

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

(Revised)

**Rendered to:
UNITED STATES ALUMINUM**

**SERIES/MODEL:
Series 8000 Single Hung**

<i>Baseline Product for Validation Testing</i>	
Simulated Thermal Transmittance (U-Factor)	
	0.454
Unit Size:	47.25 inches wide by 59.00 inches high
Glazing Layer 1:	DS PPG Solarban 70 (e=0.018,#2)
Gap 1:	0.500 inch Tin-Plate Intercept Spacer (CU-D) - 90% Argon Fill
Glazing Layer 2:	DS Clear
Gap 2:	0.500 inch Tin-Plate Intercept Spacer (CU-D) - 90% Argon Fill
Glazing Layer 3:	DS Clear
Notes:	Test Option was Skip & Debridged

Report Number: 99402.02-116-45
Original Report Date: 05/13/10
Expiration Date: 05/13/14
Revised Report Date: 07/22/10

NFRC U-FACTOR, SHGC, VT, & CONDENSATION RESISTANCE
COMPUTER SIMULATION REPORT
(Revised)

Rendered to:
UNITED STATES ALUMINUM
200 Singleton Drive
Waxahachie, Texas 75165

Report Number: 99402.02-116-45
Simulation Date: 05/13/10
Original Report Date: 05/13/10
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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 100-2004: Procedure for Determining Fenestration Product U-Factors
NFRC 200-2004: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence
NFRC 500-2004: Procedure for Determining Fenestration Product Condensation Resistance Values

Software:

Frame and Edge Modeling: THERM 5.2.14
Center-of-Glass Modeling: WINDOW 5.2.17
Total Product Calculations: WINDOW 5.2.17
Spectral Data Library: 17.3

Simulations Specimen Description:

Series/Model: Series 8000 Single Hung
Type: Vertical Slider , Single Hung
Frame Material: AT Aluminum w/ Thermal Breaks - All Members
Sash Material: AT Aluminum w/ Thermal Breaks - All Members
Standard Size: 1200mm x 1500mm

Technical Interpretations:

None

Modeling Assumptions:

- 1) To prevent air infiltration, tape was applied to all interior sash crack locations.
- 2) Product was simulated as fully debridged per customer request. Drawings reflect test option skip and debridge measurement.

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 5.2. 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	0.011861	0.014515	0.017011
SHGC1	0.737893	0.659035	0.584859
VT0	0.000000	0.000000	0.000000
VT1	0.726032	0.644520	0.567847

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

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

Validation Matrix:

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

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

Spacer Option Description

<i>Spacer Type</i>	<i>Sealant</i>		
	<i>Primary</i>	<i>Secondary</i>	<i>Desiccant</i>
Standard Aluminum Spacer (A1-D)	Butyl Rubber	Butyl Rubber	Yes
Tin-Plate Intercept Spacer (CU-D)	Butyl Rubber	Butyl Rubber	Yes
Standard Stainless Steel Spacer (SS-D)	PIB	Silicone	Yes
Standard Steel Spacer (CS-D)	PIB	Silicone	Yes
Edgetech Standard Super Spacer	Butyl Rubber		No
Rectangular Aluminum Box Spacer (A1-D)	Butyl Rubber	Butyl Rubber	Yes

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
90% Krypton	Dual-probe with concentration sensor

Edge-of-Glass Construction

<i>Interior Condition</i>	<i>Exterior Condition</i>
EPDM gasket against glass	EPDM gasket between aluminum glazing bead and glass

Weatherstripping

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Finpile	2 rows	Sill
Finpile	1 row	Lock Rail, Keeper Rail, Jambs
Weatherstrip Slide	1 row	Exterior Jamb, Sill

Frame/Sash Materials Finish

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

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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											
	0.225	0.500	0.225					AIR		CL	A1-D	N
	U-Factor 0.59			SHGC (N) 0.52					VT (N) 0.57		CR 41	
2	Clear / arg / Clear											
	0.225	0.500	0.225					ARG90		CL	A1-D	N
	U-Factor 0.57			SHGC (N) 0.52					VT (N) 0.57		CR 43	
3	Solarban 60 / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 44	
	Clear / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.51		CR 44	
	Solarban 60 on Atlantica / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	A1-D	N
	U-Factor 0.46			SHGC (N) 0.21					VT (N) 0.39		CR 44	
	Atlantica / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	GR	A1-D	N
	U-Factor 0.46			SHGC (N) 0.23					VT (N) 0.39		CR 44	
	4	Solarban 60 / arg / Clear										
0.223		0.500	0.223					ARG90	0.035(#2)	CL	A1-D	N
U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51		CR 44		
Clear / arg / Solarban 60												
0.223		0.500	0.223					ARG90	0.035(#3)	CL	A1-D	N
U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.51		CR 44		
Solarban 60 on Atlantica / arg / Clear												
0.223		0.500	0.223					ARG90	0.035(#2)	GR	A1-D	N
U-Factor 0.43			SHGC (N) 0.20					VT (N) 0.39		CR 44		
Atlantica / arg / Solarban 60												
0.223	0.500	0.223					ARG90	0.035(#3)	GR	A1-D	N	
U-Factor 0.43			SHGC (N) 0.23					VT (N) 0.39		CR 44		

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
5	Solarban 70XL / air / Clear											
	0.223	0.500	0.223					AIR	0.018(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.21				VT (N) 0.47			CR 44	
	Clear / air / Solarban 70XL											
	0.223	0.500	0.223					AIR	0.018(#3)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.28				VT (N) 0.47			CR 44	
6	Solarban 70XL / arg / Clear											
	0.223	0.500	0.223					ARG90	0.018(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.21				VT (N) 0.47			CR 44	
	Clear / arg / Solarban 70XL											
	0.223	0.500	0.223					ARG90	0.018(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.47			CR 44	
7	VE185 / air / Clear											
	0.223	0.500	0.225					AIR	0.088(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.41				VT (N) 0.55			CR 44	
	Clear / air / VE185											
	0.225	0.500	0.223					AIR	0.088(#3)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.43				VT (N) 0.55			CR 44	
8	VE185 / arg / Clear											
	0.223	0.500	0.225					ARG90	0.088(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.41				VT (N) 0.55			CR 44	
	Clear / arg / VE185											
	0.225	0.500	0.223					ARG90	0.088(#3)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.43				VT (N) 0.55			CR 44	
9	VE12M / air / Clear											
	0.223	0.500	0.225					AIR	0.040(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.29				VT (N) 0.51			CR 44	
	Clear / air / VE12M											
	0.225	0.500	0.223					AIR	0.040(#3)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.34				VT (N) 0.51			CR 44	

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
10	VE12M / arg / Clear											
	0.223	0.500	0.225					ARG90	0.040(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51		CR 44	
	Clear / arg / VE12M											
	0.225	0.500	0.223					ARG90	0.040(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.51		CR 44	
11	Comfort TiAC36 / air / Clear											
	0.222	0.500	0.225					AIR	0.034(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.27					VT (N) 0.47		CR 44	
	Clear / air / Comfort TiAC36											
	0.225	0.500	0.222					AIR	0.034(#3)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.47		CR 44	
12	Comfort TiAC36 / arg / Clear											
	0.222	0.500	0.225					ARG90	0.034(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.27					VT (N) 0.47		CR 44	
	Clear / arg / Comfort TiAC36											
	0.225	0.500	0.222					ARG90	0.034(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.47		CR 44	
13	Comfort TiAC23 / air / Clear											
	0.228	0.500	0.225					AIR	0.041(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.28		CR 44	
	Clear / air / Comfort TiAC23											
	0.225	0.500	0.228					AIR	0.041(#3)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.28		CR 44	
14	Comfort TiAC23 / arg / Clear											
	0.228	0.500	0.225					ARG90	0.041(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.28		CR 44	
	Clear / arg / Comfort TiAC23											
	0.225	0.500	0.228					ARG90	0.041(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.35					VT (N) 0.28		CR 44	



NFRC 100/200/500 Summary Sheet

Series 8000 Single Hung

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	
15	Energy Advantage / air / Clear											
	0.222	0.500	0.223					AIR	0.157(#2)	CL	A1-D	N
	U-Factor		0.49	SHGC (N)				0.46	VT (N)		0.53	CR
	Clear / air / Energy Advantage											
	0.223	0.500	0.222					AIR	0.157(#3)	CL	A1-D	N
	U-Factor		0.49	SHGC (N)				0.50	VT (N)		0.53	CR
16	Energy Advantage / arg / Clear											
	0.222	0.500	0.223					ARG90	0.157(#2)	CL	A1-D	N
	U-Factor		0.46	SHGC (N)				0.46	VT (N)		0.53	CR
	Clear/ arg / Energy Advantage											
	0.223	0.500	0.222					ARG90	0.157(#3)	CL	A1-D	N
	U-Factor		0.46	SHGC (N)				0.50	VT (N)		0.53	CR
17	Sungate 100 / air / Clear											
	0.223	0.500	0.223					AIR	0.087(#2)	CL	A1-D	N
	U-Factor		0.47	SHGC (N)				0.41	VT (N)		0.55	CR
	Clear / air / Sungate 100											
	0.223	0.500	0.223					AIR	0.087(#3)	CL	A1-D	N
	U-Factor		0.47	SHGC (N)				0.44	VT (N)		0.55	CR
18	Sungate 100 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.087(#2)	CL	A1-D	N
	U-Factor		0.45	SHGC (N)				0.41	VT (N)		0.55	CR
	Clear / arg / Sungate 100											
	0.223	0.500	0.223					ARG90	0.087(#3)	CL	A1-D	N
	U-Factor		0.45	SHGC (N)				0.44	VT (N)		0.55	CR
19	Solarban 80 / air / Clear											
	0.223	0.500	0.223					AIR	0.024(#2)	CL	A1-D	N
	U-Factor		0.46	SHGC (N)				0.19	VT (N)		0.34	CR
	Clear / air / Solarban 80											
	0.223	0.500	0.223					AIR	0.024(#3)	CL	A1-D	N
	U-Factor		0.46	SHGC (N)				0.22	VT (N)		0.34	CR

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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
20	Solarban 80 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.024(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.34			CR 44
	Clear / arg / Solarban 80											
	0.223	0.500	0.223					ARG90	0.024(#3)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.22					VT (N) 0.34			CR 44
21	Clear / air / Clear Laminate (030pvb)											
	0.225	0.500	0.266					AIR		CL	A1-D	N
	U-Factor 0.58			SHGC (N) 0.51					VT (N) 0.57			CR 42
22	Clear / arg / Clear Laminate (030pvb)											
	0.225	0.500	0.266					ARG90		CL	A1-D	N
	U-Factor 0.56			SHGC (N) 0.51					VT (N) 0.57			CR 43
23	Solarban 60 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.035(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51			CR 44
24	Solarban 60 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51			CR 44
25	Solarban 70XL / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.018(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.46			CR 44
26	Solarban 70XL / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.018(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.21					VT (N) 0.46			CR 44
27	VE185 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.088(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.40					VT (N) 0.55			CR 44
28	VE185 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.088(#2)	CL	A1-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.55			CR 44

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
29	VE12M / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.040(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 44	
30	VE12M / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.040(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51		CR 44	
31	Comfort TiAC36 / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.034(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.27					VT (N) 0.47		CR 44	
32	Comfort TiAC36 / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.034(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.27					VT (N) 0.47		CR 44	
33	Comfort TiAC23 / air / Clear Laminate (030pvb)											
	0.228	0.500	0.266					AIR	0.041(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.28		CR 44	
34	Comfort TiAC23 / arg / Clear Laminate (030pvb)											
	0.228	0.500	0.266					ARG90	0.041(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.17					VT (N) 0.28		CR 44	
35	Energy Advantage / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.157(#2)	CL	A1-D	N
	U-Factor 0.49			SHGC (N) 0.46					VT (N) 0.53		CR 44	
36	Energy Advantage / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.157(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.46					VT (N) 0.53		CR 44	
37	Sungate 100 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.087(#2)	CL	A1-D	N
	U-Factor 0.47			SHGC (N) 0.40					VT (N) 0.55		CR 44	
38	Sungate 100 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.087(#2)	CL	A1-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.55		CR 44	

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
39	Solarban 80 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.024(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.34		CR 44	
40	Solarban 80 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.024(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.34		CR 44	
41	Clear / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR		CL	A1-D	N
	U-Factor 0.57			SHGC (N) 0.50					VT (N) 0.55		CR 42	
42	Clear / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90		CL	A1-D	N
	U-Factor 0.55			SHGC (N) 0.50					VT (N) 0.55		CR 44	
43	Solarban 60 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.035(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 45	
44	Solarban 60 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 46	
45	Solarban 70XL / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.018(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.44		CR 45	
46	Solarban 70XL / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.018(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.21					VT (N) 0.44		CR 46	
47	VE185 / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.088(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 45	
48	VE185 / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.088(#2)	CL	A1-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.53		CR 45	

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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	
49	VE12M / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.040(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 45	
50	VE12M / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.040(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 46	
51	Comfort TiAC36 / air / Clear Laminate (090sgp)											
	0.187	0.500	0.536					AIR	0.034(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.46		CR 45	
52	Comfort TiAC36 / arg / Clear Laminate (090sgp)											
	0.187	0.500	0.536					ARG90	0.034(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.46		CR 46	
53	Comfort TiAC23 / air / Clear Laminate (090sgp)											
	0.197	0.500	0.536					AIR	0.039(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.27		CR 45	
54	Comfort TiAC23 / arg / Clear Laminate (090sgp)											
	0.197	0.500	0.536					ARG90	0.039(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.17					VT (N) 0.27		CR 46	
55	Energy Advantage / air / Clear Laminate (090sgp)											
	0.186	0.500	0.536					AIR	0.158(#2)	CL	A1-D	N
	U-Factor 0.48			SHGC (N) 0.45					VT (N) 0.51		CR 45	
56	Energy Advantage / arg / Clear Laminate (090sgp)											
	0.186	0.500	0.536					ARG90	0.158(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.45					VT (N) 0.51		CR 45	
57	Sungate 100 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.087(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 45	
58	Sungate 100 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.087(#2)	CL	A1-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.53		CR 45	

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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	
59	Solarban 80 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.024(#2)	CL	A1-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.33		CR 45	
60	Solarban 80 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.024(#2)	CL	A1-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.33		CR 46	
61	Solarban 60 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.035(#2)	CL	A1-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 44	
62	Solarban 60 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.035(#2)	CL	A1-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51		CR 44	
63	Clear / air / Clear											
	0.225	0.500	0.225					AIR		CL	CU-D	N
	U-Factor 0.58			SHGC (N) 0.52					VT (N) 0.57		CR 44	
64	Clear / arg / Clear											
	0.225	0.500	0.225					ARG90		CL	CU-D	N
	U-Factor 0.56			SHGC (N) 0.52					VT (N) 0.57		CR 44	
65	Solarban 60 / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 46	
	Clear / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.51		CR 46	
	Solarban 60 on Atlantica / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	CU-D	N
	U-Factor 0.46			SHGC (N) 0.21					VT (N) 0.39		CR 46	
	Atlantica / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	GR	CU-D	N
	U-Factor 0.46			SHGC (N) 0.23					VT (N) 0.39		CR 46	

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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	
66	Solarban 60 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.035(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.51			CR 46	
	Clear / arg / Solarban 60											
	0.223	0.500	0.223					ARG90	0.035(#3)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.34				VT (N) 0.51			CR 46	
	Solarban 60 on Atlantica / arg / Clear											
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	CU-D	N
	U-Factor 0.43			SHGC (N) 0.20				VT (N) 0.39			CR 46	
	Atlantica / arg / Solarban 60											
	0.223	0.500	0.223					ARG90	0.035(#3)	GR	CU-D	N
	U-Factor 0.43			SHGC (N) 0.23				VT (N) 0.39			CR 46	
67	Solarban 70XL / air / Clear											
	0.223	0.500	0.223					AIR	0.018(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.21				VT (N) 0.47			CR 46	
	Clear / air / Solarban 70XL											
	0.223	0.500	0.223					AIR	0.018(#3)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.28				VT (N) 0.47			CR 46	
68	Solarban 70XL / arg / Clear											
	0.223	0.500	0.223					ARG90	0.018(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.47			CR 46	
	Clear / arg / Solarban 70XL											
	0.223	0.500	0.223					ARG90	0.018(#3)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.47			CR 46	
69	VE185 / air / Clear											
	0.223	0.500	0.225					AIR	0.088(#2)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.41				VT (N) 0.55			CR 46	
	Clear / air / VE185											
	0.225	0.500	0.223					AIR	0.088(#3)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.43				VT (N) 0.55			CR 46	

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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
70	VE185 / arg / Clear											
	0.223	0.500	0.225					ARG90	0.088(#2)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.41					VT (N) 0.55			CR 46
	Clear / arg / VE185											
	0.225	0.500	0.223					ARG90	0.088(#3)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.43					VT (N) 0.55			CR 46
71	VE12M / air / Clear											
	0.223	0.500	0.225					AIR	0.040(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51			CR 46
	Clear / air / VE12M											
	0.225	0.500	0.223					AIR	0.040(#3)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.51			CR 46
72	VE12M / arg / Clear											
	0.223	0.500	0.225					ARG90	0.040(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51			CR 46
	Clear / arg / VE12M											
	0.225	0.500	0.223					ARG90	0.040(#3)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.51			CR 46
73	Comfort TiAC36 / air / Clear											
	0.222	0.500	0.225					AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.27					VT (N) 0.47			CR 46
	Clear / air / Comfort TiAC36											
	0.225	0.500	0.222					AIR	0.034(#3)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.47			CR 46
74	Comfort TiAC36 / arg / Clear											
	0.222	0.500	0.225					ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.47			CR 46
	Clear / arg / Comfort TiAC36											
	0.225	0.500	0.222					ARG90	0.034(#3)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.34					VT (N) 0.47			CR 46

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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	
75	Comfort TiAC23 / air / Clear											
	0.228	0.500	0.225					AIR	0.041(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.28		CR 46	
	Clear / air / Comfort TiAC23											
	0.225	0.500	0.228					AIR	0.041(#3)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.28		CR 46	
76	Comfort TiAC23 / arg / Clear											
	0.228	0.500	0.225					ARG90	0.041(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.28		CR 46	
	Clear / arg / Comfort TiAC23											
	0.225	0.500	0.228					ARG90	0.041(#3)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.35					VT (N) 0.28		CR 46	
77	Energy Advantage / air / Clear											
	0.222	0.500	0.223					AIR	0.157(#2)	CL	CU-D	N
	U-Factor 0.48			SHGC (N) 0.46					VT (N) 0.53		CR 46	
	Clear / air / Energy Advantage											
	0.223	0.500	0.222					AIR	0.157(#3)	CL	CU-D	N
	U-Factor 0.48			SHGC (N) 0.50					VT (N) 0.53		CR 46	
78	Energy Advantage / arg / Clear											
	0.222	0.500	0.223					ARG90	0.157(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.46					VT (N) 0.53		CR 46	
	Clear/ arg / Energy Advantage											
	0.223	0.500	0.222					ARG90	0.157(#3)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.50					VT (N) 0.53		CR 46	
79	Sungate 100 / air / Clear											
	0.223	0.500	0.223					AIR	0.087(#2)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / air / Sungate 100											
	0.223	0.500	0.223					AIR	0.087(#3)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.44					VT (N) 0.55		CR 46	

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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	
80	Sungate 100 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.087(#2)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / arg / Sungate 100											
	0.223	0.500	0.223					ARG90	0.087(#3)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.44					VT (N) 0.55		CR 46	
81	Solarban 80 / air / Clear											
	0.223	0.500	0.223					AIR	0.024(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.19					VT (N) 0.34		CR 46	
	Clear / air / Solarban 80											
	0.223	0.500	0.223					AIR	0.024(#3)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.22					VT (N) 0.34		CR 46	
82	Solarban 80 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.024(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.34		CR 46	
	Clear / arg / Solarban 80											
	0.223	0.500	0.223					ARG90	0.024(#3)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.22					VT (N) 0.34		CR 46	
83	Clear / air / Clear Laminate (030pvb)											
	0.225	0.500	0.266					AIR		CL	CU-D	N
	U-Factor 0.58			SHGC (N) 0.51					VT (N) 0.57		CR 44	
84	Clear / arg / Clear Laminate (030pvb)											
	0.225	0.500	0.266					ARG90		CL	CU-D	N
	U-Factor 0.56			SHGC (N) 0.51					VT (N) 0.57		CR 44	
85	Solarban 60 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.035(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51		CR 46	
86	Solarban 60 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.035(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51		CR 46	

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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	
87	Solarban 70XL / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.018(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.46		CR 46	
88	Solarban 70XL / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.018(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.21					VT (N) 0.46		CR 46	
89	VE185 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.088(#2)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.40					VT (N) 0.55		CR 46	
90	VE185 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.088(#2)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.55		CR 46	
91	VE12M / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.040(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51		CR 46	
92	VE12M / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.040(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51		CR 46	
93	Comfort TiAC36 / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.47		CR 46	
94	Comfort TiAC36 / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.47		CR 46	
95	Comfort TiAC23 / air / Clear Laminate (030pvb)											
	0.228	0.500	0.266					AIR	0.041(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.28		CR 46	
96	Comfort TiAC23 / arg / Clear Laminate (030pvb)											
	0.228	0.500	0.266					ARG90	0.041(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.17					VT (N) 0.28		CR 46	

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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	
97	Energy Advantage / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.157(#2)	CL	CU-D	N
	U-Factor 0.48			SHGC (N) 0.46					VT (N) 0.53		CR 45	
98	Energy Advantage / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.157(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.46					VT (N) 0.53		CR 46	
99	Sungate 100 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.087(#2)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.40					VT (N) 0.55		CR 46	
100	Sungate 100 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.087(#2)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.55		CR 46	
101	Solarban 80 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.024(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.34		CR 46	
102	Solarban 80 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.024(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.34		CR 46	
103	Clear / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR		CL	CU-D	N
	U-Factor 0.56			SHGC (N) 0.50					VT (N) 0.55		CR 45	
104	Clear / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90		CL	CU-D	N
	U-Factor 0.55			SHGC (N) 0.50					VT (N) 0.55		CR 45	
105	Solarban 60 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.035(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 47	
106	Solarban 60 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.035(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 47	

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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	
107	Solarban 70XL / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.018(#2)	CL	CU-D	N
	U-Factor 0.44			SHGC (N) 0.21					VT (N) 0.44		CR 47	
108	Solarban 70XL / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.018(#2)	CL	CU-D	N
	U-Factor 0.41			SHGC (N) 0.21					VT (N) 0.44		CR 47	
109	VE185 / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.088(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 47	
110	VE185 / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.088(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.53		CR 47	
111	VE12M / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.040(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 47	
112	VE12M / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.040(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 47	
113	Comfort TiAC36 / air / Clear Laminate (090sgp)											
	0.187	0.500	0.536					AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.46		CR 47	
114	Comfort TiAC36 / arg / Clear Laminate (090sgp)											
	0.187	0.500	0.536					ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.46		CR 47	
115	Comfort TiAC23 / air / Clear Laminate (090sgp)											
	0.197	0.500	0.536					AIR	0.039(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.27		CR 47	
116	Comfort TiAC23 / arg / Clear Laminate (090sgp)											
	0.197	0.500	0.536					ARG90	0.039(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.17					VT (N) 0.27		CR 47	

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Series 8000 Single Hung

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	
117	Energy Advantage / air / Clear Laminate (090sgp)											
	0.186	0.500	0.536					AIR	0.158(#2)	CL	CU-D	N
	U-Factor 0.47			SHGC (N) 0.45					VT (N) 0.51		CR 46	
118	Energy Advantage / arg / Clear Laminate (090sgp)											
	0.186	0.500	0.536					ARG90	0.158(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.45					VT (N) 0.51		CR 47	
119	Sungate 100 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.087(#2)	CL	CU-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 47	
120	Sungate 100 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.087(#2)	CL	CU-D	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.53		CR 47	
121	Solarban 80 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.024(#2)	CL	CU-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.33		CR 47	
122	Solarban 80 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.024(#2)	CL	CU-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.33		CR 47	
123	Clear / air / Clear											
	0.225	0.500	0.225					AIR		CL	SS-D	N
	U-Factor 0.58			SHGC (N) 0.52					VT (N) 0.57		CR 42	
124	Clear / arg / Clear											
	0.225	0.500	0.225					ARG90		CL	SS-D	N
	U-Factor 0.57			SHGC (N) 0.52					VT (N) 0.57		CR 43	
125	Solarban 60 / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 44	
	Clear / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.51		CR 44	

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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	
126	Solarban 60 on Atlantica / air / Clear											
	0.223	0.500	0.223					AIR	0.035(#2)	GR	SS-D	N
	U-Factor 0.46			SHGC (N) 0.21				VT (N) 0.39			CR 44	
	Atlantica / air / Solarban 60											
	0.223	0.500	0.223					AIR	0.035(#3)	GR	SS-D	N
	U-Factor 0.46			SHGC (N) 0.23				VT (N) 0.39			CR 44	
	Solarban 60 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.035(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.51			CR 45	
	Clear / arg / Solarban 60											
	0.223	0.500	0.223					ARG90	0.035(#3)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.34				VT (N) 0.51			CR 45	
127	Solarban 60 on Atlantica / arg / Clear											
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	SS-D	N
	U-Factor 0.43			SHGC (N) 0.20				VT (N) 0.39			CR 45	
	Atlantica / arg / Solarban 60											
	0.223	0.500	0.223					ARG90	0.035(#3)	GR	SS-D	N
	U-Factor 0.43			SHGC (N) 0.23				VT (N) 0.39			CR 45	
	Solarban 70XL / air / Clear											
	0.223	0.500	0.223					AIR	0.018(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.21				VT (N) 0.47			CR 44	
	Clear / air / Solarban 70XL											
	0.223	0.500	0.223					AIR	0.018(#3)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.28				VT (N) 0.47			CR 44	
128	Solarban 70XL / arg / Clear											
	0.223	0.500	0.223					ARG90	0.018(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.47			CR 45	
	Clear / arg / Solarban 70XL											
	0.223	0.500	0.223					ARG90	0.018(#3)	CL	SS-D	N
U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.47			CR 45		

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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	
129	VE185 / air / Clear											
	0.223	0.500	0.225					AIR	0.088(#2)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.41					VT (N) 0.55		CR 44	
	Clear / air / VE185											
	0.225	0.500	0.223					AIR	0.088(#3)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.43					VT (N) 0.55		CR 44	
130	VE185 / arg / Clear											
	0.223	0.500	0.225					ARG90	0.088(#2)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.41					VT (N) 0.55		CR 45	
	Clear / arg / VE185											
	0.225	0.500	0.223					ARG90	0.088(#3)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.43					VT (N) 0.55		CR 45	
131	VE12M / air / Clear											
	0.223	0.500	0.225					AIR	0.040(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.29					VT (N) 0.51		CR 44	
	Clear / air / VE12M											
	0.225	0.500	0.223					AIR	0.040(#3)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.51		CR 44	
132	VE12M / arg / Clear											
	0.223	0.500	0.225					ARG90	0.040(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.28					VT (N) 0.51		CR 45	
	Clear / arg / VE12M											
	0.225	0.500	0.223					ARG90	0.040(#3)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.51		CR 45	
133	Comfort TiAC36 / air / Clear											
	0.222	0.500	0.225					AIR	0.034(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.27					VT (N) 0.47		CR 44	
	Clear / air / Comfort TiAC36											
	0.225	0.500	0.222					AIR	0.034(#3)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.47		CR 44	

NFRC 100/200/500 Summary Sheet
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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		
134	Comfort TiAC36 / arg / Clear												
	0.222	0.500	0.225					ARG90	0.034(#2)	CL	SS-D	N	
	U-Factor 0.43			SHGC (N) 0.27					VT (N) 0.47		CR 45		
	Clear / arg / Comfort TiAC36												
	0.225	0.500	0.222					ARG90	0.034(#3)	CL	SS-D	N	
	U-Factor 0.43			SHGC (N) 0.34					VT (N) 0.47		CR 45		
	135	Comfort TiAC23 / air / Clear											
		0.228	0.500	0.225					AIR	0.041(#2)	CL	SS-D	N
U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.28		CR 44			
Clear / air / Comfort TiAC23													
	0.225	0.500	0.228					AIR	0.041(#3)	CL	SS-D	N	
	U-Factor 0.46			SHGC (N) 0.34					VT (N) 0.28		CR 44		
	136	Comfort TiAC23 / arg / Clear											
		0.228	0.500	0.225					ARG90	0.041(#2)	CL	SS-D	N
U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.28		CR 45			
Clear / arg / Comfort TiAC23													
	0.225	0.500	0.228					ARG90	0.041(#3)	CL	SS-D	N	
	U-Factor 0.43			SHGC (N) 0.35					VT (N) 0.28		CR 45		
	137	Energy Advantage / air / Clear											
		0.222	0.500	0.223					AIR	0.157(#2)	CL	SS-D	N
U-Factor 0.49			SHGC (N) 0.46					VT (N) 0.53		CR 44			
Clear / air / Energy Advantage													
	0.223	0.500	0.222					AIR	0.157(#3)	CL	SS-D	N	
	U-Factor 0.49			SHGC (N) 0.50					VT (N) 0.53		CR 44		
	138	Energy Advantage / arg / Clear											
		0.222	0.500	0.223					ARG90	0.157(#2)	CL	SS-D	N
U-Factor 0.46			SHGC (N) 0.46					VT (N) 0.53		CR 44			
Clear/ arg / Energy Advantage													
	0.223	0.500	0.222					ARG90	0.157(#3)	CL	SS-D	N	
	U-Factor 0.46			SHGC (N) 0.50					VT (N) 0.53		CR 44		

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Series 8000 Single Hung

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	
139	Sungate 100 / air / Clear											
	0.223	0.500	0.223					AIR	0.087(#2)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.41					VT (N) 0.55		CR 44	
	Clear / air / Sungate 100											
	0.223	0.500	0.223					AIR	0.087(#3)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.44					VT (N) 0.55		CR 44	
140	Sungate 100 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.087(#2)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.41					VT (N) 0.55		CR 45	
	Clear / arg / Sungate 100											
	0.223	0.500	0.223					ARG90	0.087(#3)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.44					VT (N) 0.55		CR 45	
141	Solarban 80 / air / Clear											
	0.223	0.500	0.223					AIR	0.024(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.19					VT (N) 0.34		CR 44	
	Clear / air / Solarban 80											
	0.223	0.500	0.223					AIR	0.024(#3)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.22					VT (N) 0.34		CR 44	
142	Solarban 80 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.024(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.18					VT (N) 0.34		CR 45	
	Clear / arg / Solarban 80											
	0.223	0.500	0.223					ARG90	0.024(#3)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.22					VT (N) 0.34		CR 45	
143	Clear / air / Clear Laminate (030pvb)											
	0.225	0.500	0.266					AIR		CL	SS-D	N
	U-Factor 0.58			SHGC (N) 0.51					VT (N) 0.57		CR 43	
144	Clear / arg / Clear Laminate (030pvb)											
	0.225	0.500	0.266					ARG90		CL	SS-D	N
	U-Factor 0.56			SHGC (N) 0.51					VT (N) 0.57		CR 43	

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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	
145	Solarban 60 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.035(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.29				VT (N) 0.51			CR 44	
146	Solarban 60 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.035(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.28				VT (N) 0.51			CR 45	
147	Solarban 70XL / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.018(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.21				VT (N) 0.46			CR 44	
148	Solarban 70XL / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.018(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.21				VT (N) 0.46			CR 45	
149	VE185 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.088(#2)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.40				VT (N) 0.55			CR 44	
150	VE185 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.088(#2)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.40				VT (N) 0.55			CR 44	
151	VE12M / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.040(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.29				VT (N) 0.51			CR 44	
152	VE12M / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.040(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.28				VT (N) 0.51			CR 45	
153	Comfort TiAC36 / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.034(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.27				VT (N) 0.47			CR 44	
154	Comfort TiAC36 / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.034(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.27				VT (N) 0.47			CR 45	

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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	
155	Comfort TiAC23 / air / Clear Laminate (030pvb)											
	0.228	0.500	0.266					AIR	0.041(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.18					VT (N) 0.28		CR 44	
156	Comfort TiAC23 / arg / Clear Laminate (030pvb)											
	0.228	0.500	0.266					ARG90	0.041(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.17					VT (N) 0.28		CR 45	
157	Energy Advantage / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.157(#2)	CL	SS-D	N
	U-Factor 0.48			SHGC (N) 0.46					VT (N) 0.53		CR 44	
158	Energy Advantage / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.157(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.46					VT (N) 0.53		CR 44	
159	Sungate 100 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.087(#2)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.40					VT (N) 0.55		CR 44	
160	Sungate 100 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.087(#2)	CL	SS-D	N
	U-Factor 0.44			SHGC (N) 0.40					VT (N) 0.55		CR 44	
161	Solarban 80 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.024(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.34		CR 44	
162	Solarban 80 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.024(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.34		CR 45	
163	Clear / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR		CL	SS-D	N
	U-Factor 0.56			SHGC (N) 0.50					VT (N) 0.55		CR 43	
164	Clear / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90		CL	SS-D	N
	U-Factor 0.55			SHGC (N) 0.50					VT (N) 0.55		CR 44	

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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	
165	Solarban 60 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.035(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 46	
166	Solarban 60 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.035(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 46	
167	Solarban 70XL / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.018(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.44		CR 46	
168	Solarban 70XL / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.018(#2)	CL	SS-D	N
	U-Factor 0.41			SHGC (N) 0.21					VT (N) 0.44		CR 46	
169	VE185 / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.088(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 45	
170	VE185 / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.088(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.53		CR 46	
171	VE12M / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.040(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.49		CR 46	
172	VE12M / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.040(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.49		CR 46	
173	Comfort TiAC36 / air / Clear Laminate (090sgp)											
	0.187	0.500	0.536					AIR	0.034(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.46		CR 46	
174	Comfort TiAC36 / arg / Clear Laminate (090sgp)											
	0.187	0.500	0.536					ARG90	0.034(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.46		CR 46	

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
175	Comfort TiAC23 / air / Clear Laminate (090sgp)											
	0.197	0.500	0.536					AIR	0.039(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.27		CR 46	
176	Comfort TiAC23 / arg / Clear Laminate (090sgp)											
	0.197	0.500	0.536					ARG90	0.039(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.17					VT (N) 0.27		CR 46	
177	Energy Advantage / air / Clear Laminate (090sgp)											
	0.186	0.500	0.536					AIR	0.158(#2)	CL	SS-D	N
	U-Factor 0.47			SHGC (N) 0.45					VT (N) 0.51		CR 45	
178	Energy Advantage / arg / Clear Laminate (090sgp)											
	0.186	0.500	0.536					ARG90	0.158(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.45					VT (N) 0.51		CR 46	
179	Sungate 100 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.087(#2)	CL	SS-D	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.53		CR 45	
180	Sungate 100 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.087(#2)	CL	SS-D	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.53		CR 46	
181	Solarban 80 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.024(#2)	CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.33		CR 46	
182	Solarban 80 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.024(#2)	CL	SS-D	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.33		CR 46	
183	Clear / air / Clear											
	0.225	0.500	0.225					AIR		CL	OF-S	N
	U-Factor 0.58			SHGC (N) 0.52					VT (N) 0.57		CR 43	
184	Clear / arg / Clear											
	0.225	0.500	0.225					ARG90		CL	OF-S	N
	U-Factor 0.56			SHGC (N) 0.52					VT (N) 0.57		CR 44	

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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	
185	Solarban 60 / air / Clear												
	0.223	0.500	0.223					AIR	0.035(#2)	CL	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51			CR 46	
	Clear / air / Solarban 60												
	0.223	0.500	0.223					AIR	0.035(#3)	CL	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.34					VT (N) 0.51			CR 46	
	Solarban 60 on Atlantica / air / Clear												
	0.223	0.500	0.223					AIR	0.035(#2)	GR	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.39			CR 46	
	Atlantica / air / Solarban 60												
	0.223	0.500	0.223					AIR	0.035(#3)	GR	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.23					VT (N) 0.39			CR 46	
186	Solarban 60 / arg / Clear												
	0.223	0.500	0.223					ARG90	0.035(#2)	CL	OF-S	N	
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51			CR 46	
	Clear / arg / Solarban 60												
	0.223	0.500	0.223					ARG90	0.035(#3)	CL	OF-S	N	
	U-Factor 0.42			SHGC (N) 0.34					VT (N) 0.51			CR 46	
	Solarban 60 on Atlantica / arg / Clear												
	0.223	0.500	0.223					ARG90	0.035(#2)	GR	OF-S	N	
	U-Factor 0.42			SHGC (N) 0.20					VT (N) 0.39			CR 46	
	Atlantica / arg / Solarban 60												
	0.223	0.500	0.223					ARG90	0.035(#3)	GR	OF-S	N	
	U-Factor 0.42			SHGC (N) 0.23					VT (N) 0.39			CR 46	
187	Solarban 70XL / air / Clear												
	0.223	0.500	0.223					AIR	0.018(#2)	CL	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.21					VT (N) 0.47			CR 46	
	Clear / air / Solarban 70XL												
	0.223	0.500	0.223					AIR	0.018(#3)	CL	OF-S	N	
	U-Factor 0.45			SHGC (N) 0.28					VT (N) 0.47			CR 46	

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Series 8000 Single Hung

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	
188	Solarban 70XL / arg / Clear											
	0.223	0.500	0.223					ARG90	0.018(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.21					VT (N) 0.47		CR 46	
	Clear / arg / Solarban 70XL											
	0.223	0.500	0.223					ARG90	0.018(#3)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.28					VT (N) 0.47		CR 46	
	Clear / air / Clear											
189	VE185 / air / Clear											
	0.223	0.500	0.225					AIR	0.088(#2)	CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / air / VE185											
	0.225	0.500	0.223					AIR	0.088(#3)	CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.43					VT (N) 0.55		CR 46	
	Clear / arg / VE185											
190	VE185 / arg / Clear											
	0.223	0.500	0.225					ARG90	0.088(#2)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / arg / VE185											
	0.225	0.500	0.223					ARG90	0.088(#3)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.43					VT (N) 0.55		CR 46	
	Clear / air / Clear											
191	VE12M / air / Clear											
	0.223	0.500	0.225					AIR	0.040(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51		CR 46	
	Clear / air / VE12M											
	0.225	0.500	0.223					AIR	0.040(#3)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.34					VT (N) 0.51		CR 46	
	Clear / arg / Clear											
192	VE12M / arg / Clear											
	0.223	0.500	0.225					ARG90	0.040(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51		CR 46	
	Clear / arg / VE12M											
	0.225	0.500	0.223					ARG90	0.040(#3)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.34					VT (N) 0.51		CR 46	

NFRC 100/200/500 Summary Sheet
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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
193	Comfort TiAC36 / air / Clear											
	0.222	0.500	0.225					AIR	0.034(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.47			CR 46
	Clear / air / Comfort TiAC36											
	0.225	0.500	0.222					AIR	0.034(#3)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.34					VT (N) 0.47			CR 46
194	Comfort TiAC36 / arg / Clear											
	0.222	0.500	0.225					ARG90	0.034(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.47			CR 46
	Clear / arg / Comfort TiAC36											
	0.225	0.500	0.222					ARG90	0.034(#3)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.34					VT (N) 0.47			CR 46
195	Comfort TiAC23 / air / Clear											
	0.228	0.500	0.225					AIR	0.041(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.28			CR 46
	Clear / air / Comfort TiAC23											
	0.225	0.500	0.228					AIR	0.041(#3)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.34					VT (N) 0.28			CR 46
196	Comfort TiAC23 / arg / Clear											
	0.228	0.500	0.225					ARG90	0.041(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.28			CR 46
	Clear / arg / Comfort TiAC23											
	0.225	0.500	0.228					ARG90	0.041(#3)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.35					VT (N) 0.28			CR 46
197	Energy Advantage / air / Clear											
	0.222	0.500	0.223					AIR	0.157(#2)	CL	OF-S	N
	U-Factor 0.48			SHGC (N) 0.46					VT (N) 0.53			CR 45
	Clear / air / Energy Advantage											
	0.223	0.500	0.222					AIR	0.157(#3)	CL	OF-S	N
	U-Factor 0.48			SHGC (N) 0.50					VT (N) 0.53			CR 45

NFRC 100/200/500 Summary Sheet

Series 8000 Single Hung

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	
198	Energy Advantage / arg / Clear											
	0.222	0.500	0.223					ARG90	0.157(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.46					VT (N) 0.53		CR 46	
	Clear/ arg / Energy Advantage											
	0.223	0.500	0.222					ARG90	0.157(#3)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.50					VT (N) 0.53		CR 46	
	Sungate 100 / air / Clear											
	0.223	0.500	0.223					AIR	0.087(#2)	CL	OF-S	N
199	U-Factor 0.46			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / air / Sungate 100											
	0.223	0.500	0.223					AIR	0.087(#3)	CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.44					VT (N) 0.55		CR 46	
200	Sungate 100 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.087(#2)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.41					VT (N) 0.55		CR 46	
	Clear / arg / Sungate 100											
	0.223	0.500	0.223					ARG90	0.087(#3)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.44					VT (N) 0.55		CR 46	
	Solarban 80 / air / Clear											
	0.223	0.500	0.223					AIR	0.024(#2)	CL	OF-S	N
201	U-Factor 0.45			SHGC (N) 0.19					VT (N) 0.34		CR 46	
	Clear / air / Solarban 80											
	0.223	0.500	0.223					AIR	0.024(#3)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.22					VT (N) 0.34		CR 46	
202	Solarban 80 / arg / Clear											
	0.223	0.500	0.223					ARG90	0.024(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.18					VT (N) 0.34		CR 46	
	Clear / arg / Solarban 80											
	0.223	0.500	0.223					ARG90	0.024(#3)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.22					VT (N) 0.34		CR 46	

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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	
203	Clear / air / Clear Laminate (030pvb)											
	0.225	0.500	0.266					AIR		CL	OF-S	N
	U-Factor 0.57			SHGC (N) 0.51					VT (N) 0.57		CR 43	
204	Clear / arg / Clear Laminate (030pvb)											
	0.225	0.500	0.266					ARG90		CL	OF-S	N
	U-Factor 0.55			SHGC (N) 0.51					VT (N) 0.57		CR 45	
205	Solarban 60 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.035(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51		CR 45	
206	Solarban 60 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.035(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51		CR 46	
207	Solarban 70XL / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.018(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.21					VT (N) 0.46		CR 46	
208	Solarban 70XL / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.018(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.21					VT (N) 0.46		CR 46	
209	VE185 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.088(#2)	CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.55		CR 45	
210	VE185 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.088(#2)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.55		CR 46	
211	VE12M / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.040(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.29					VT (N) 0.51		CR 45	
212	VE12M / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.040(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.28					VT (N) 0.51		CR 46	

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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	
213	Comfort TiAC36 / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.034(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.27					VT (N) 0.47		CR 45	
214	Comfort TiAC36 / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.034(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.27					VT (N) 0.47		CR 46	
215	Comfort TiAC23 / air / Clear Laminate (030pvb)											
	0.228	0.500	0.266					AIR	0.041(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.18					VT (N) 0.28		CR 45	
216	Comfort TiAC23 / arg / Clear Laminate (030pvb)											
	0.228	0.500	0.266					ARG90	0.041(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.17					VT (N) 0.28		CR 46	
217	Energy Advantage / air / Clear Laminate (030pvb)											
	0.222	0.500	0.266					AIR	0.157(#2)	CL	OF-S	N
	U-Factor 0.47			SHGC (N) 0.46					VT (N) 0.53		CR 45	
218	Energy Advantage / arg / Clear Laminate (030pvb)											
	0.222	0.500	0.266					ARG90	0.157(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.46					VT (N) 0.53		CR 46	
219	Sungate 100 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.087(#2)	CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.40					VT (N) 0.55		CR 45	
220	Sungate 100 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.087(#2)	CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.40					VT (N) 0.55		CR 46	
221	Solarban 80 / air / Clear Laminate (030pvb)											
	0.223	0.500	0.266					AIR	0.024(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.18					VT (N) 0.34		CR 45	
222	Solarban 80 / arg / Clear Laminate (030pvb)											
	0.223	0.500	0.266					ARG90	0.024(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.18					VT (N) 0.34		CR 46	

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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	
223	Clear / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR		CL	OF-S	N
	U-Factor		0.56	SHGC (N)				0.50	VT (N)		0.55	CR
224	Clear / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90		CL	OF-S	N
	U-Factor		0.54	SHGC (N)				0.50	VT (N)		0.55	CR
225	Solarban 60 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.035(#2)	CL	OF-S	N
	U-Factor		0.44	SHGC (N)				0.28	VT (N)		0.49	CR
226	Solarban 60 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.035(#2)	CL	OF-S	N
	U-Factor		0.41	SHGC (N)				0.28	VT (N)		0.49	CR
227	Solarban 70XL / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.018(#2)	CL	OF-S	N
	U-Factor		0.44	SHGC (N)				0.21	VT (N)		0.44	CR
228	Solarban 70XL / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.018(#2)	CL	OF-S	N
	U-Factor		0.41	SHGC (N)				0.21	VT (N)		0.44	CR
229	VE185 / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.088(#2)	CL	OF-S	N
	U-Factor		0.45	SHGC (N)				0.40	VT (N)		0.53	CR
230	VE185 / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.088(#2)	CL	OF-S	N
	U-Factor		0.42	SHGC (N)				0.40	VT (N)		0.53	CR
231	VE12M / air / Clear Laminate (090sgp)											
	0.185	0.500	0.536					AIR	0.040(#2)	CL	OF-S	N
	U-Factor		0.44	SHGC (N)				0.28	VT (N)		0.49	CR
232	VE12M / arg / Clear Laminate (090sgp)											
	0.185	0.500	0.536					ARG90	0.040(#2)	CL	OF-S	N
	U-Factor		0.41	SHGC (N)				0.28	VT (N)		0.49	CR

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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	
233	Comfort TiAC36 / air / Clear Laminate (090sgp)											
	0.187	0.500	0.536					AIR	0.034(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.27					VT (N) 0.46		CR 47	
234	Comfort TiAC36 / arg / Clear Laminate (090sgp)											
	0.187	0.500	0.536					ARG90	0.034(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.27					VT (N) 0.46		CR 47	
235	Comfort TiAC23 / air / Clear Laminate (090sgp)											
	0.197	0.500	0.536					AIR	0.039(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.18					VT (N) 0.27		CR 47	
236	Comfort TiAC23 / arg / Clear Laminate (090sgp)											
	0.197	0.500	0.536					ARG90	0.039(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.17					VT (N) 0.27		CR 47	
237	Energy Advantage / air / Clear Laminate (090sgp)											
	0.186	0.500	0.536					AIR	0.158(#2)	CL	OF-S	N
	U-Factor 0.47			SHGC (N) 0.45					VT (N) 0.51		CR 46	
238	Energy Advantage / arg / Clear Laminate (090sgp)											
	0.186	0.500	0.536					ARG90	0.158(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.45					VT (N) 0.51		CR 47	
239	Sungate 100 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.087(#2)	CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.40					VT (N) 0.53		CR 46	
240	Sungate 100 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.087(#2)	CL	OF-S	N
	U-Factor 0.42			SHGC (N) 0.40					VT (N) 0.53		CR 47	
241	Solarban 80 / air / Clear Laminate (090sgp)											
	0.184	0.500	0.536					AIR	0.024(#2)	CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.18					VT (N) 0.33		CR 47	
242	Solarban 80 / arg / Clear Laminate (090sgp)											
	0.184	0.500	0.536					ARG90	0.024(#2)	CL	OF-S	N
	U-Factor 0.41			SHGC (N) 0.18					VT (N) 0.33		CR 47	

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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	
243	Comfort TiAC36 / air / Clear / air / Clear											
	0.118	0.500	0.123	0.500	0.123			AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.26					VT (N) 0.45		CR 47	
244	Comfort TiAC36 / arg / Clear / arg / Clear											
	0.118	0.500	0.123	0.500	0.123			ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.37			SHGC (N) 0.26					VT (N) 0.45		CR 47	
245	Clear / air / Clear / air / Clear											
	0.123	0.500	0.123	0.500	0.123			AIR		CL	OF-S	N
	U-Factor 0.46			SHGC (N) 0.53					VT (N) 0.54		CR 47	
246	Clear / arg / Clear / arg / Clear											
	0.123	0.500	0.123	0.500	0.123			ARG90		CL	OF-S	N
	U-Factor 0.44			SHGC (N) 0.53					VT (N) 0.54		CR 47	
247	Comfort TiAC36 / air / Clear / air / Clear											
	0.087	0.563	0.086	0.563	0.086			AIR	0.034(#2)	CL	CU-D	N
	U-Factor 0.40			SHGC (N) 0.26					VT (N) 0.46		CR 47	
248	Comfort TiAC36 / arg / Clear / arg / Clear											
	0.087	0.563	0.086	0.563	0.086			ARG90	0.034(#2)	CL	CU-D	N
	U-Factor 0.37			SHGC (N) 0.26					VT (N) 0.46		CR 47	
249	Clear / air / Clear / air / Clear											
	0.086	0.563	0.086	0.563	0.086			AIR		CL	OF-S	N
	U-Factor 0.45			SHGC (N) 0.54					VT (N) 0.55		CR 47	
250	Clear / arg / Clear / arg / Clear											
	0.086	0.563	0.086	0.563	0.086			ARG90		CL	OF-S	N
	U-Factor 0.43			SHGC (N) 0.54					VT (N) 0.55		CR 47	
251	Solarban 70XL / air / Clear / air / Clear											
	0.129	0.500	0.129	0.500	0.129			AIR	0.018(#2)	CL	CU-D	N
	U-Factor 0.39			SHGC (N) 0.20					VT (N) 0.42		CR 47	
252	Solarban 70XL / arg / Clear / arg / Clear											
	0.129	0.500	0.129	0.500	0.129			ARG90	0.018(#2)	CL	CU-D	N
	U-Factor 0.37			SHGC (N) 0.19					VT (N) 0.42		CR 47	

NFRC 100/200/500 Summary Sheet
Series 8000 Single Hung

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		
253	Comfort TiAC23 / air / Clear / air / Clear												
	0.122	0.500	0.123	0.500	0.123			AIR	0.040(#2)	CL	CU-D	N	
	U-Factor		0.40	SHGC (N)			0.17		VT (N)		0.26		CR
254	Comfort TiAC23 / arg / Clear / arg / Clear												
	0.122	0.500	0.123	0.500	0.123			ARG90	0.040(#2)	CL	CU-D	N	
	U-Factor		0.38	SHGC (N)			0.16		VT (N)		0.26		CR
255	Bronze TiAC40 / air / Clear Laminate (030pvb)												
	0.224	0.500	0.266					AIR	0.045(#2)	BZ	A1-D	N	
	U-Factor		0.46	SHGC (N)			0.20		VT (N)		0.28		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.

Architectural Testing is an NFRC accredited simulation laboratory and all simulations were conducted in full compliance with NFRC approved procedures and specifications. The NFRC procedure requires that the computational results be verified through actual test results.

Detailed drawings, simulation data files, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing, Inc. for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are simulated values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the product simulated. This report may not be reproduced, except in full, without the written approval of Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC.:

SIMULATED BY:

REVIEWED BY:

Jason A. Mitzel
Simulation Technician

Kristen L. Livelsberger
Senior Simulation Technician
Simulator-In-Responsible-Charge

JAM:jam
99402.02-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (25)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01R0	5/13/2010	All	Original Report Issued
.01R1	6/3/2010	All	Revised super spacer code type
.02 R0	7/20/2010	All	Simulated Product as Fully Debridged Removed Option #243 Re-numbered Remaining Options
.02 R1	7/22/2010	All Appendix A	Changed Company Name Crossed out references to Skip-N-Debridge

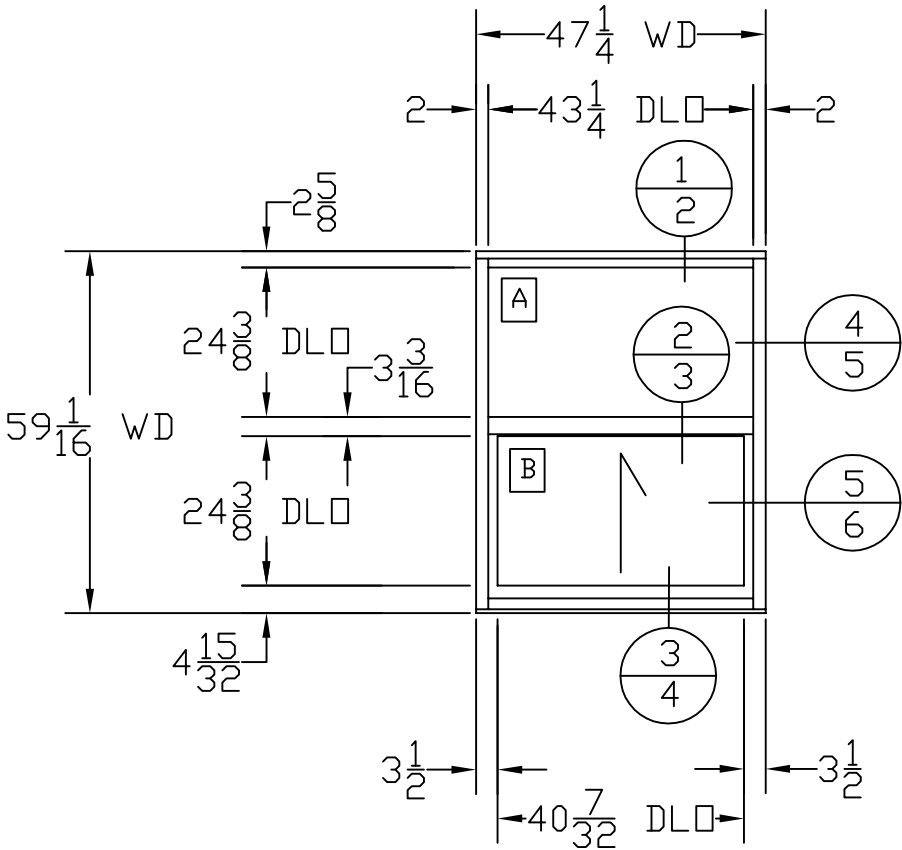


All drawings and Bills of Material used to simulate this product are enclosed in this Appendix

Appendix A

99402.02-116-45

SYM	REVISION	DATE	BY



A
TEST UNIT 1
QTY = 1

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen R. Luedsinger*

TEST REQUIREMENTS

AAMA PERFORMANCE TEST:
(AAMA 1503)
 <THERMAL TRANSMITTANCE (U-FACTOR) U = XX
 <U CLASS> U = XX
 <CONDENSATION RESISTANCE FACTOR FRAME (CRF f) XX CRF
 <CONDENSATION RESISTANCE FACTOR GLASS (CRF g) XX CRF
 <CRF CLASS> XX CRF
(AAMA 507)

NFRC PERFORMANCE TEST:

 (NFRC 102) U_s = XX
 U_{st} = XX

 (NFRC 100) CR = XX
 (NFRC 200)
 (NFRC 500)

SYMBOL KEY			
SYMBOL	DESCRIPTION	QTY	COMMENTS
A	45-¼" X 26-⅜"	1	1" INS ¼" TIAC36, ½" ALUM SS ARG, ¼" CLEAR
B	42-¼" X 26-⅜"	1	1" INS ¼" TIAC36, ½" ALUM SS ARG, ¼" CLEAR

THIS SPACE RESERVED FOR STRUCTURAL ENGINEER

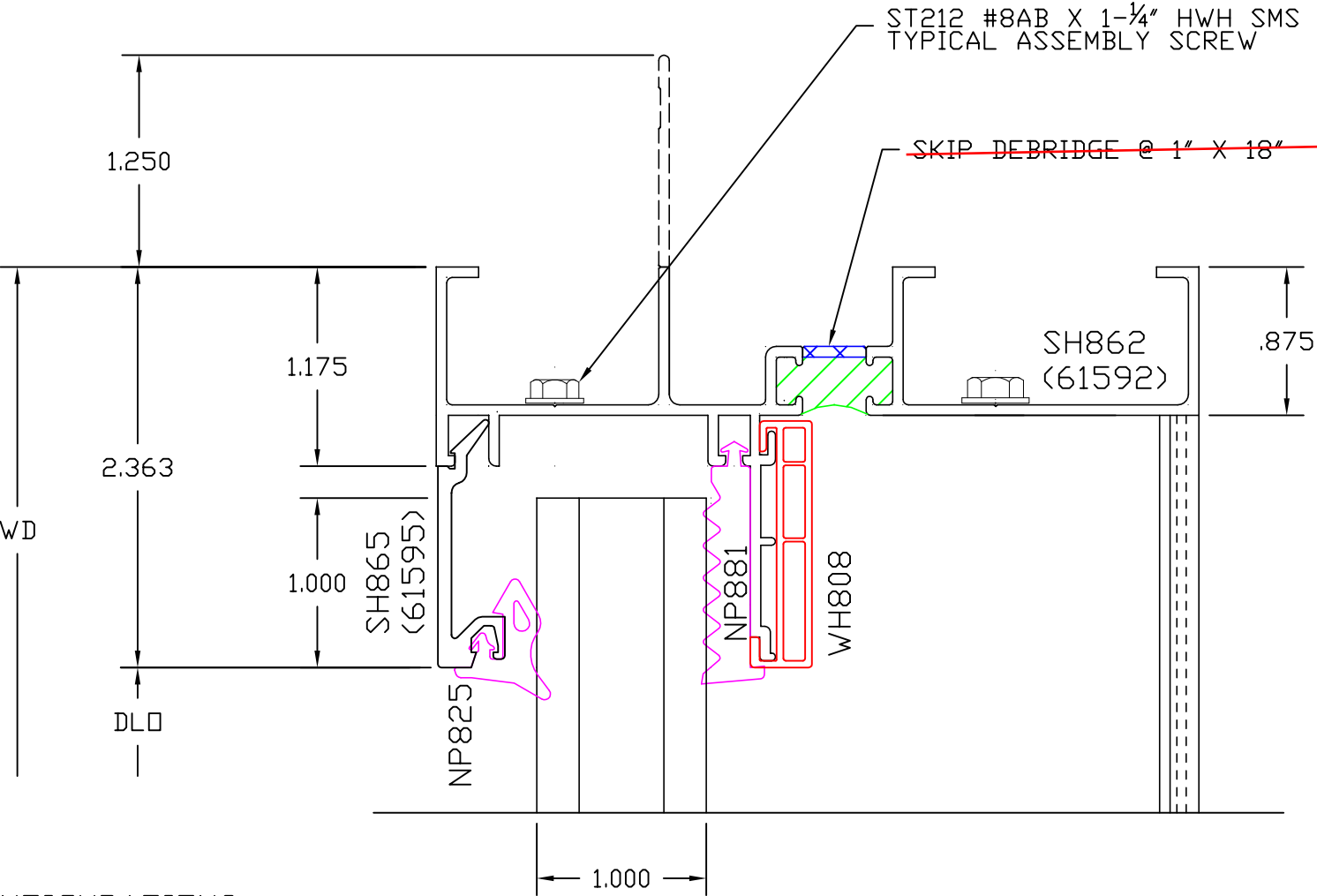
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United States Aluminum

- 720 Cel-River Road
Rock Hill, SC 29730
- 200 Singleton Drive
Waxahachie, TX 75165

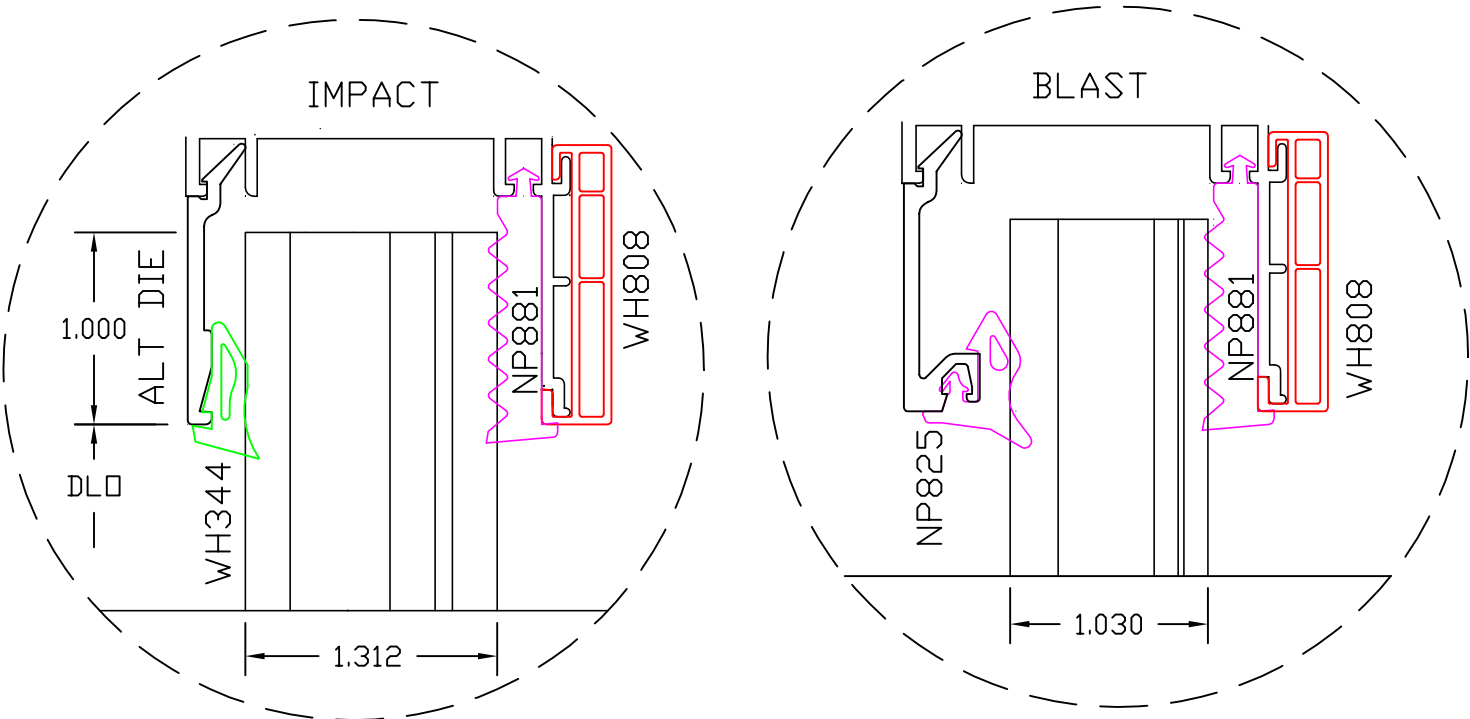
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DATE 02.22.10	DESCRIPTION ELEVATIONS	
SCALE 3/8" = 1'	DRAWING NO. 80SH-035	SHEET 1 OF 6

SYM	REVISION	DATE	BY



1

ALTERNATE GLAZING CONFIGURATIONS



ATI

Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen R. Lindelberger*

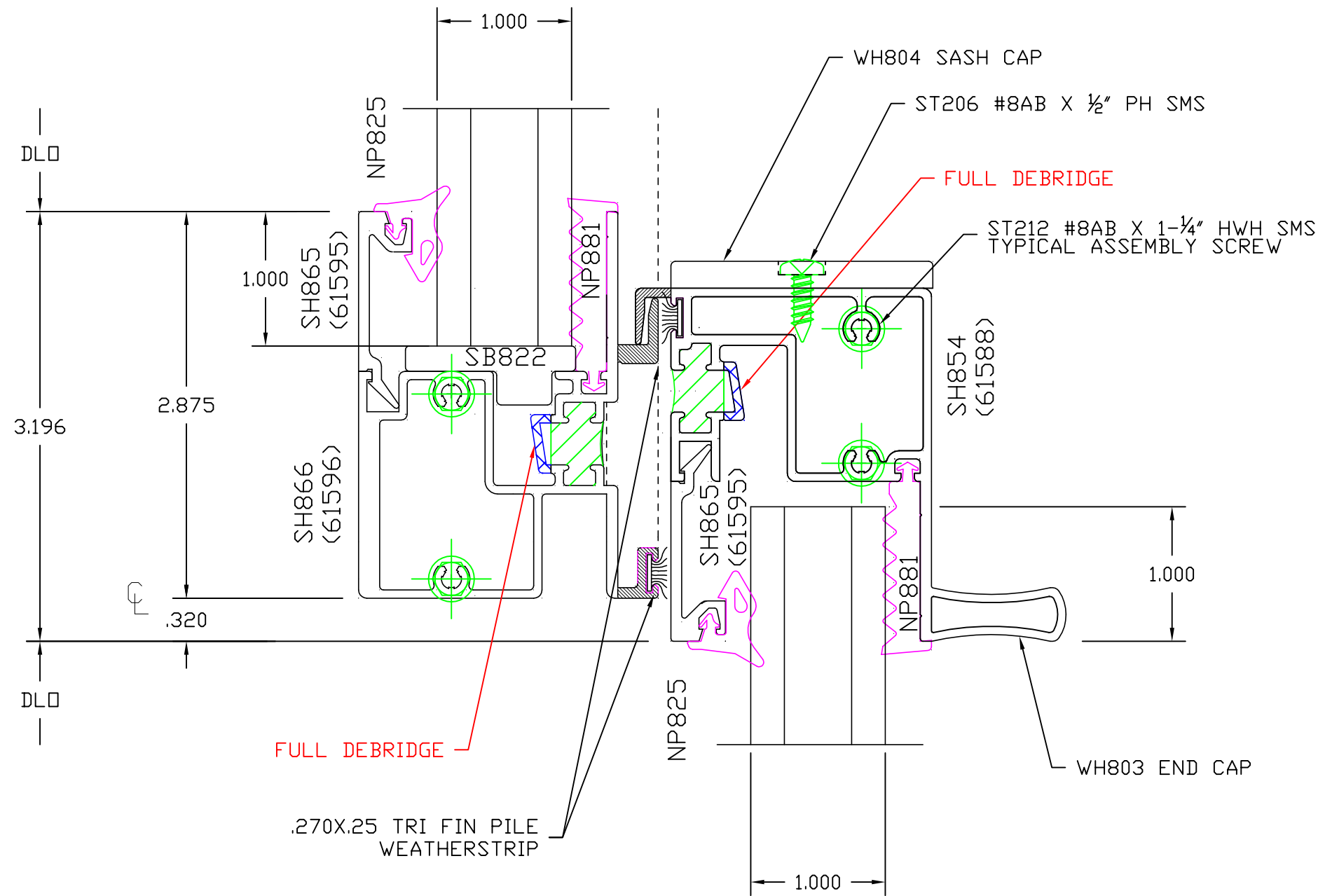
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THIS SPACE RESERVED FOR METRO-DADE USE ONLY

United States Aluminum 720 Cel-River Road Rock Hill, SC 29730 200 Singleton Drive Waxahachie, TX 75165		
DRAWN BY DCW	SYSTEM SERIES 8000 SINGLE HUNG WINDOW	
DATE 02.22.10	DESCRIPTION DETAILS	
APPVD BY	DRAWING NO. 80SH-035	SHEET 2 OF 6

SYM	REVISION	DATE	BY



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DRAWN BY DCW	SYSTEM SERIES 8000 SINGLE HUNG WINDOW	
DATE 02.22.10	DESCRIPTION DETAILS	
APPVD BY	DRAWING NO. 80SH-035	SHEET 3 OF 6

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen R. Linderberger*

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DRAWN BY DCW	SYSTEM SERIES 8000 SINGLE HUNG WINDOW	
DATE 02.22.10	DESCRIPTION DETAILS	
APPVD BY	DRAWING NO.	SHEET 4 OF 6
SCALE FULL		

ATI

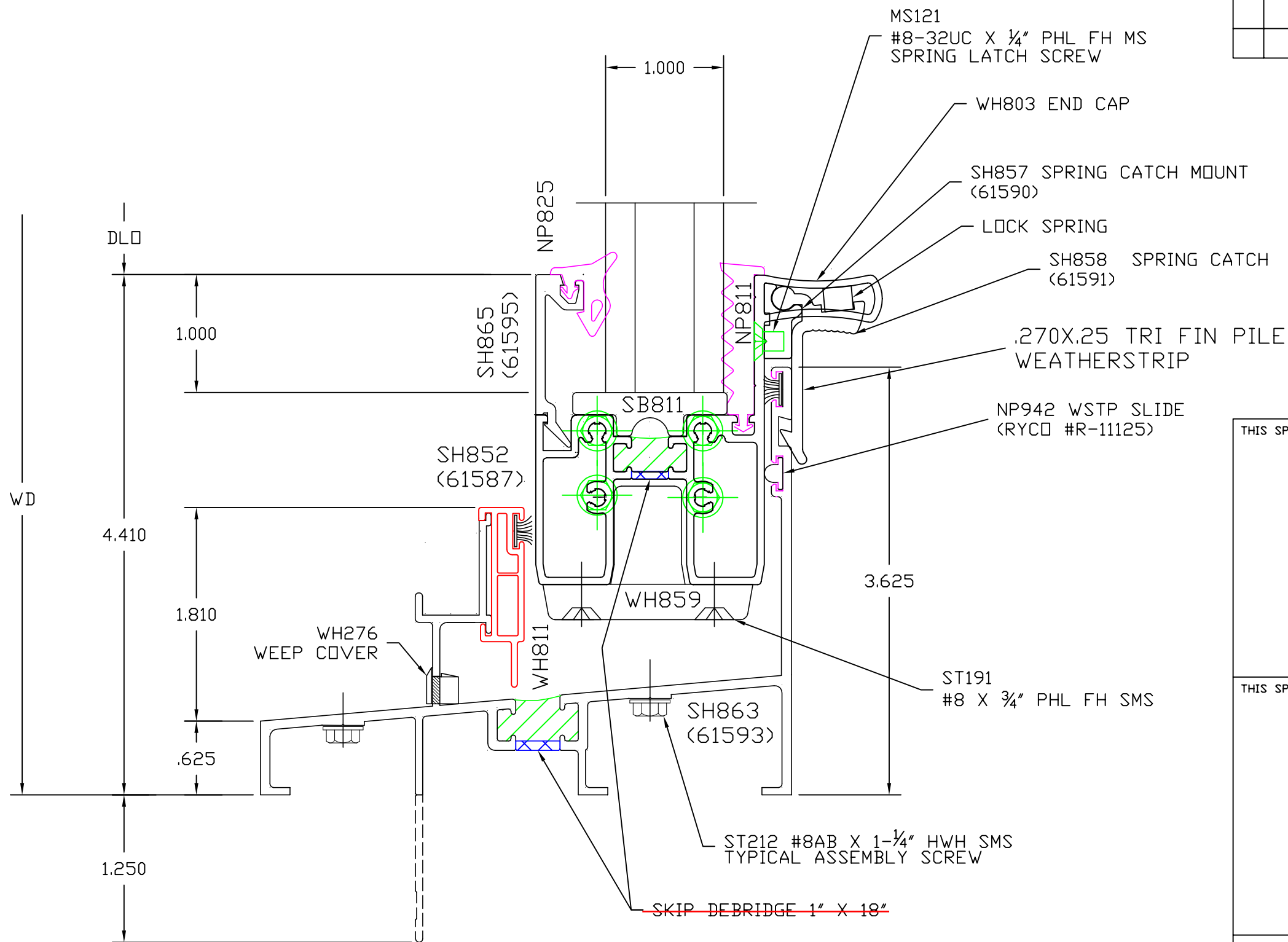
Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Frieelsburger*

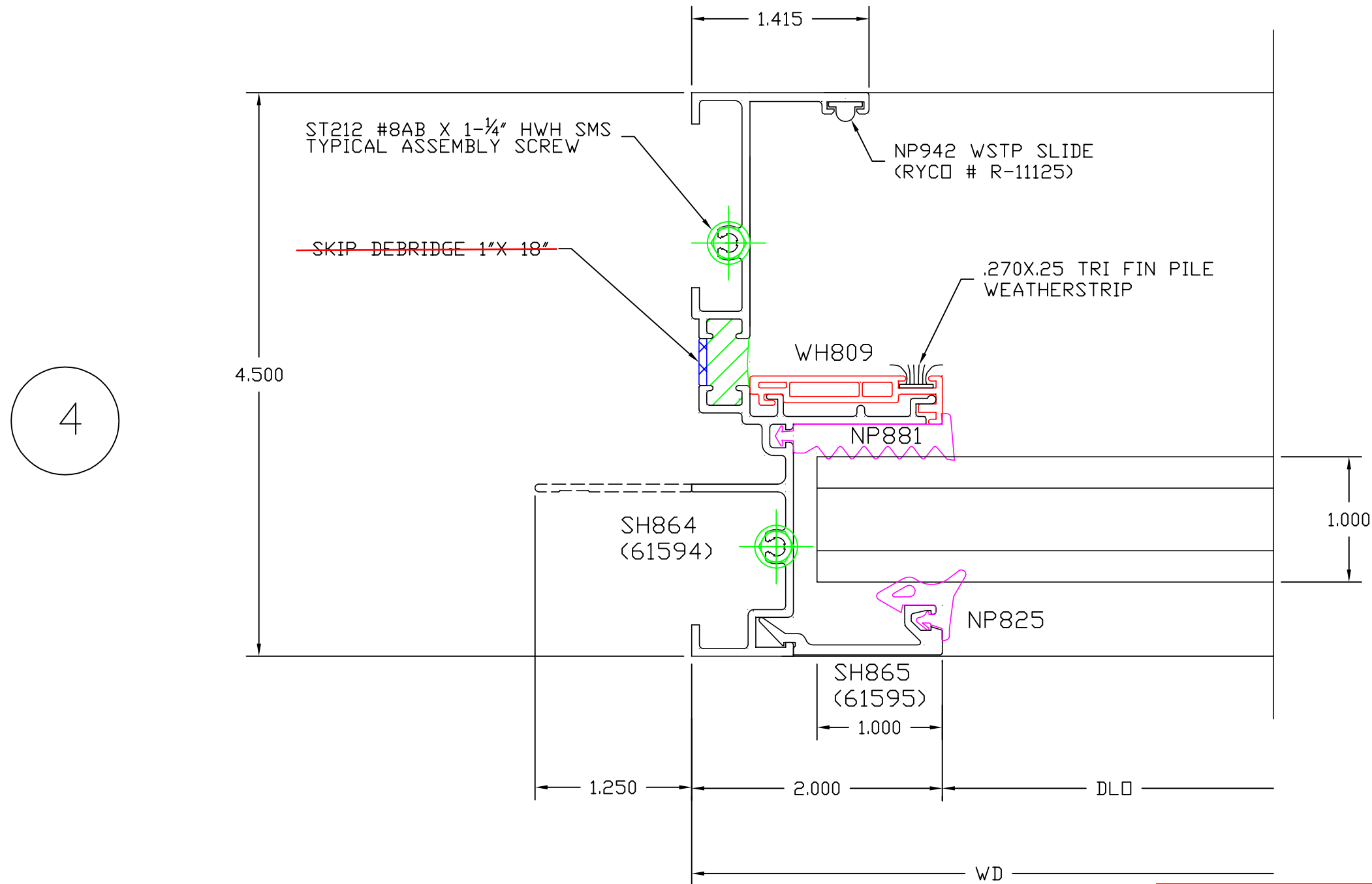
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3



SYM	REVISION	DATE	BY

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THIS SPACE RESERVED FOR METRO-DADE USE ONLY		
United States Aluminum 720 Cel-River Road Rock Hill, SC 29730 200 Singleton Drive Waxahachie, TX 75165		
DRAWN BY DCW	SYSTEM SERIES 8000 SINGLE HUNG WINDOW	
DATE 02.22.10	DESCRIPTION DETAILS	
APPVD BY		
SCALE FULL	DRAWING NO. 80SH-035	SHEET 5 OF 6



ATI

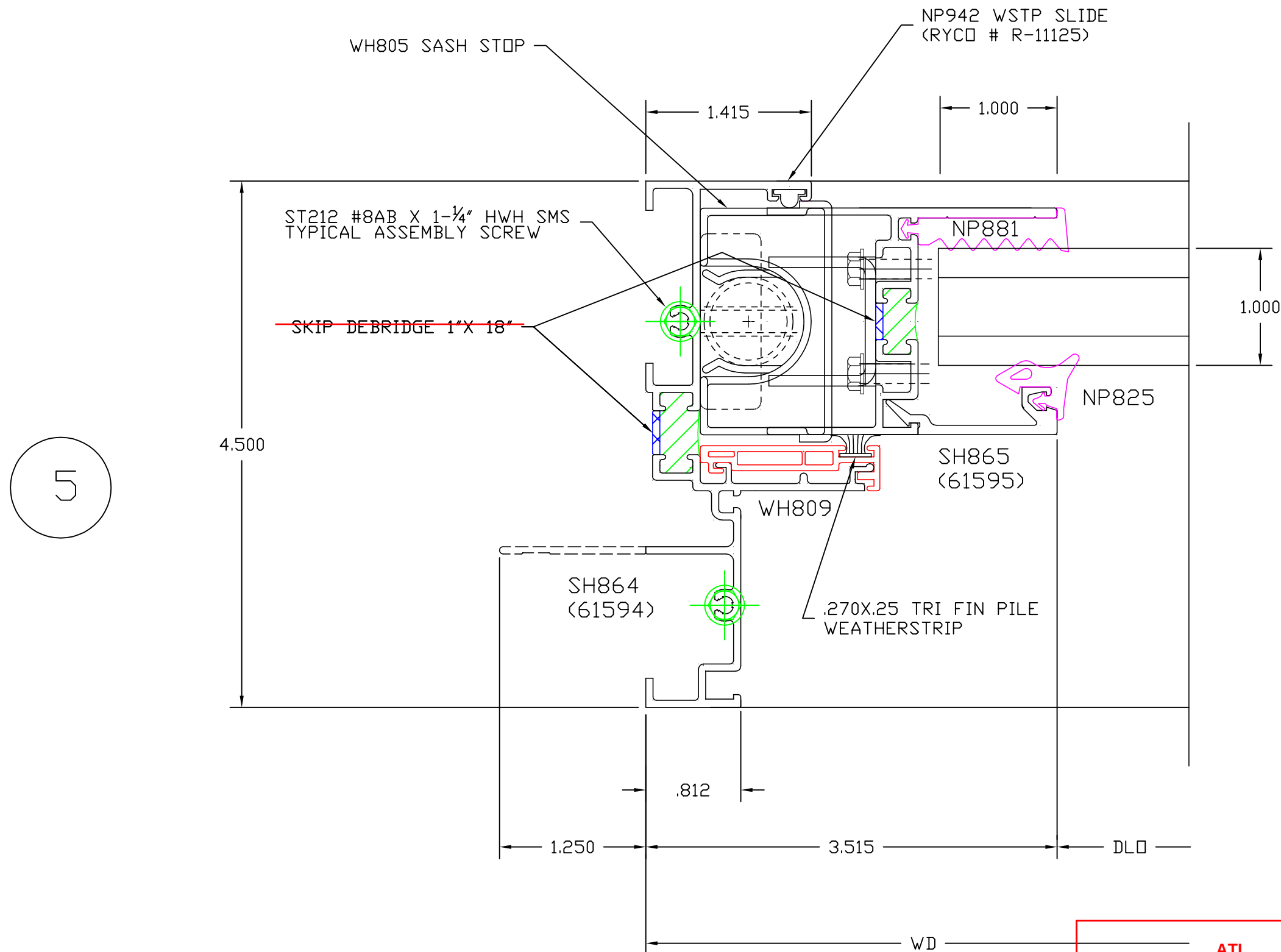
Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Grubbs*

SYM	REVISION	DATE	BY

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THIS SPACE RESERVED FOR METRO-DADE USE ONLY		
United States Aluminum 720 Cel-River Road Rock Hill, SC 29730 200 Singleton Drive Waxahachie, TX 75165		
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DATE 02.22.10	DESCRIPTION DETAILS	
APPVD BY		
SCALE FULL	DRAWING NO. 80SH-035	SHEET 6 OF 6



Report #

99402-116-45

Date

05-13-2010

Simulator

Kristen L. Luelsburger

ATI

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator Kristen L. Livelsberger

U.S. ALUMINUM CORP.

H-61587 |

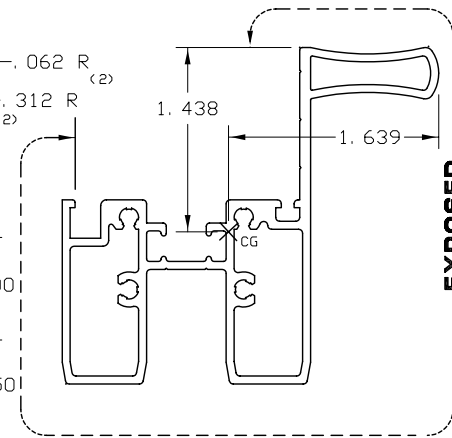
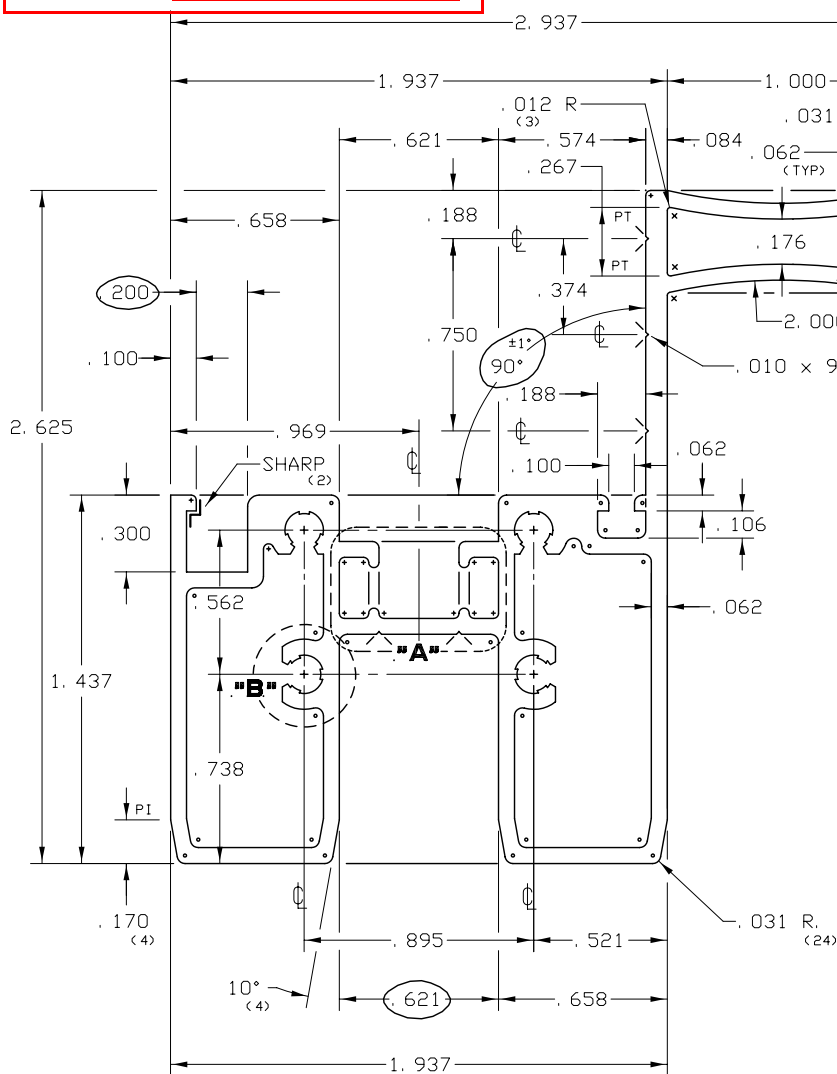
8000 SERIES
BOTTOM RAIL

TER MEER

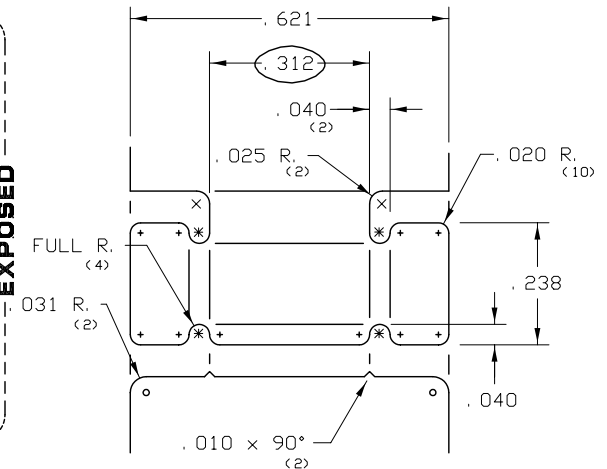
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SH852

2 X SIZE



ACTUAL SIZE

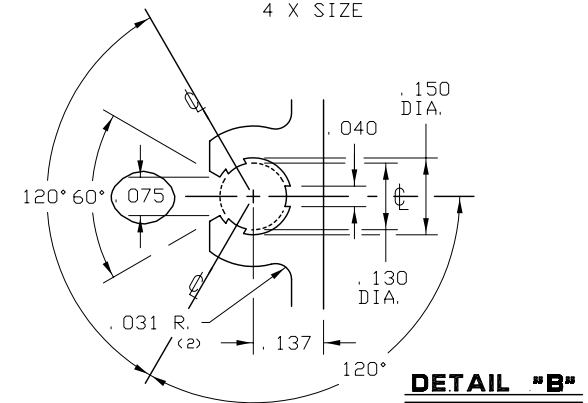


DETAIL "A"

4 X SIZE

NOTES:

1. 6063-T5 ALLOY AND TEMPER.
2. MATES WITH SH865; DIE 61589
3. DEBRIDGE WITH A .312 x
.015 MAX PENETRATION INTO
THERMAL AREA.
4. THERMAL DETAIL AREA: .209;
(MODIFIED "DD")
5. PAINT PERIMETER: 9.708"
6. OUTSIDE PERIMETER: 15.470



DETAIL "B"

4 X SIZE
(SIM 4 PLACES)

			.062	
	.912	C-1789	1	
	1.094	4.000	PORHOLE 10X5.5	
	26.647	HOLLOW III	61588	
	24	8" 59/PRESS 4	H-61587	

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator Kristin L. Lindelberger

U.S. ALUMINUM CORP.

H-61588

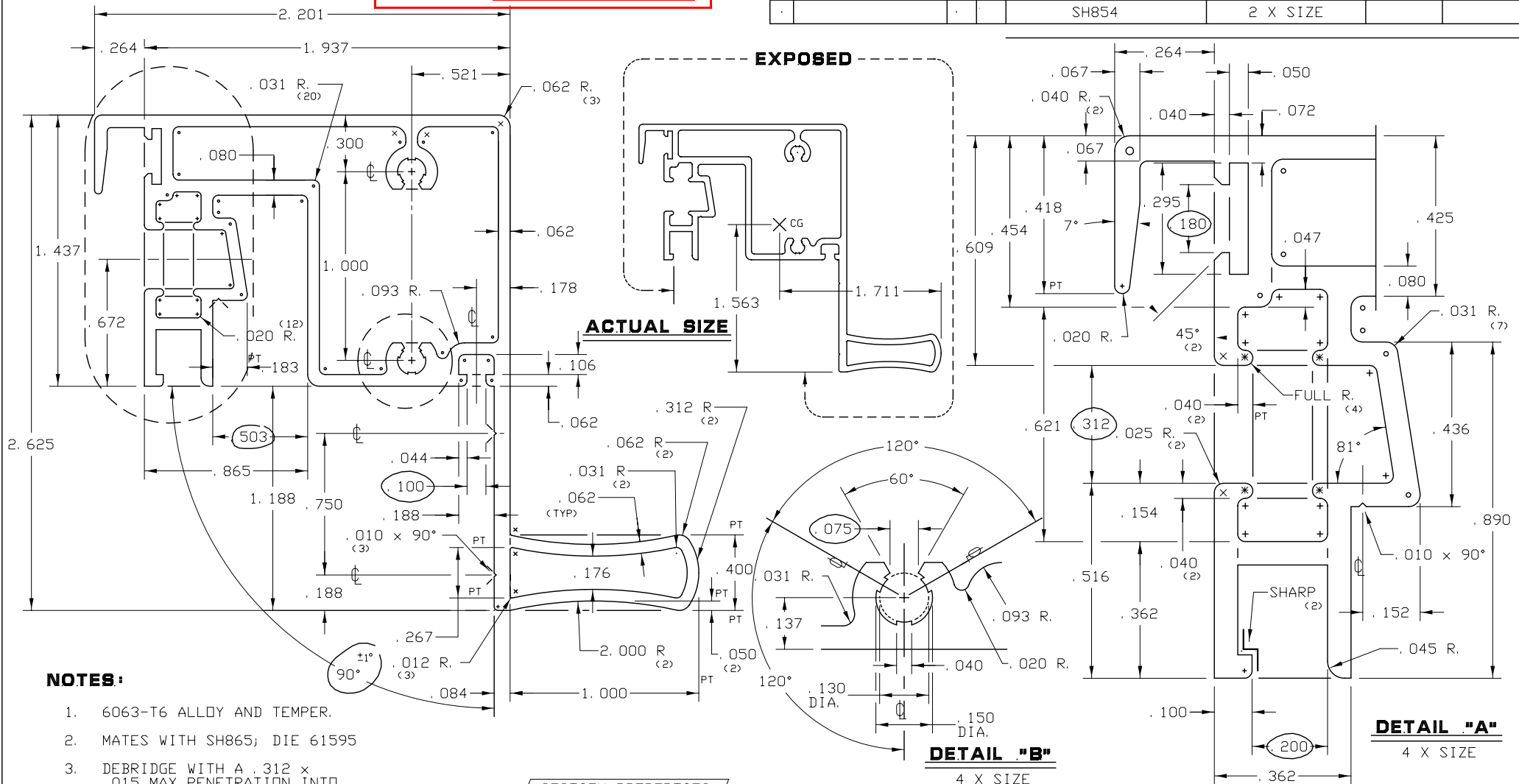
8000 SERIES
INTERLOCKER

TER MEER

02/15/10

SH854

2 X SIZE



			.062
	.932	C-1788	1
	1.118	3.840	PORTHOLE 10X5.5
	27.715	HOLLOW III	12X7.5 61588
	25	8" 57/PRESS 4	H-61588

U.S. ALUMINUM CORP.

T-61589

8000 SERIES STILE

TER MEER

02/15/10

SH855

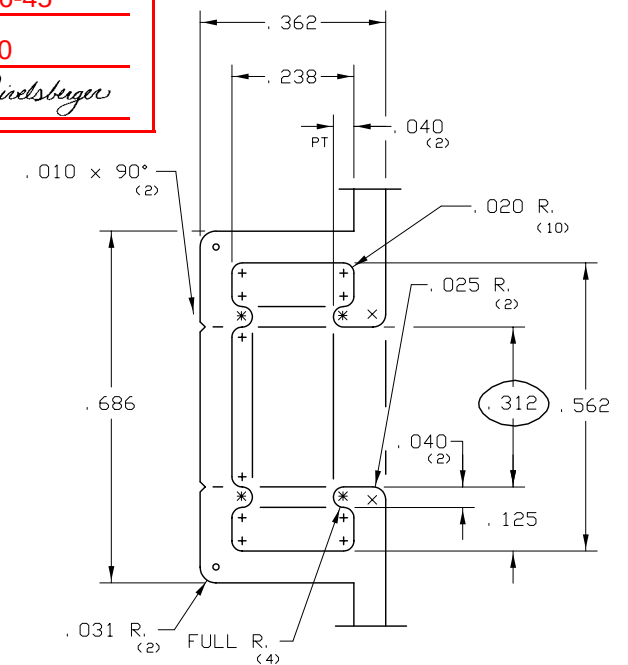
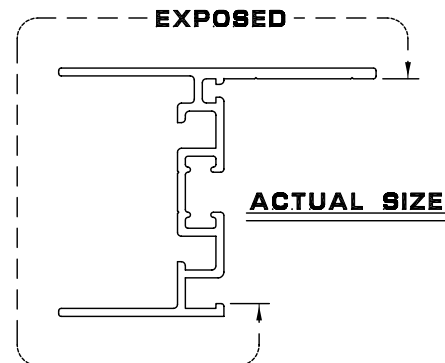
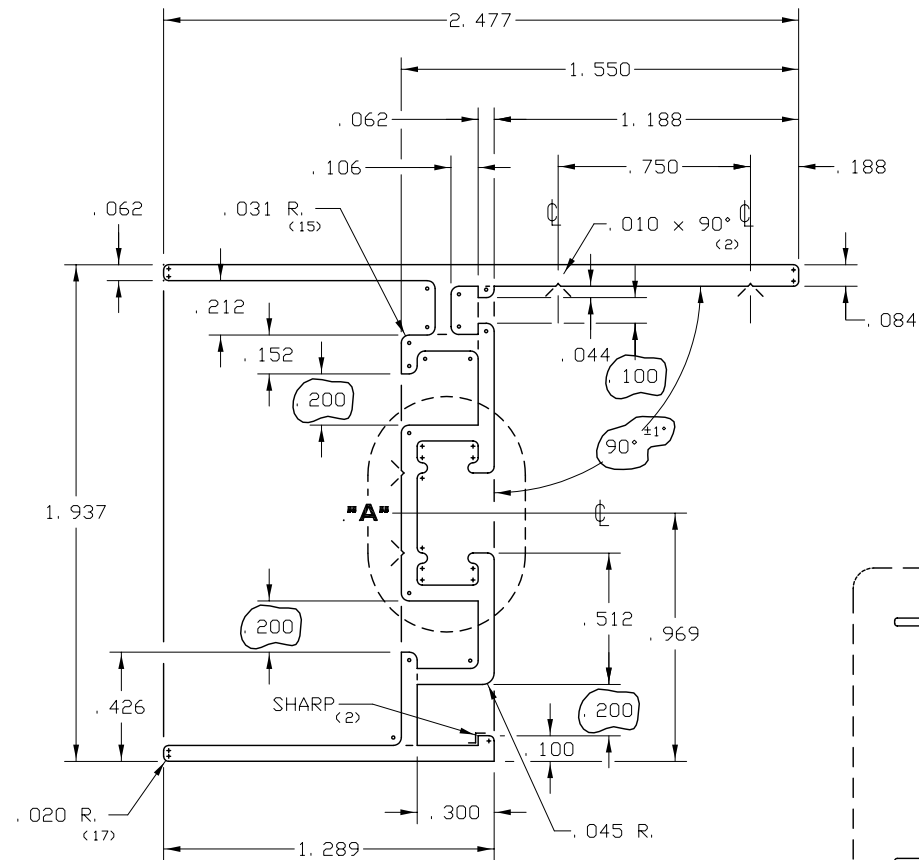
2 X SIZE

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Livelsberger*



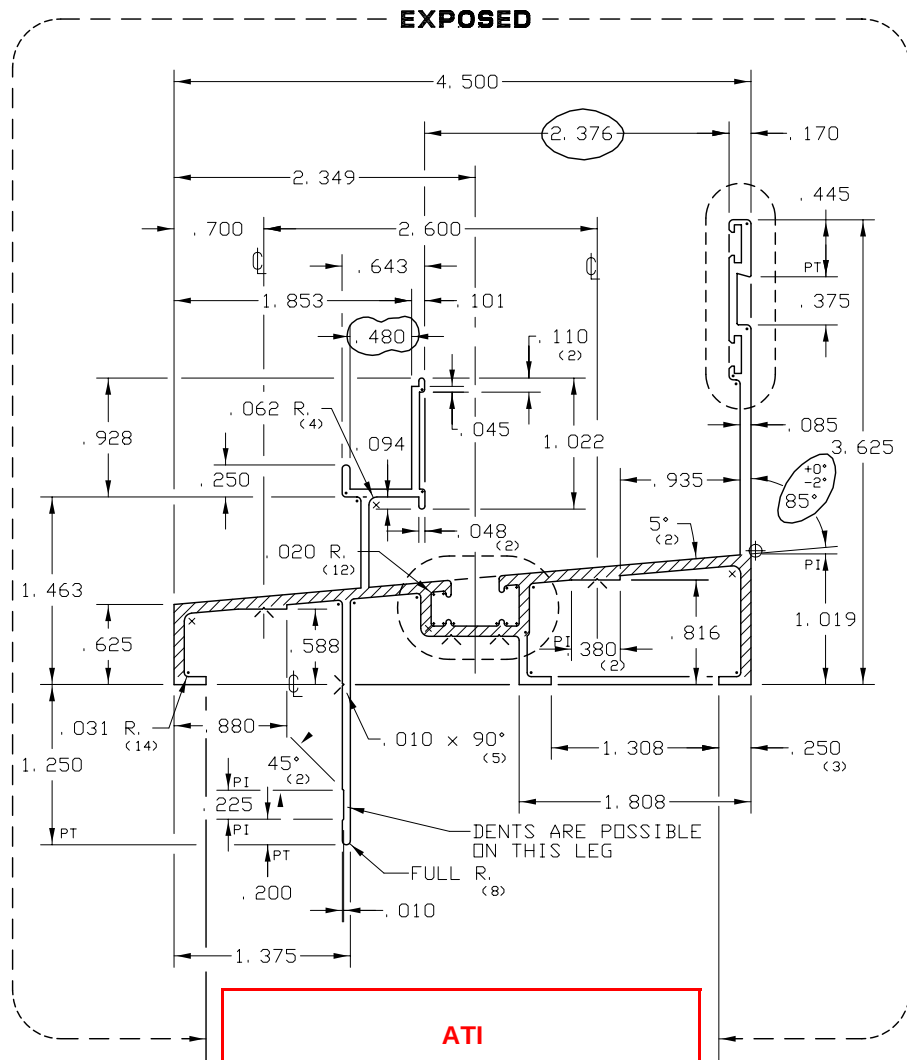
DETAIL "A"
4 X SIZE

NOTES:

- 6063-T5 ALLOY AND TEMPER.
- MATES WITH SH865; DIE 61595
- DEBRIDGE WITH A .312 x .015 MAX PENETRATION INTO THERMAL AREA.
- THERMAL DETAIL AREA: .147; (MODIFIED "DD")
- PAINT PERIMETER: 6.418"

9X2 DIE 1/2 RECESS

			.062
	.488	C-1792	1
	.586	3.128	9 X 61589
	14.641	SOLID	32121
	25	7" 83/PRESS 3	T-61589



ATI

Report # 99402-116-45

Date 05-13-2010

Simulator Kristen L. Luebsberger

U.S. ALUMINUM CORP.

T-61593

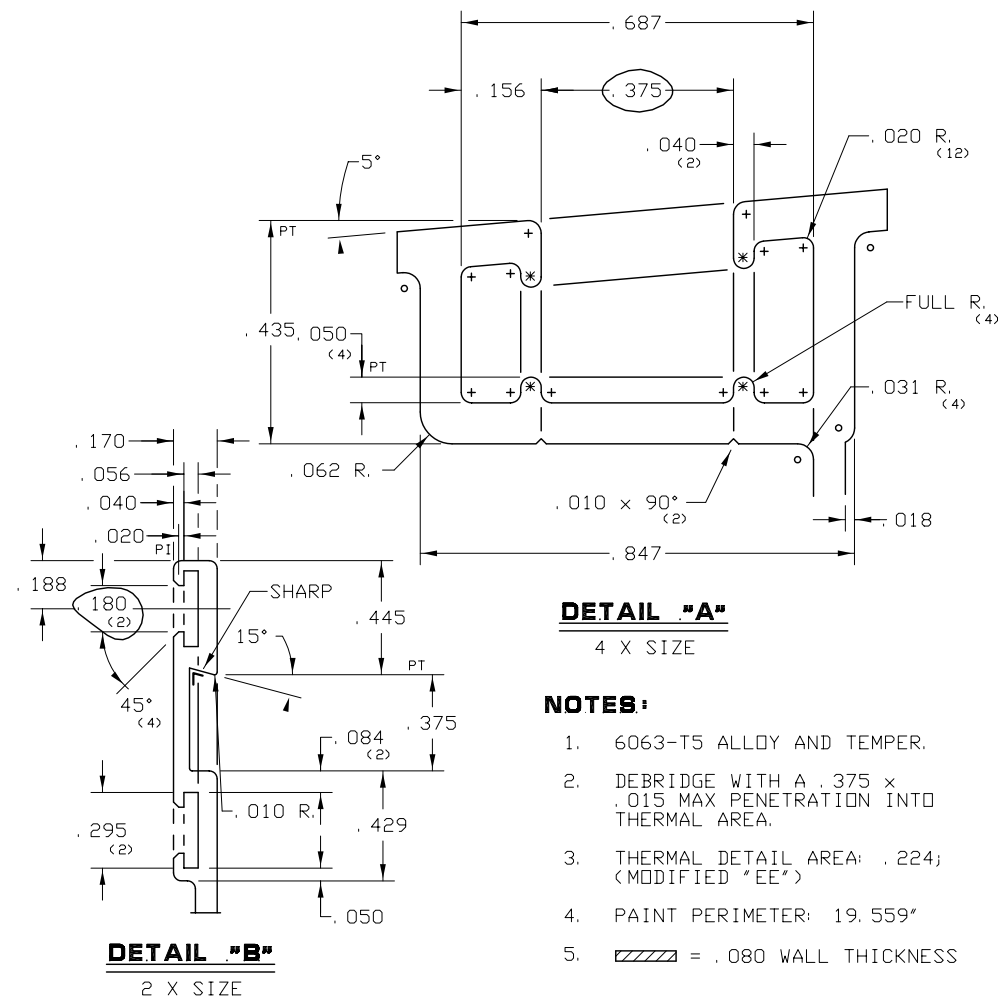
8000 SERIES SILL

TER MEER

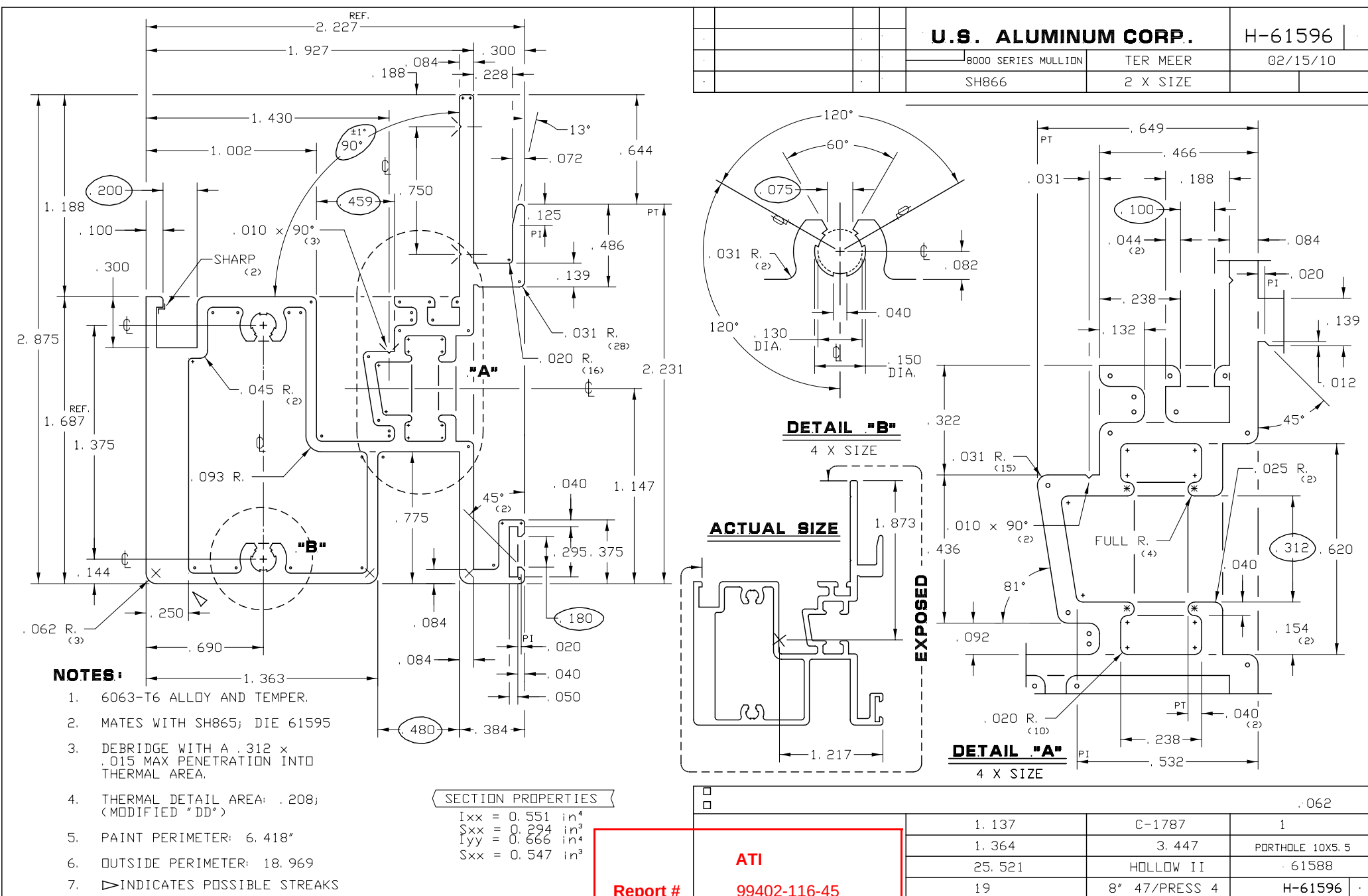
02/12/10

SH863

FULL SIZE



			.062
	1.151	C-1790	1
	1.381	5.857	12 X 61593
	31.324	SOLID	15x8.5 61593
	23	8" 46/PRESS 4	T-61593



Report #	ATI 99402-116-45
Date	05-13-2010
Simulator	Kristen L. Lovelsbey

			.062
1.137	C-1787	1	
1.364	3.447	PORTHOLE 10X5.5	
25.521	HOLLOW II	61588	
19	8" 47/PRESS 4	H-61596	

REF. DRAWING: IW1841



RADIUS SCHEDULE

```
s - SHARP
a - , 006 R.
b - , 012 R.
c - , 015 R.
d - , 020 R.
e - , 030 R.
f - , 045 R.
g - , 060 R.
```

1. MATERIAL: RIGID PVC TO MEET AAMA 303-07
2. ALL UNSPECIFIED RADII = .020
3. TYPICAL EXTERIOR WALL THICKNESS: .050
TYPICAL INTERIOR WALL THICKNESS: .025
4. AREA: .181
5. MINIMUM SHEEN ALLOWED 56.0 USING A
GARDNER MICRO-GLOSS 60° GLOSS METER.
6. TOLERANCE UNLESS OTHERWISE NOTED $\pm .012$
7. WALL THICKNESS TOLERANCE TO BE: $\pm .006$

IWC TOLERANCES FOR PVC EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE

Report # 99402-116-45

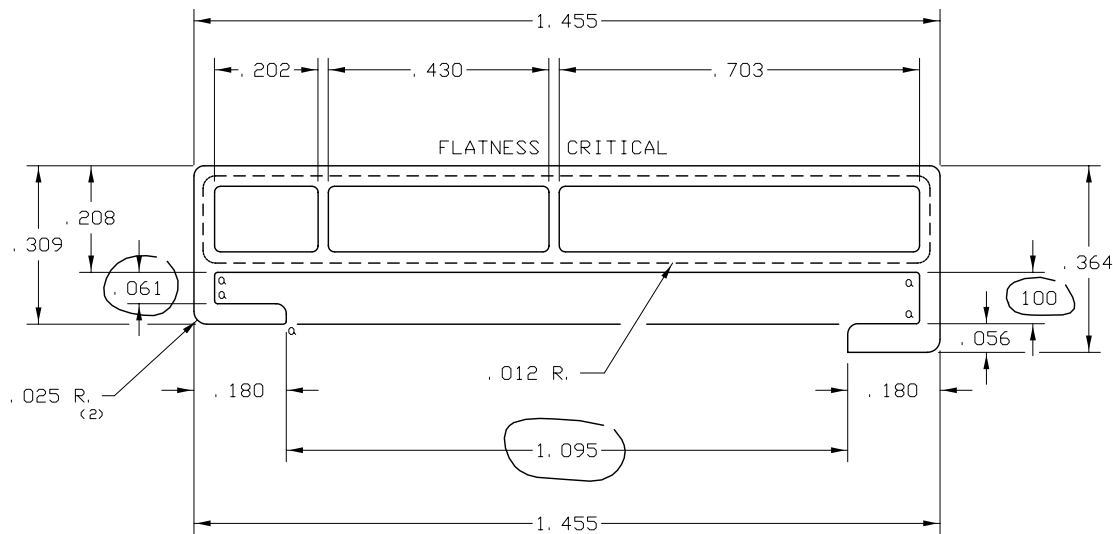
Date 05-13-2010

Simulator *Kristen L. Livelsberger*

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				INTERNATIONAL WINDOW CORP.		
				Willie C.	JAMB THERMO ISOLATOR	
③	ADDED NOTES 6 & 7	03/10/10	RT	02/05/08		
				4 X SIZE	SERIES 8900 (WH809)	8000SH-038B

RELEASE FOR PRODUCTION
DATE: MARCH 9, 2010
APPRV'D BY JOHN FREY



ACTUAL SIZE

RELEASE FOR PRODUCTION
DATE: MARCH 9, 2010
APPROV'D BY JOHN FREY

RADIUS SCHEDULE

s	-	SHARP	
a	-	.006	R.
b	-	.012	R.
c	-	.015	R.
d	-	.020	R.
e	-	.030	R.
f	-	.045	R.
g	-	.060	R.

ATI

Report # 99402-116-45

Date 05-13-2010

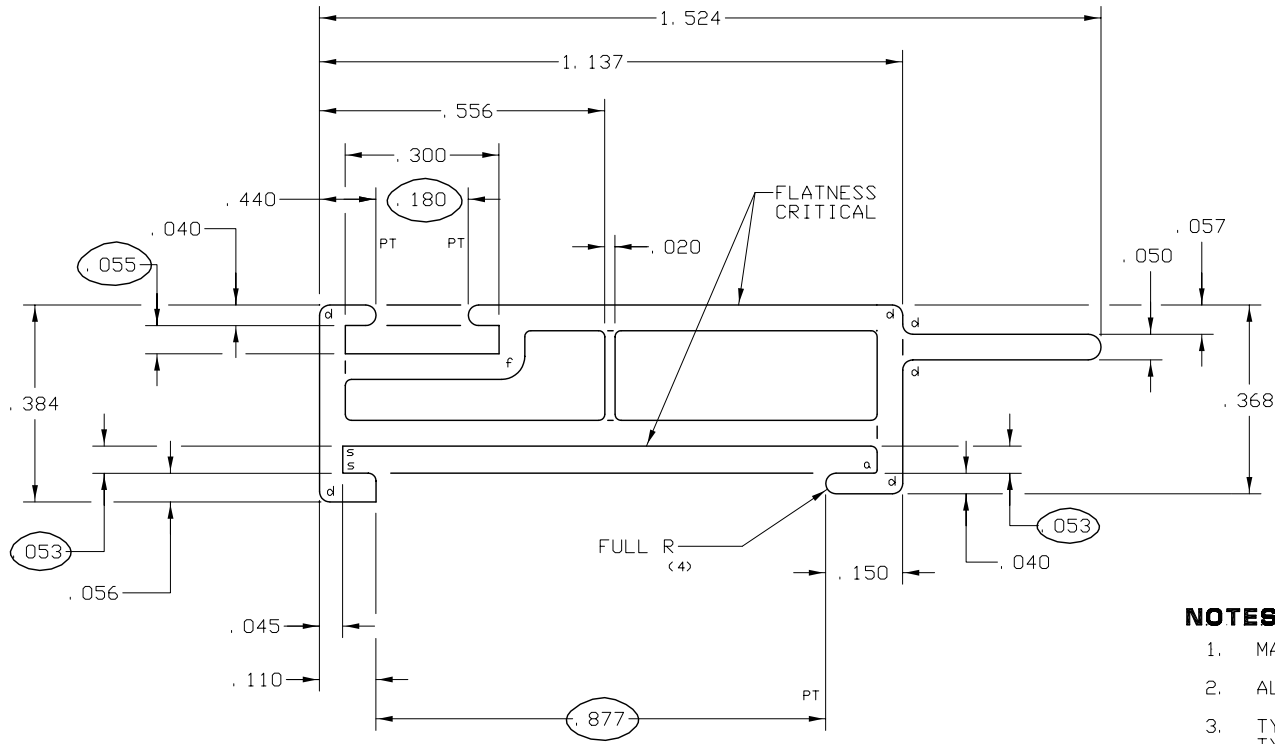
Simulator *Kristen L. Livelsberger*

NOTES:

1. MATERIAL: RIGID PVC TO MEET AAMA 303-07
2. ALL UNSPECIFIED RADII = .020
3. TYPICAL EXTERIOR WALL THICKNESS: .040
TYPICAL INTERIOR WALL THICKNESS: .020
4. AREA: .155
5. MINIMUM SHEEN ALLOWED 56.0 USING A
GARDNER MICRO-GLOSS 60° GLDSS METER.

IWC TOLERANCES FOR PVC EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE

				INTERNATIONAL WINDOW CORP.		
				TER MEER	HEAD THERMO ISOLATOR	
				03/02/10		
				4 X SIZE	SERIES 8900 (WH808)	8000SH-036



ACTUAL SIZE

RELEASE FOR PRODUCTION
DATE: MARCH 9, 2010
APPR'D BY JOHN FREY

NOTES:

1. MATERIAL: RIGID PVC TO MEET AAMA 303-07
2. ALL UNSPECIFIED RADII = .012
3. TYPICAL EXTERIOR WALL THICKNESS: .050
TYPICAL INTERIOR WALL THICKNESS: .020
4. AREA: RIGID PVC- .180
5. MINIMUM SHEEN ALLOWED 56.0 USING A GARDNER MICRO-GLOSS 60° GLOSS METER.
6. TOLERANCE UNLESS OTHERWISE NOTED $\pm .012$.
7. WALL THICKNESS TOLERANCE TO BE: $\pm .006$

IWC TOLERANCES FOR PVC EXTRUDED SHAPES APPLY UNLESS SPECIFICALLY SHOWN OTHERWISE

RADIUS SCHEDULE

- S - SHARP
a - .006 R.
b - .012 R.
c - .015 R.
d - .020 R.
e - .030 R.
f - .045 R.
g - .060 R.

ATI

Report # 99402-116-45

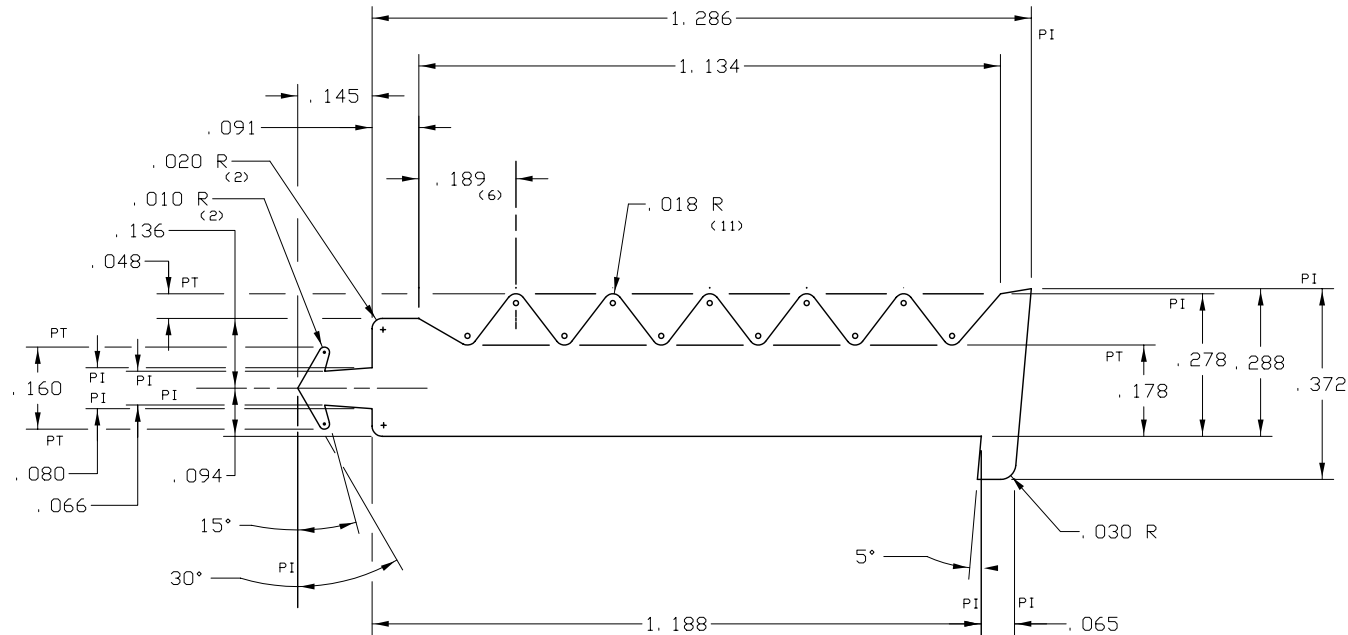
Date 05-13-2010

Simulator Kristen L. Lindelberger

				UNITED STATES ALUMINUM CORP.		
				TER MEER	SILL THERMO ISOLATOR	
Ⓑ	ADDED NOTE #7	03/10/10	RT	03/02/10		
				4 X SIZE		SERIES 8000 (WH811)



ACTUAL SIZE



NOTES:

1. AREA: .308 IN²
2. MATERIAL: EPDM SPONGE
3. PART NO. NP881

ATI

Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Lindenberg*

UNITED STATES ALUMINUM CORP.

Willie C.

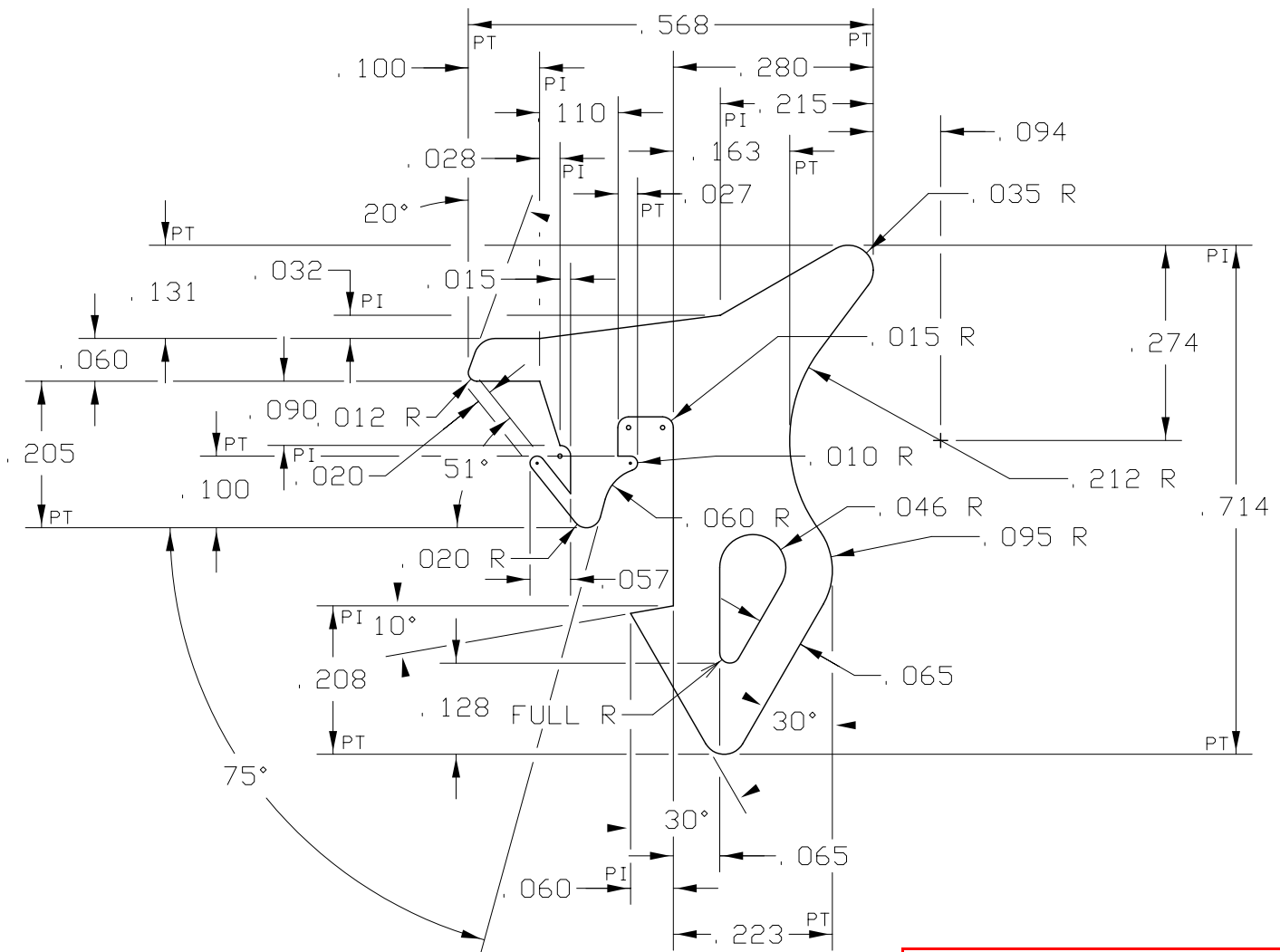
02/05/10

4 X SIZE

INTERIOR GLAZING
GASKET (8000 SH WINDOW)

PART# NP881

8000SH-011

**ACTUAL SIZE****NOTES:**

1. AREA = .151 in²
2. MATERIAL: EPDM DENSE
3. DUROMETER: 70 ±5 SHORE
4. PART NO. NP825

ATI**Report #** 99402-116-45**Date** 05-13-2010**Simulator** Kristen R. Grubbsberger**U.S. ALUMINUM CORP.**

PRESTON

05/16/06

4 X SIZE

EXTERIOR GLAZING GASKET
FOR IG500/IG600 SYSTEM

PART# : NP825

USA-2957

Standard Air Spacer

*LASER WELDED

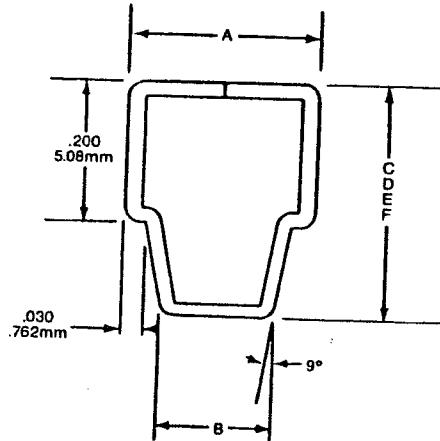
TOLERANCES:

A, $\pm .005$.127mm

B, $\pm .005$.127mm

C, D, E, F $\pm .005$.127mm

DECIMAL
IN INCHES



*3/16 & 5mm Not Welded at this Time

"C" — .0135" Clear Anodized Aluminum Height — .309 7.85mm

"D" — .0165" Clear Anodized Aluminum Height — .315 8mm

"E" — .0170" Mill Finish Aluminum Height — .316 8.03mm

"F" — .0150" Electro-Galvanized & Black Steel Height — .318 8.07mm

Available with serrations at no extra charge on inside of Aluminum spacer at "A" dimension; not recommended for spacers to be bent.

FRACTIONAL DECIMAL IN INCHES

Size	A	B
3/16	.188	.088
7/32	.219	.119
1/4	.250	.150
17/64	.266	.166
9/32	.281	.181
19/64	.297	.197
5/16	.313	.213
11/32	.344	.244
23/64	.359	.259
3/8	.375	.275
13/32	.406	.306
7/16	.438	.338
15/32	.469	.369
1/2	.500	.400
17/32	.531	.431
9/16	.563	.463
19/32	.594	.494
5/8	.625	.525
21/32	.656	.556
11/16	.688	.588
23/32	.719	.619
3/4	.750	.650
13/16	.813	.713
7/8	.875	.775

MILLIMETERS DECIMAL IN INCHES

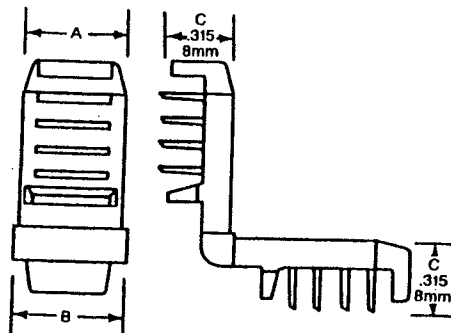
Size	A	B
5	.197	.097
6	.236	.136
7	.276	.176
7.5	.296	.196
8	.315	.215
9	.354	.254
10	.394	.294
11	.433	.333
11.5	.453	.353
12	.472	.372
13	.512	.412
13.2	.520	.420
14	.551	.451
15	.591	.491
15.5	.610	.510
16	.630	.530
17	.669	.569
18	.709	.609
18.5	.728	.628
19	.748	.648
20	.787	.687
22	.866	.766

Standard Fixed Nylock Corner Key with Fin

COMPOUND:

#6 Nylon

Also available upon request, at no additional cost, glass reinforced nylon for added strength.



DECIMAL IN INCHES

TOLERANCES:

A, $\pm .005$.127mm

B, $\pm .005$.127mm

C, $\pm .005$.127mm

FRACTIONAL DECIMAL IN INCHES

Size	A	B
3/16-.188	.148	.178
7/32-.219	.178	.208
1/4-.250	.210	.240
17/64-.266	.226	.256
9/32-.281	.241	.271
19/64-.297	.257	.287
5/16-.313	.273	.303
11/32-.344	.304	.334
23/64-.359	.314	.344
3/8-.375	.335	.365
13/32-.406	.366	.396
7/16-.438	.397	.427
15/32-.469	.438	.468
1/2-.500	.456	.490
17/32-.531	.487	.521
9/16-.563	.518	.552
19/32-.594	.550	.584
5/8-.625	.581	.615
21/32-.656	.612	.646
11/16-.688	.644	.678
23/32-.719	.674	.708
3/4-.750	.706	.740
13/16-.813	.769	.803
7/8-.875	.831	.865

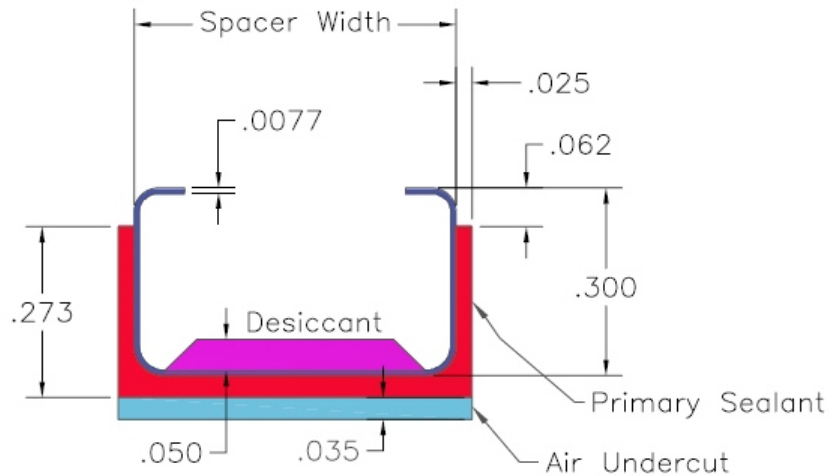
MILLIMETERS DECIMAL IN INCHES

Size	A	B
5 -.197	.148	.178
6 -.236	.196	.226
7 -.276	.241	.271
7.5-.297	.257	.287
8 -.315	.273	.303
9 -.354	.314	.344
10 -.394	.354	.384
11 -.433	.397	.427
11.5-.453	.413	.443
12 -.472	.438	.468
13 -.512	.468	.502
14 -.551	.507	.541
15 -.591	.550	.584
15.5-.610	.566	.600
16 -.630	.581	.615
17 -.669	.625	.659
18 -.709	.664	.698
19 -.748	.706	.740
20 -.787	.737	.771
22 -.866	.831	.865

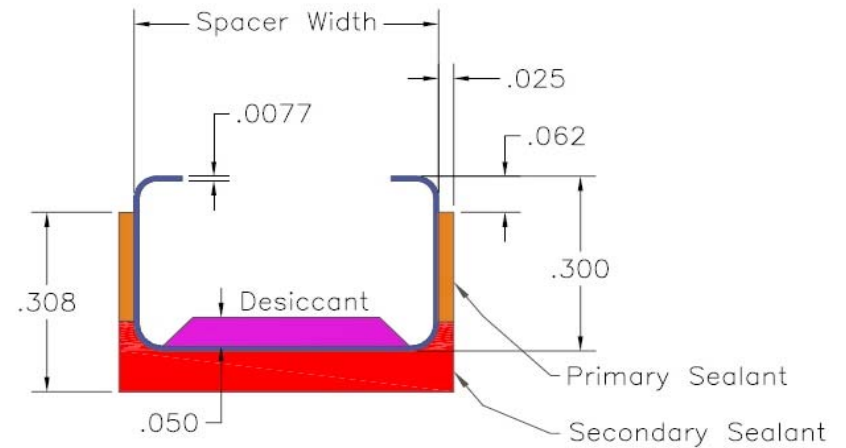


Intercept® Technologies —Correct Geometry

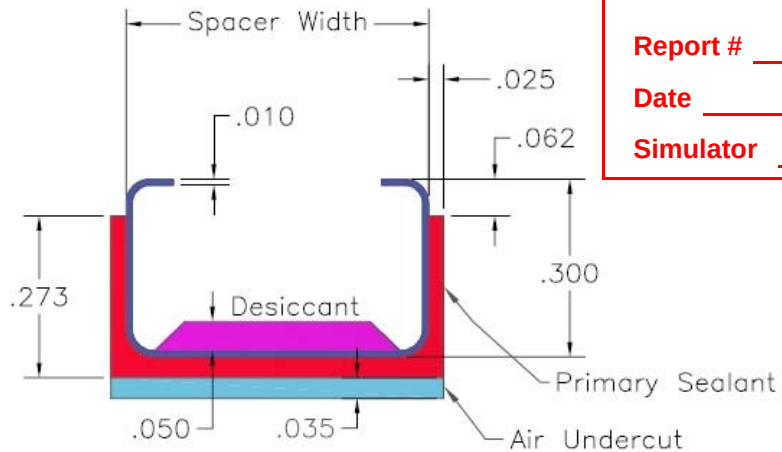
**Intercept® ULTRA Stainless Steel—Standard Profile
SINGLE SEAL**



**Intercept® ULTRA Stainless Steel—Standard Profile
DUAL SEAL**



**Intercept® Blackline or Electrolytic Tin Plated Steel—Standard Profile
SINGLE SEAL**



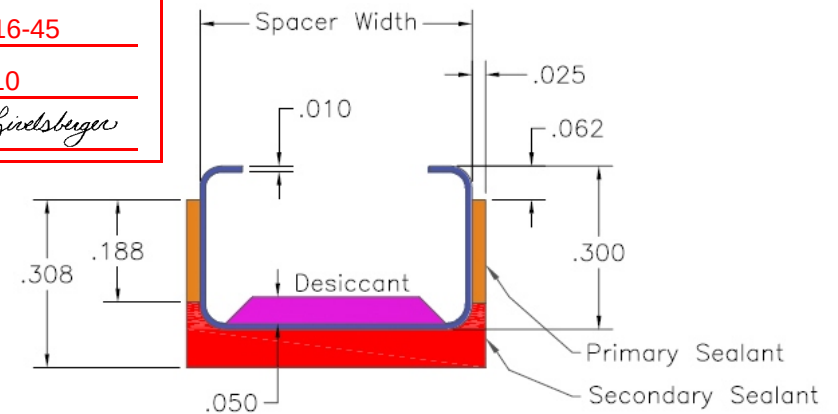
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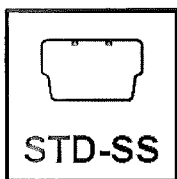
Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Luelsburger*

**Intercept® Blackline or Electrolytic Tin Plated Steel—Standard Profile
DUAL SEAL**

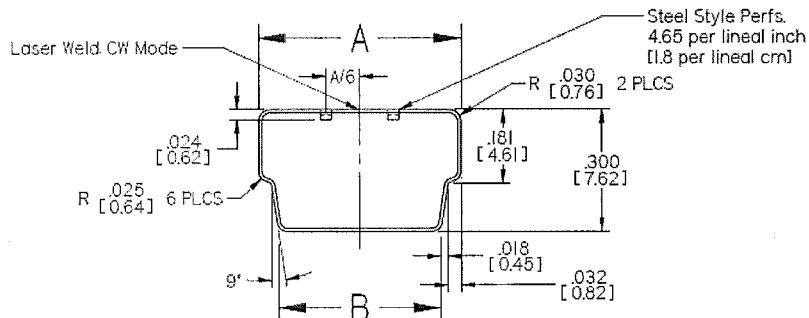




ALLMETAL®

Viracon-9-19-2007 (R1)

Standard Stainless Steel Air Spacer



Dimensions are in decimal inches; dimensions in [] brackets are in mm.

Tolerance: All dimensions are $\pm .005$ [.13] unless otherwise specified.

Material: UNS S20100 "201" Stainless Steel, .0080 [.203] $\pm .00025$ [.0064] Wall Thickness, Annealed Temper, 1 CBA Finish.

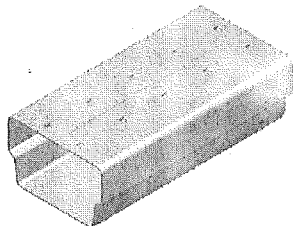
Thermal: Conductivity = 103 Btu-in/h-ft² - °F [14.855 W/m°C]

Expansion = 8.7×10^{-6} in/in/°F [15.7×10^{-6} cm/cm/°C]

Shearing type perforations, 4.65 holes/inch [1.8 holes/cm], hole dia. at minimum opening approximately .002 [.051].

Continuous laser weld, no exterior flash, no through burns; Spacer must be clean and free of dirt, oil, dings.

Air Spacer Width Fractional	Decimal Equivalent	
	A	B
3/16	.188	.088
7/32	.219	.119
1/4	.250	.150
17/64	.266	.166
9/32	.281	.181
19/64	.297	.197
5/16	.313	.213
11/32	.344	.244
23/64	.359	.259
3/8	.375	.275
13/32	.406	.306
7/16	.438	.338
15/32	.469	.369
1/2	.500	.400
17/32	.531	.431
9/16	.563	.463
19/32	.594	.494
5/8	.625	.525
21/32	.656	.556
11/16	.688	.588
23/32	.719	.619
3/4	.750	.650
25/32	.781	.681
13/16	.816	.716
27/32	.844	.744
7/8	.875	.775
1	1.000	.900



TOLERANCES EXCEPT AS NOTED	
DECIMAL INCHES	
.XX .XXX .XXXX	
$\pm .01$.005 .002	
DECIMAL MM	
X .XX	
$\pm .25$ mm .13mm	
ANGULAR	
$\pm 1^\circ$	

Air Spacer Width Millimeter	Decimal Equivalent	
	A	B
5.5	.217	.117
6.0	.236	.136
7.0	.276	.176
7.5	.295	.195
8.0	.315	.215
9.0	.354	.254
10.0	.394	.294
11.0	.433	.333
11.5	.453	.353
12.0	.472	.372
13.0	.512	.412
13.2	.520	.420
14.0	.551	.451
15.0	.591	.491
15.5	.610	.510
16.0	.630	.530
17.0	.669	.569
17.5	.689	.589
18.0	.709	.609
18.5	.728	.628
19.0	.748	.648
20.0	.787	.687
22.0	.866	.766

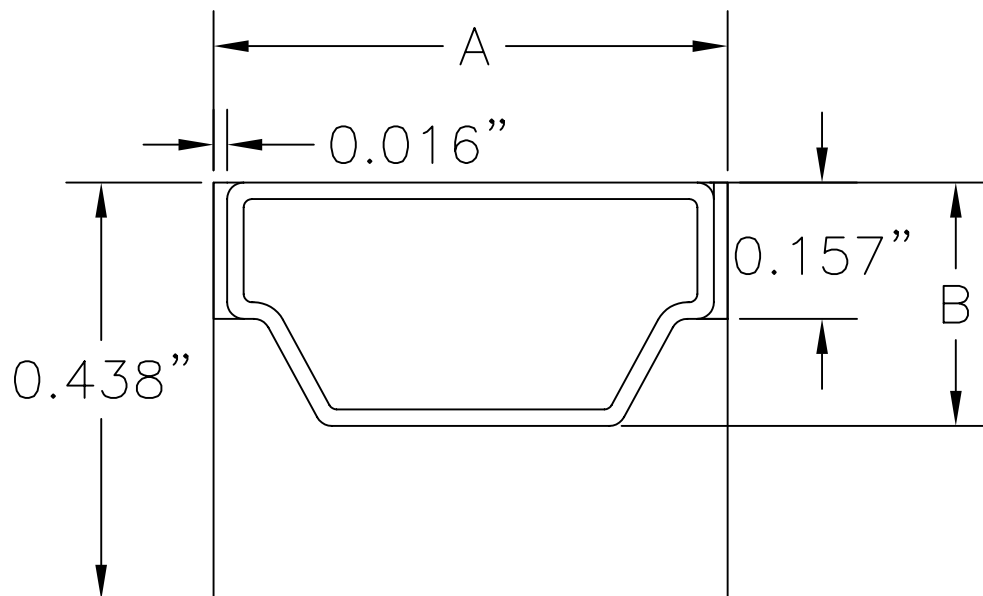
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Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen L. Luelsburger*

Steel Spacer



Material: Steel, Rolled Ground
Width (A): 0.297
Height (B): 0.295
Wall Thickness: 0.016

ATI
Report # 99402-116-45
Date 05-13-2010
Simulator Kristen L. Lueckelberger

Super Spacer®

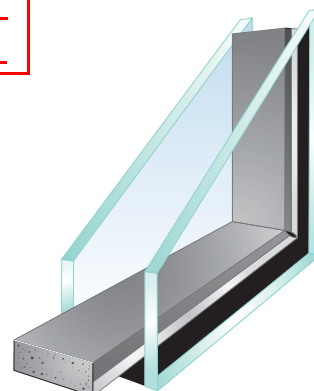
ATI

Report # 99402-116-45

Date 05-13-2010

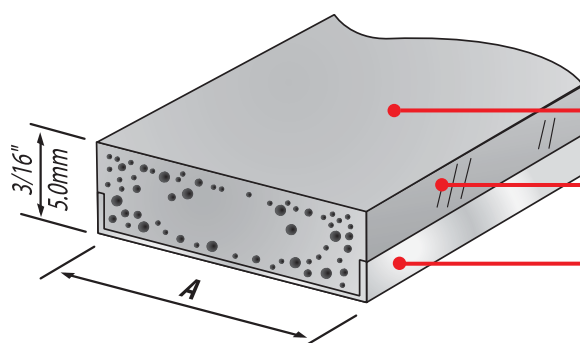
Simulator *Kristen A. Livelsberger*

Super Spacer Standard is a flexible, organic foam spacer product that provides excellent perimeter insulation for sealed glazing units. Desiccant-filled with pre-applied side adhesive, the structural foam spacer significantly simplifies insulating glass production. Featuring a vapour barrier backing, the product must be used in combination with conventional IG sealants such as hot melt butyl, polyurethane or solvent-free polysulfide. Dual seal equivalent sealants may also be used (reference IG sealants Technical Bulletin RD0018).



Characteristics	Norm	Specification / Typical Value
Composition:	—	Foam EPDM (Ethylene Propylene Diene Monomer) base with desiccant pre-fill
Performance Characteristics: Thermal conductivity Colours Gas / Moisture vapour barrier Primary structural seal	ASTM C518 — ASTM F1249 ASTM D3985	0.162 W/mK Light Grey, Medium Grey, Black WVTR < 0.020 gm/m ² /day Oxygen < 0.009 cc/m ² /day Acrylic adhesive
Physical Characteristics: Density Specific Gravity Hardness	ASTM D1056 ASTM D1056 ASTM D2240	50 - 65 pcf 0.800 - 1.041 g/cm ³ 88 shore 00
Dimensions:	—	Reference attached table
Desiccant fill	—	40% by weight
Intermittent temperature range	—	-40°C to 121°C / -40°F to 250°F
Compatible secondary sealants	—	HMB, PU, PS, DSE (Curable HMB) Reference IG sealants Technical Bulletin RD0018
Fogging	EN 1279 - 6 ASTM 774 HIGS 2190 CGSB 12.8	No fog in visual area No fog in visual area No fog in visual area No fog in visual area
Gas Retention	EN 1279 - 3	Pass
I.G. Durability	EN 1279 - 2 ASTM 773 CGSB 12.8	Pass Pass Pass

Super Spacer®



- Flexible organic foam
- Pressure-sensitive acrylic adhesive
- Multi-layer vapour barrier

ATI
Report # 99402-116-45

Date 05-13-2010

Simulator *Kristen J. Luedsberger*

(A) Width mm	(A) Width inches	Meter/ Reel 3.281	Feet/ Reel	Meter/ Auto Reel	Feet/ Auto Reel
4.8	3/16	610	2000	N/A	N/A
6.4	1/4	457	1500	1372	4500
7.9	5/16	335	1100	1006	3300
9.5	3/8	305	1000	914	3000
11.1	7/16	274	900	823	2700
11.9	15/32	244	800	731	2400
12.7	1/2	244	800	731	2400
14.3	9/16	213	700	640	2100
15.9	5/8	206	675	617	2025
17.5	11/16	183	600	549	1800
19.1	3/4	175	575	526	1725
20	0.798	152	500	457	1500

Spacer Sizes

Super Spacer Standard is available in a standard 5mm (3/16") thickness and a full range of spacer widths from 4.8mm (3/16") to 20mm (.798").

Continuous Packaged Length

For regular insulating-glass production, Super Spacer Standard is supplied on reels with the continuous packaged length varying depending on the spacer width.

Protective Packaging

To provide desiccant protection, the reels are sealed in moisture-proof foil bags and then packaged in high-density polyethylene bags. These double-packaged reels are then shipped in recyclable cardboard boxes.

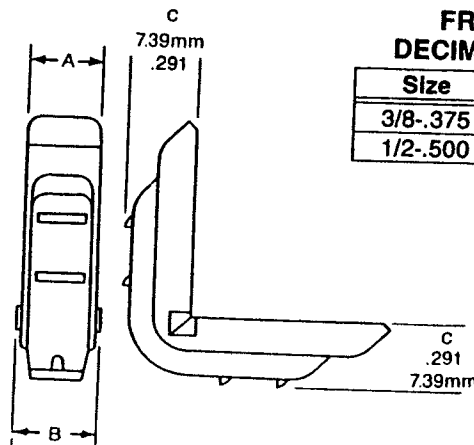
Desiccant Systems

Over 40% by spacer weight is desiccant material, and the low-deflection blend primarily consists of 3A molecular-sieve material.

Stamped Aluminum Corner Key

.025 .635mm

Aluminum Mill Finish



FRACTIONAL DECIMAL IN INCHES

Size	A	B
3/8-.375	.327	.357
1/2-.500	.452	.482

MILLIMETERS DECIMAL IN INCHES

Size	A	B
6 -.236	.188	.218
7.5-.296	.247	.277
9 -.354	.306	.336
11 -.433	.385	.415
12 -.472	.424	.454
13.2-.520	.472	.502
14 -.551	.503	.533
15.5-.610	.562	.592
17 -.669	.621	.651
18.5-.728	.680	.710

TOLERANCES:

A, $\pm .005$.127mm

B, $\pm .005$.127mm

C, $\pm .005$.127mm

DECIMAL IN INCHES

* .032 .813mm Aluminum Mill Finish

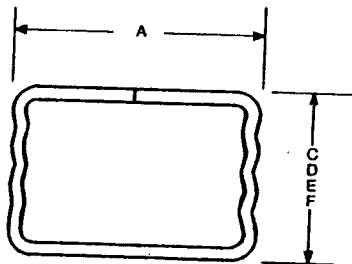
Rectangular Air Spacer

LASER WELDED

TOLERANCES:

A, $\pm .005$.127mm

C, D, E, F $\pm .005$.127mm



DECIMAL
IN INCHES

FRACTIONAL DECIMAL IN INCHES

Size	A
3/16	.188
7/32	.219
1/4	.250
17/64	.266
9/32	.281
19/64	.297
5/16	.313
11/32	.344
23/64	.359
3/8	.375
13/32	.406
7/16	.438
15/32	.469
1/2	.500
17/32	.531
9/16	.563
19/32	.594
5/8	.625
21/32	.656
11/16	.688
23/32	.719
3/4	.750
25/32	.781
27/32	.844

MILLIMETERS DECIMAL IN INCHES

Size	A
5	.197
6	.236
7	.276
7.5	.296
8	.315
9	.354
10	.394
11	.433
12	.472
13	.512
14	.551
15	.591
15.5	.610
16	.630
17	.669
18	.709
19	.748
20	.787

"C" — .0135" Clear Anodized Aluminum Height—.309 7.85mm
 "D" — .0165" Clear Anodized Aluminum Height—.315 8mm
 "E" — .0170" Mill Finish Aluminum Height—.316 8.03mm
 "F" — .0150" Electro-Galvanized & Black Steel Height—.318 8.07mm
 Available with serrations at no extra charge on inside of Aluminum spacer at "A" dimension, not recommended for spacers to be bent.

