
17	Bronze / Arg90 / SB60 (4m)											
	0.154	0.688	0.154					ARG90	0.035(#3)	BZ	A1-D	N
	U-Factor 0.40			SHGC (N) 0.26				VT (N) 0.33			CR 42	
18	SB R100 / Air / Clear (5m)											
	0.184	0.625	0.184					AIR	0.036(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.18				VT (N) 0.28			CR 42	
19	SB R100 / Arg90 / Clear (5m)											
	0.184	0.625	0.184					ARG90	0.036(#2)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.18				VT (N) 0.28			CR 43	
20	Bronze / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	BZ	A1-D	N
	U-Factor 0.43			SHGC (N) 0.23				VT (N) 0.18			CR 42	

**NFRC 100/200/500 Summary Sheet  
S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
21	Bronze / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	BZ	A1-D	N
	U-Factor 0.40			SHGC (N) 0.22				VT (N) 0.18			CR 42	
22	Gray / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	GY	A1-D	N
	U-Factor 0.43			SHGC (N) 0.21				VT (N) 0.16			CR 42	
23	Gray / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	GY	A1-D	N
	U-Factor 0.40			SHGC (N) 0.21				VT (N) 0.16			CR 42	
24	Clear / Air / SB65 (4m)											
	0.154	0.688	0.154					AIR	0.031(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.33				VT (N) 0.47			CR 42	
25	Clear / Arg90 / SB65 (4m)											
	0.154	0.688	0.154					ARG90	0.031(#3)	CL	A1-D	N
	U-Factor 0.40			SHGC (N) 0.34				VT (N) 0.47			CR 42	
26	SB70 / Air / SB70 / Air / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			AIR	0.018(#2) / 0.018(#4)	CL	A1-D	N
	U-Factor 0.33			SHGC (N) 0.17				VT (N) 0.31			CR 43	
27	SB70 / Arg90 / SB70 / Arg90 / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			ARG90	0.018(#2) / 0.018(#4)	CL	A1-D	N
	U-Factor 0.31			SHGC (N) 0.17				VT (N) 0.31			CR 44	
28	SB60 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.035(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.48			CR 43	
29	SB60 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.035(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.28				VT (N) 0.48			CR 44	
30	SB60 Atlantica / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	CU-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.36			CR 43	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
31	SB60 Atlantica / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	CU-D	N
	U-Factor 0.39			SHGC (N) 0.20				VT (N) 0.36			CR 44	
32	SB70 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.018(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.42			CR 43	
33	SB70 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.018(#2)	CL	CU-D	N
	U-Factor 0.39			SHGC (N) 0.21				VT (N) 0.42			CR 44	
34	VE185 / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.088(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.39				VT (N) 0.51			CR 43	
35	VE185 / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.088(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.39				VT (N) 0.51			CR 44	
36	VE12M / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.040(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.47			CR 43	
37	VE12M / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.040(#2)	CL	CU-D	N
	U-Factor 0.39			SHGC (N) 0.28				VT (N) 0.47			CR 44	
38	TiAC36 / Air / Clear (4m)											
	0.157	0.688	0.156					AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.27				VT (N) 0.44			CR 43	
39	TiAC36 / Arg90 / Clear (4m)											
	0.157	0.688	0.156					ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.27				VT (N) 0.44			CR 44	
40	TiAC23 / Air / Clear (4m)											
	0.150	0.688	0.156					AIR	0.038(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.18				VT (N) 0.26			CR 43	



**NFRC 100/200/500 Summary Sheet  
S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
41	TiAC23 / Arg90 / Clear (4m)											
	0.150	0.688	0.156					ARG90	0.038(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.18				VT (N) 0.26			CR 44	
42	SB R100 / Air / Clear (5m)											
	0.184	0.625	0.184					AIR	0.036(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.18				VT (N) 0.28			CR 43	
43	SB R100 / Arg90 / Clear (5m)											
	0.184	0.625	0.184					ARG90	0.036(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.18				VT (N) 0.28			CR 44	
44	Bronze / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	BZ	CU-D	N
	U-Factor 0.43			SHGC (N) 0.23				VT (N) 0.18			CR 43	
45	Bronze / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	BZ	CU-D	N
	U-Factor 0.40			SHGC (N) 0.22				VT (N) 0.18			CR 43	
46	Gray / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	GY	CU-D	N
	U-Factor 0.43			SHGC (N) 0.21				VT (N) 0.16			CR 43	
47	Gray / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	GY	CU-D	N
	U-Factor 0.40			SHGC (N) 0.21				VT (N) 0.16			CR 43	
48	Clear / Air / SB65 (4m)											
	0.154	0.688	0.154					AIR	0.031(#3)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.33				VT (N) 0.47			CR 43	
49	Clear / Arg90 / SB65 (4m)											
	0.154	0.688	0.154					ARG90	0.031(#3)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.34				VT (N) 0.47			CR 43	
50	SB70 / Air / SB70 / Air / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			AIR	0.018(#2) / 0.018(#4)	CL	CU-D	N
	U-Factor 0.32			SHGC (N) 0.17				VT (N) 0.31			CR 44	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
51	SB70 / Arg90 / SB70 / Arg90 / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			ARG90	0.018(#2) / 0.018(#4)	CL	CU-D	N
	U-Factor 0.30			SHGC (N) 0.17				VT (N) 0.31			CR 45	
52	Stainless Steel Box Spacer: SB60 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.035(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.48			CR 44	
53	Stainless Steel Box Spacer: SB60 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.035(#2)	CL	SS-D	N
	U-Factor 0.40			SHGC (N) 0.28				VT (N) 0.48			CR 44	
54	Stainless Steel Box Spacer: SB60 Atlantica / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.36			CR 44	
55	Stainless Steel Box Spacer: SB60 Atlantica / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	SS-D	N
	U-Factor 0.39			SHGC (N) 0.20				VT (N) 0.36			CR 44	
56	Stainless Steel Box Spacer: SB70 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.018(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.42			CR 44	
57	Stainless Steel Box Spacer: SB70 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.018(#2)	CL	SS-D	N
	U-Factor 0.39			SHGC (N) 0.21				VT (N) 0.42			CR 44	
58	Stainless Steel Box Spacer: VE185 / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.088(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.39				VT (N) 0.51			CR 43	
59	Stainless Steel Box Spacer: VE185 / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.088(#2)	CL	SS-D	N
	U-Factor 0.40			SHGC (N) 0.39				VT (N) 0.51			CR 44	
60	Stainless Steel Box Spacer: VE12M / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.040(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.47			CR 44	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
61	Stainless Steel Box Spacer: VE12M / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.040(#2)	CL	SS-D	N
	U-Factor 0.39			SHGC (N) 0.28				VT (N) 0.47			CR 44	
62	Stainless Steel Box Spacer: TiAC36 / Air / Clear (4m)											
	0.157	0.688	0.156					AIR	0.034(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.27				VT (N) 0.44			CR 44	
63	Stainless Steel Box Spacer: TiAC36 / Arg90 / Clear (4m)											
	0.157	0.688	0.156					ARG90	0.034(#2)	CL	SS-D	N
	U-Factor 0.40			SHGC (N) 0.27				VT (N) 0.44			CR 44	
64	Stainless Steel Box Spacer: TiAC23 / Air / Clear (4m)											
	0.150	0.688	0.156					AIR	0.038(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.18				VT (N) 0.26			CR 44	
65	Stainless Steel Box Spacer: TiAC23 / Arg90 / Clear (4m)											
	0.150	0.688	0.156					ARG90	0.038(#2)	CL	SS-D	N
	U-Factor 0.40			SHGC (N) 0.18				VT (N) 0.26			CR 44	
66	Stainless Steel Box Spacer: Bronze / Air / SB60 (4m)											
	0.154	0.688	0.154					AIR	0.035(#3)	BZ	SS-D	N
	U-Factor 0.43			SHGC (N) 0.26				VT (N) 0.33			CR 44	
67	Stainless Steel Box Spacer: Bronze / Arg90 / SB60 (4m)											
	0.154	0.688	0.154					ARG90	0.035(#3)	BZ	SS-D	N
	U-Factor 0.40			SHGC (N) 0.26				VT (N) 0.33			CR 44	
68	Stainless Steel Box Spacer: SB R100 / Air / Clear (5m)											
	0.184	0.625	0.184					AIR	0.036(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.18				VT (N) 0.28			CR 43	
69	Stainless Steel Box Spacer: SB R100 / Arg90 / Clear (5m)											
	0.184	0.625	0.184					ARG90	0.036(#2)	CL	SS-D	N
	U-Factor 0.39			SHGC (N) 0.18				VT (N) 0.28			CR 44	
70	Stainless Steel Box Spacer: Bronze / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	BZ	SS-D	N
	U-Factor 0.42			SHGC (N) 0.23				VT (N) 0.18			CR 43	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
71	Stainless Steel Box Spacer: Bronze / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	BZ	SS-D	N
	U-Factor 0.39			SHGC (N) 0.22				VT (N) 0.18			CR 44	
72	Stainless Steel Box Spacer: Gray / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	GY	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.16			CR 43	
73	Stainless Steel Box Spacer: Gray / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	GY	SS-D	N
	U-Factor 0.39			SHGC (N) 0.21				VT (N) 0.16			CR 44	
74	Stainless Steel Box Spacer: Clear / Air / SB65 (4m)											
	0.154	0.688	0.154					AIR	0.031(#3)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.33				VT (N) 0.47			CR 44	
75	Stainless Steel Box Spacer: Clear / Arg90 / SB65 (4m)											
	0.154	0.688	0.154					ARG90	0.031(#3)	CL	SS-D	N
	U-Factor 0.39			SHGC (N) 0.34				VT (N) 0.47			CR 44	
76	Stainless Steel Box Spacer: SB70 / Air / SB70 / Air / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			AIR	0.018(#2) / 0.018(#4)	CL	SS-D	N
	U-Factor 0.32			SHGC (N) 0.17				VT (N) 0.31			CR 45	
77	Stainless Steel Box Spacer: SB70 / Arg90 / SB70 / Arg90 / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			ARG90	0.018(#2) / 0.018(#4)	CL	SS-D	N
	U-Factor 0.30			SHGC (N) 0.17				VT (N) 0.31			CR 45	
78	Stainless Steel Box Spacer: E366 / Air / Clear (4m)											
	0.153	0.688	0.156					AIR	0.022(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.43			CR 44	
79	Cardinal XL-Edge Spacer: E366 / Arg90 / Clear (4m)											
	0.153	0.688	0.156					ARG90	0.022(#2)	CL	SS-D	N
	U-Factor 0.39			SHGC (N) 0.21				VT (N) 0.43			CR 45	
80	Cardinal XL-Edge Spacer: E366 / Air / E366 / Air / Clear (DS)											
	0.117	0.531	0.117	0.531	0.117			AIR	0.022(#2) / 0.022(#4)	CL	SS-D	N
	U-Factor 0.32			SHGC (N) 0.17				VT (N) 0.31			CR 46	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
81	Cardinal XL-Edge Spacer: E366 / Arg90 / E366 / Arg90 / Clear (DS)											
	0.117	0.531	0.117	0.531	0.117			ARG90	0.022(#2) / 0.022(#4)	CL	SS-D	N
	U-Factor 0.30			SHGC (N) 0.17				VT (N) 0.31			CR 46	
82	SB60 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.035(#2)	CL	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.48			CR 45	
83	SB60 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.035(#2)	CL	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.28				VT (N) 0.48			CR 45	
84	SB70 / Air / Clear (4m)											
	0.154	0.688	0.154					AIR	0.018(#2)	CL	ZF-S	N
	U-Factor 0.41			SHGC (N) 0.21				VT (N) 0.42			CR 45	
85	SB70 / Arg90 / Clear (4m)											
	0.154	0.688	0.154					ARG90	0.018(#2)	CL	ZF-S	N
	U-Factor 0.38			SHGC (N) 0.21				VT (N) 0.42			CR 45	
86	VE12M / Air / Clear (6m)											
	0.223	0.500	0.223					AIR	0.040(#2)	CL	ZF-S	N
	U-Factor 0.41			SHGC (N) 0.28				VT (N) 0.47			CR 45	
87	VE12M / Arg90 / Clear (6m)											
	0.223	0.500	0.223					ARG90	0.040(#2)	CL	ZF-S	N
	U-Factor 0.38			SHGC (N) 0.28				VT (N) 0.47			CR 45	
88	TiAC36 / Air / Clear (4m)											
	0.157	0.688	0.156					AIR	0.034(#2)	CL	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.27				VT (N) 0.44			CR 45	
89	TiAC36 / Arg90 / Clear (4m)											
	0.157	0.688	0.156					ARG90	0.034(#2)	CL	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.27				VT (N) 0.44			CR 45	
90	TiAC23 / Air / Clear (4m)											
	0.150	0.688	0.156					AIR	0.038(#2)	CL	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.18				VT (N) 0.26			CR 45	

**NFRC 100/200/500 Summary Sheet  
S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type
	U-Factor			Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)				Visible Transmittance (VT) Grids (None / <1 / >=1)			Condensation Resistance	
91	TiAC23 / Arg90 / Clear (4m)											
	0.150	0.688	0.156					ARG90	0.038(#2)	CL	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.18				VT (N) 0.26			CR 45	
92	SB R100 / Air / Clear (5m)											
	0.184	0.625	0.184					AIR	0.036(#2)	CL	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.18				VT (N) 0.28			CR 45	
93	SB R100 / Arg90 / Clear (5m)											
	0.184	0.625	0.184					ARG90	0.036(#2)	CL	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.18				VT (N) 0.28			CR 45	
94	Bronze / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	BZ	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.23				VT (N) 0.18			CR 44	
95	Bronze / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	BZ	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.22				VT (N) 0.18			CR 45	
96	Gray / Air / SB R100 (5m)											
	0.184	0.625	0.184					AIR	0.036(#3)	GY	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.16			CR 44	
97	Gray / Arg90 / SB R100 (5m)											
	0.184	0.625	0.184					ARG90	0.036(#3)	GY	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.21				VT (N) 0.16			CR 45	
98	Clear / Air / SB65 (4m)											
	0.154	0.688	0.154					AIR	0.031(#3)	CL	ZF-S	N
	U-Factor 0.42			SHGC (N) 0.33				VT (N) 0.47			CR 45	
99	Clear / Arg90 / SB65 (4m)											
	0.154	0.688	0.154					ARG90	0.031(#3)	CL	ZF-S	N
	U-Factor 0.39			SHGC (N) 0.34				VT (N) 0.47			CR 45	
100	SB70 / Air / SB70 / Air / Clear (DS)											
	0.129	0.531	0.129	0.531	0.129			AIR	0.018(#2) / 0.018(#4)	CL	ZF-S	N
	U-Factor 0.31			SHGC (N) 0.17				VT (N) 0.31			CR 46	

**NFRC 100/200/500 Summary Sheet**  
**S80 Bi-Fold Door**

ID	Pane Thickness 1	Gap Width 1	Pane Thickness 2	Gap Width 2	Pane Thickness 3	Gap Width 3	Pane Thickness 4	Gap Fill	Low-e (Surface#)	Tint	Spacer	Grid Type		
	U-Factor		Solar Heat Gain Coefficient (SHGC) Grids (None / <1 / >=1)					Visible Transmittance (VT) Grids (None / <1 / >=1)		Condensation Resistance				
101	SB70 / Arg90 / SB70 / Arg90 / Clear (DS)													
	0.129	0.531	0.129	0.531	0.129			ARG90	0.018(#2) / 0.018(#4)	CL	ZF-S	N		
	U-Factor		0.29		SHGC (N)			0.17		VT (N)		0.31		CR

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.

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. The ratings values were rounded in accordance to NFRC 601, NFRC Unit and Measurement Policy.

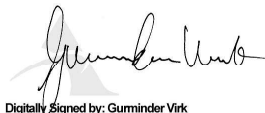
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Gurminder Virk  
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REVIEWED BY:



Digitally Signed by: Michael Cooper

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Michael Cooper  
Senior Simulation Technician  
Simulator-In-Responsible-Charge

GV:gv

C4853.04-116-45

Attachments (pages):

Appendix A: Drawings and Bills of Material (10)

This report is complete only when all attachments listed are included.