

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

*(Revised)*

**Rendered to:  
COEUR D'ALENE WINDOW**

**SERIES/MODEL:  
4600 Double Hung**

<i>Baseline Product for Validation Testing</i>	
<b>Simulated Thermal Transmittance (U-Factor)</b>	<b>0.26</b>
Unit Size:	47.24 inches wide by 59.05 inches high
Glazing Layer 1:	DS Cardinal E366 (e=0.022,#2)
Gap 1:	0.25 inch XL Edge Spacer (SS-D) - 90% Argon Fill
Glazing Layer 2:	DS Clear
Gap 2:	0.25 inch XL Edge Spacer (SS-D) - 90% Argon Fill
Glazing Layer 3:	DS Cardinal E366 (e=0.022,#5)
Notes:	VY/VI reinforcement in the physical test

**Report Number: 98489.04-901-45**  
**Original Report Date: 04/09/10**  
**Expiration Date: 04/09/14**  
**Revised Report Date: 07/05/11**

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

*(Revised)*

Rendered to:  
COEUR D'ALENE WINDOW  
3808 N. Sullivan Rd.  
Spokane Valley, Washington 99216

Report Number: 98489.04-901-45  
Simulation Date: 04/09/10  
Original Report Date: 04/09/10  
Expiration Date: 04/09/14  
Revised Report Date: 07/05/11

**Project Summary:**

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

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

**Standards:**

*NFRC 100-2010: Procedure for Determining Fenestration Product U-Factors*  
*NFRC 200-2010: Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence*  
*NFRC 500-2010: Procedure for Determining Fenestration Product Condensation Resistance Values*

**Software:**

**Frame and Edge Modeling:** THERM 6.3.19  
**Center-of-Glass Modeling:** WINDOW 6.3.9  
**Total Product Calculations:** WINDOW 6.3.9  
**Spectral Data Library:** 18.2

**Simulations Specimen Description:**

**Series/Model:** 4600 Double Hung  
**Type:** Vertical Slider , Double Hung  
**Frame Material:** VY Vinyl  
**Sash Material:** VP Vinyl w/ Reinforcement - Partial  
**Standard Size:** 1200mm x 1500mm

**Technical Interpretations:**

None

**Modeling Assumptions:**

- 1) The 8 mm x 25 mm Aluminum Contour Grid, the 5.5 mm x 18 mm Aluminum Contour Grid, the 3/16" x 5/8" Aluminum Rectangular Grid and the 1/4" x 5/16" Aluminum Rectangular Grid were grouped for simulation purposes according to NFRC 100-2010 Section 4.2.4.4.
- 2) The 4600 DH and the 4700 DS are multi-purpose products and can be grouped within a validation matrix according to NFRC 100-2010 Section 4.2.3.2.

**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	0.004341	0.007009	0.009519
SHGC1	0.736340	0.657197	0.582735
VT0	0.000000	0.000000	0.000000
VT1	0.731999	0.650188	0.573216

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

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

**Validation Matrix:**

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

<i>Product Line</i>	<i>Report Number</i>
4600 Double Hung	98489.04-901-45
4700 Double Slider	98490.04-901-45

### Spacer Option Description

<i>Spacer Type</i>	<i>Sealant</i>		<i>Desiccant</i>
	<i>Primary</i>	<i>Secondary</i>	
Cardinal XL Edge Spacer	ADCO PIB-8 HSNB	Silicone	Yes

### Grid Option Description

<i>Grid Size</i>	<i>Grid Type</i>	<i>Grid Pattern</i>
8 mm x 25 mm	Aluminum Contour Grid	NFRC Standard
5.5 mm x 18	Aluminum Contour Grid	NFRC Standard
3/16" x 5/8"	Aluminum Rectangular Grid	NFRC Standard
1/4" x 5/16"	Aluminum Rectangular Grid	NFRC Standard

### Reinforcement Option Description

<i>Location</i>	<i>Material</i>
Interlock, bottom rail	Aluminum

### Gas Filling Technique Description

<i>Fill Type</i>	<i>Method</i>
90% Argon	Evacuated Chamber
65% Kry / 22% Arg	Evacuated Chamber

### Edge-of-Glass Construction

<i>Interior Condition</i>	Foam tape against glass
<i>Exterior Condition</i>	PVC glazing bead against glass

### Weatherstripping

<i>Type</i>	<i>Quantity</i>	<i>Location</i>
Mohair	2 rows	Jambs
Mohair	1 row	Head, sill, stiles; top, lock and bottom rails
Foam filled bulb gasket	1 row	Keeper rail

### Frame/Sash Materials Finish

<i>Interior</i>	PVC
<i>Exterior</i>	PVC

**NFRC 100/200/500 Summary Sheet  
4600 Double 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)				
1	clr/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90		CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.59				VT (N) 0.61		CR 46		
	clr/arg/clr - ds - 3/4"											
	0.117	0.500	0.117					ARG90		CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.57				VT (N) 0.60		CR 46		
	clr/arg/clr - 4mm - 3/4"											
	0.160	0.438	0.160					ARG90		CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.56				VT (N) 0.60		CR 46		
2	clr/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90		CL	SS-D	G
	U-Factor 0.45			SHGC (<1 / >1) 0.52 / 0.46				VT (<1 / >1) 0.54 / 0.48		CR 46		
	clr/arg/clr - ds - 3/4"											
	0.117	0.500	0.117					ARG90		CL	SS-D	G
	U-Factor 0.45			SHGC (<1 / >1) 0.51 / 0.46				VT (<1 / >1) 0.54 / 0.47		CR 46		
	clr/arg/clr - 4mm - 3/4"											
	0.160	0.438	0.160					ARG90		CL	SS-D	G
	U-Factor 0.45			SHGC (<1 / >1) 0.50 / 0.44				VT (<1 / >1) 0.53 / 0.47		CR 46		
3	clr/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90		CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.55				VT (N) 0.59		CR 45		
4	clr/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90		CL	SS-D	G
	U-Factor 0.45			SHGC (<1 / >1) 0.49 / 0.44				VT (<1 / >1) 0.53 / 0.46		CR 45		
5	clr/arg/clr - 6mm - 7/8"											
	0.223	0.375	0.223					ARG90		CL	SS-D	N
	U-Factor 0.45			SHGC (N) 0.53				VT (N) 0.58		CR 43		
6	clr/arg/clr - 6mm - 7/8"											
	0.223	0.375	0.223					ARG90		CL	SS-D	G
	U-Factor 0.47			SHGC (<1 / >1) 0.47 / 0.42				VT (<1 / >1) 0.52 / 0.46		CR 43		

**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
7	E240/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.057(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.19				VT (N) 0.29			CR 58	
	clr/arg/E240 - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.057(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.39				VT (N) 0.29			CR 58	
	E240/arg/clr - ds - 3/4"											
	0.118	0.500	0.117					ARG90	0.057(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.19				VT (N) 0.29			CR 58	
	clr/arg/E240 - ds - 3/4"											
	0.117	0.500	0.118					ARG90	0.057(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.38				VT (N) 0.29			CR 58	
E240/arg/clr - 4mm - 3/4"												
0.154	0.438	0.160					ARG90	0.057(#2)	CL	SS-D	N	
U-Factor 0.31			SHGC (N) 0.19				VT (N) 0.28			CR 58		
clr/arg/E240 - 4mm - 3/4"												
0.160	0.438	0.154					ARG90	0.057(#3)	CL	SS-D	N	
U-Factor 0.31			SHGC (N) 0.37				VT (N) 0.28			CR 58		
8	E240/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.057(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.26 / 0.23			CR 58	
	clr/arg/E240 - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.057(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.35 / 0.31				VT (<1 / >1) 0.26 / 0.23			CR 58	
	E240/arg/clr - ds - 3/4"											
	0.118	0.500	0.117					ARG90	0.057(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.26 / 0.23			CR 58	
	clr/arg/E240 - ds - 3/4"											
	0.117	0.500	0.118					ARG90	0.057(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.34 / 0.30				VT (<1 / >1) 0.26 / 0.23			CR 58	

**NFRC 100/200/500 Summary Sheet**  
**4600 Double 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	
	E240/arg/clr - 4mm - 3/4"											
	0.154	0.438	0.160					ARG90	0.057(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.25 / 0.22			CR 58	
	clr/arg/E240 - 4mm - 3/4"											
	0.160	0.438	0.154					ARG90	0.057(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.33 / 0.29				VT (<1 / >1) 0.25 / 0.22			CR 58	
9	E240/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.057(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.18				VT (N) 0.28			CR 56	
	clr/arg/E240 - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.057(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.37				VT (N) 0.28			CR 56	
10	E240/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.057(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.25 / 0.22			CR 56	
	clr/arg/E240 - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.057(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.33 / 0.29				VT (<1 / >1) 0.25 / 0.22			CR 56	
11	E240/arg/clr - 6mm - 7/8"											
	0.224	0.375	0.223					ARG90	0.057(#2)	CL	SS-D	N
	U-Factor 0.32			SHGC (N) 0.19				VT (N) 0.27			CR 54	
	clr/arg/E240 - 6mm - 7/8"											
	0.223	0.375	0.224					ARG90	0.057(#3)	CL	SS-D	N
	U-Factor 0.32			SHGC (N) 0.35				VT (N) 0.27			CR 54	
12	E240/arg/clr - 6mm - 7/8"											
	0.224	0.375	0.223					ARG90	0.057(#2)	CL	SS-D	G
	U-Factor 0.35			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.24 / 0.21			CR 53	
	clr/arg/E240 - 6mm - 7/8"											
	0.223	0.375	0.224					ARG90	0.057(#3)	CL	SS-D	G
	U-Factor 0.35			SHGC (<1 / >1) 0.32 / 0.28				VT (<1 / >1) 0.24 / 0.21			CR 53	

**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
13	E270/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.037(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.52			CR 58	
	clr/arg/E270 - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.037(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.34				VT (N) 0.52			CR 58	
	E270/arg/clr - ds - 3/4"											
	0.118	0.500	0.117					ARG90	0.037(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.51			CR 58	
	clr/arg/E270 - ds - 3/4"											
	0.117	0.500	0.118					ARG90	0.037(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.34				VT (N) 0.51			CR 58	
E270/arg/clr - 4mm - 3/4"												
0.157	0.438	0.160					ARG90	0.037(#2)	CL	SS-D	N	
U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.51			CR 58		
clr/arg/E270 - 4mm - 3/4"												
0.160	0.438	0.157					ARG90	0.037(#3)	CL	SS-D	N	
U-Factor 0.31			SHGC (N) 0.33				VT (N) 0.51			CR 58		
14	E270/arg/clr - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.037(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.25 / 0.22				VT (<1 / >1) 0.46 / 0.41			CR 58	
	clr/arg/E270 - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.037(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.31 / 0.28				VT (<1 / >1) 0.46 / 0.41			CR 58	
	E270/arg/clr - ds - 3/4"											
	0.118	0.500	0.117					ARG90	0.037(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.25 / 0.22				VT (<1 / >1) 0.46 / 0.40			CR 58	
	clr/arg/E270 - ds - 3/4"											
	0.117	0.500	0.118					ARG90	0.037(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.31 / 0.27				VT (<1 / >1) 0.46 / 0.40			CR 58	



**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
	E270/arg/clr - 4mm - 3/4"											
	0.157	0.438	0.160					ARG90	0.037(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.24 / 0.22				VT (<1 / >1) 0.45 / 0.40			CR	58
	clr/arg/E270 - 4mm - 3/4"											
	0.160	0.438	0.157					ARG90	0.037(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.30 / 0.27				VT (<1 / >1) 0.45 / 0.40			CR	58
15	E270/arg/clr - 5mm - 7/8"											
	0.197	0.500	0.187					ARG90	0.037(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.50			CR	56
	clr/arg/E270 - 5mm - 7/8"											
	0.187	0.500	0.197					ARG90	0.037(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.33				VT (N) 0.50			CR	56
16	E270/arg/clr - 5mm - 7/8"											
	0.197	0.500	0.187					ARG90	0.037(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.24 / 0.22				VT (<1 / >1) 0.45 / 0.39			CR	56
	clr/arg/E270 - 5mm - 7/8"											
	0.187	0.500	0.197					ARG90	0.037(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.30 / 0.27				VT (<1 / >1) 0.45 / 0.39			CR	56
17	E270/arg/clr - 6mm - 7/8"											
	0.236	0.375	0.223					ARG90	0.037(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.50			CR	54
	clr/arg/E270 - 6mm - 7/8"											
	0.223	0.375	0.236					ARG90	0.037(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.33				VT (N) 0.50			CR	54
18	E270/arg/lamiClr - 6mm/DS030DS - 7/8"											
	0.236	0.375	0.264					ARG90	0.037(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.27				VT (N) 0.50			CR	54
	E270/arg/clr - 6mm - 7/8"											
	0.236	0.375	0.223					ARG90	0.037(#2)	CL	SS-D	G
	U-Factor 0.35			SHGC (<1 / >1) 0.24 / 0.22				VT (<1 / >1) 0.44 / 0.39			CR	54

**NFRC 100/200/500 Summary Sheet**  
**4600 Double 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	
	clr/arg/E270 - 6mm - 7/8"											
	0.223	0.375	0.236					ARG90	0.037(#3)	CL	SS-D	G
	U-Factor 0.35			SHGC (<1 / >1) 0.29 / 0.26				VT (<1 / >1) 0.44 / 0.39			CR 54	
	E270/arg/lamiClr - 6mm/DS030DS - 7/8"											
	0.236	0.375	0.264					ARG90	0.037(#2)	CL	SS-D	G
U-Factor 0.35			SHGC (<1 / >1) 0.24 / 0.22				VT (<1 / >1) 0.44 / 0.39			CR 54		
19	E366/arg/cclr - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.022(#2)	CL	SS-D	N,G
	U-Factor 0.30			SHGC (N / <1 / >1) 0.20 / 0.18 / 0.17				VT (N / <1 / >1) 0.48 / 0.43 / 0.38			CR 58	
	clr/arg/E366 - ss - 3/4"											
	0.087	0.563	0.087					ARG90	0.022(#3)	CL	SS-D	N,G
U-Factor 0.30			SHGC (N / <1 / >1) 0.29 / 0.26 / 0.23				VT (N / <1 / >1) 0.48 / 0.43 / 0.38			CR 58		
20	E366/arg/cclr - ds - 3/4"											
	0.117	0.500	0.117					ARG90	0.022(#2)	CL	SS-D	N,G
	U-Factor 0.30			SHGC (N / <1 / >1) 0.20 / 0.18 / 0.17				VT (N / <1 / >1) 0.47 / 0.42 / 0.37			CR 57	
	clr/arg/E366 - ds - 3/4"											
	0.117	0.500	0.117					ARG90	0.022(#3)	CL	SS-D	N,G
U-Factor 0.30			SHGC (N / <1 / >1) 0.29 / 0.26 / 0.23				VT (N / <1 / >1) 0.47 / 0.42 / 0.37			CR 57		
21	E366/arg/cclr - ds - 3/4" - Contour 8 mm x 25 mm											
	0.117	0.500	0.117					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.31			SHGC (<1 / >1) 0.18 / 0.17				VT (<1 / >1) 0.42 / 0.37			CR 57	
	clr/arg/E366 - ds - 3/4" - Contour 8 mm x 25 mm											
	0.117	0.500	0.117					ARG90	0.022(#3)	CL	SS-D	G
U-Factor 0.31			SHGC (<1 / >1) 0.26 / 0.23				VT (<1 / >1) 0.42 / 0.37			CR 57		
22	E366/arg/cclr - 4mm - 3/4"											
	0.153	0.438	0.160					ARG90	0.022(#2)	CL	SS-D	N,G
	U-Factor 0.30			SHGC (N / <1 / >1) 0.21 / 0.19 / 0.17				VT (N / <1 / >1) 0.47 / 0.42 / 0.37			CR 57	
	clr/arg/E366 - 4mm - 3/4"											
	0.160	0.438	0.153					ARG90	0.022(#3)	CL	SS-D	N,G
U-Factor 0.30			SHGC (N / <1 / >1) 0.29 / 0.26 / 0.23				VT (N / <1 / >1) 0.47 / 0.42 / 0.37			CR 57		

**NFRC 100/200/500 Summary Sheet**  
**4600 Double 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	
23	E366/arg/clr - 4mm - 3/4" - Contour 5.5 mm x 18 mm											
	0.153	0.438	0.160					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.31			SHGC (<1 / >1) 0.19 / 0.17				VT (<1 / >1) 0.42 / 0.37			CR 57	
	clr/arg/E366 - 4mm - 3/4" - Contour 5.5 mm x 18 mm											
	0.160	0.438	0.153					ARG90	0.022(#3)	CL	SS-D	G
	U-Factor 0.31			SHGC (<1 / >1) 0.26 / 0.23				VT (<1 / >1) 0.42 / 0.37			CR 57	
24	E366/arg/clr - 4mm - 3/4" - Contour 8 mm x 25 mm											
	0.153	0.438	0.160					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.19 / 0.17				VT (<1 / >1) 0.42 / 0.37			CR 57	
	clr/arg/E366 - 4mm - 3/4" - Contour 8 mm x 25 mm											
	0.160	0.438	0.153					ARG90	0.022(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.26 / 0.23				VT (<1 / >1) 0.42 / 0.37			CR 57	
25	E366/arg/clr - 4mm - 3/4" - Rectangular 1/4" x 5/16"											
	0.153	0.438	0.160					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.31			SHGC (<1 / >1) 0.19 / 0.17				VT (<1 / >1) 0.42 / 0.37			CR 57	
	clr/arg/E366 - 4mm - 3/4" - Rectangular 1/4" x 5/16"											
	0.160	0.438	0.153					ARG90	0.022(#3)	CL	SS-D	G
	U-Factor 0.31			SHGC (<1 / >1) 0.26 / 0.23				VT (<1 / >1) 0.42 / 0.37			CR 57	
26	E366/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.022(#2)	CL	SS-D	N
	U-Factor 0.30			SHGC (N) 0.20				VT (N) 0.47			CR 56	
	clr/arg/E366 - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.022(#3)	CL	SS-D	N
	U-Factor 0.30			SHGC (N) 0.29				VT (N) 0.47			CR 56	
27	E366/arg/clr - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.18 / 0.17				VT (<1 / >1) 0.41 / 0.36			CR 56	
	clr/arg/E366 - 5mm - 7/8"											
	0.187	0.500	0.187					ARG90	0.022(#3)	CL	SS-D	G
	U-Factor 0.32			SHGC (<1 / >1) 0.26 / 0.23				VT (<1 / >1) 0.41 / 0.36			CR 56	

**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
28	E366/arg/clr - 6mm - 7/8"											
	0.225	0.375	0.223					ARG90	0.022(#2)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.21				VT (N) 0.46			CR 54	
	clr/arg/E366 - 6mm - 7/8"											
	0.223	0.375	0.225					ARG90	0.022(#3)	CL	SS-D	N
	U-Factor 0.31			SHGC (N) 0.28				VT (N) 0.46			CR 54	
29	E366/arg/clr - 6mm - 7/8"											
	0.225	0.375	0.223					ARG90	0.022(#2)	CL	SS-D	G
	U-Factor 0.34			SHGC (<1 / >1) 0.19 / 0.17				VT (<1 / >1) 0.41 / 0.36			CR 54	
	clr/arg/E366 - 6mm - 7/8"											
	0.223	0.375	0.225					ARG90	0.022(#3)	CL	SS-D	G
	U-Factor 0.34			SHGC (<1 / >1) 0.25 / 0.23				VT (<1 / >1) 0.41 / 0.36			CR 54	
30	E366/arg/clr/arg/E366 - ss - 7/8"											
	0.087	0.297	0.087	0.297	0.087			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.24			SHGC (N) 0.18				VT (N) 0.35			CR 62	
31	E366/arg/clr/arg/E366 - ss - 7/8"											
	0.087	0.297	0.087	0.297	0.087			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.25			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.31 / 0.27			CR 62	
32	E366/arg/clr/arg/E366 - ds - 7/8"											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.26			SHGC (N) 0.18				VT (N) 0.34			CR 62	
33	E366/arg/clr/arg/E366 - ds - 7/8"											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.30 / 0.27			CR 62	
34	E366/arg/i81 - ss/ds - 3/4"											
	0.087	0.531	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.43 / 0.38 / 0.33			CR 46	
35	E366/arg/i81 - ss/ds - 3/4" - Contour 8 mm x 25 mm											
	0.087	0.531	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.38 / 0.33			CR 46	

**NFRC 100/200/500 Summary Sheet  
4600 Double 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)				
36	E366/arg/i81 - ds - 3/4"											
	0.117	0.500	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.38 / 0.33		CR		45
37	E366/arg/i81 - ds - 3/4" - Contour 8 mm x 25 mm											
	0.117	0.500	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.38 / 0.33		CR		45
38	E366/arg/i81 - 4mm/ds - 3/4"											
	0.153	0.469	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.19 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.37 / 0.33		CR		46
39	E366/arg/i81 - 4mm/ds - 3/4" - Contour 8 mm x 25 mm											
	0.153	0.469	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33		CR		45
40	E366/arg/i81 - 4mm - 3/4"											
	0.153	0.438	0.160					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.19 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.37 / 0.33		CR		45
41	E366/arg/i81 - 4mm - 3/4" - Contour 8 mm x 25 mm											
	0.153	0.438	0.160					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.28			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33		CR		45
42	E366/arg/i81 - 4mm/5mm - 3/4"											
	0.153	0.406	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N
	U-Factor 0.27			SHGC (N) 0.19				VT (N) 0.42		CR		44
43	E366/arg/i81 - 4mm/5mm - 3/4" - Contour 8mm x 25 mm											
	0.153	0.406	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.29			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33		CR		44
44	E366/arg/i81 - 4mm/5mm - 3/4" - Rectangular 3/16" x 5/8"											
	0.153	0.406	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33		CR		44
45	E366/arg/i81 - ss/ds - 7/8"											
	0.087	0.656	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.43 / 0.38 / 0.33		CR		44

**NFRC 100/200/500 Summary Sheet  
4600 Double 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)				
46	E366/arg/i81 - ds - 7/8"											
	0.117	0.625	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.38 / 0.33		CR 46		
47	E366/arg/i81 - 4mm - 7/8"											
	0.153	0.563	0.160					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.37 / 0.33		CR 45		
48	E366/arg/i81 - 4mm/5mm - 7/8"											
	0.153	0.531	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.26			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.37 / 0.33		CR 45		
49	E366/arg/i81 - 4mm/5mm - 7/8" - Contour 8 mm x 25 mm											
	0.153	0.531	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.27			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33		CR 45		
50	E366/arg/E366/arg/i81 - ss/ds/ds - 7/8"											
	0.087	0.266	0.117	0.266	0.117			ARG90	0.022(#2) / 0.022(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.23			SHGC (N) 0.15				VT (N) 0.31		CR 53		
51	E366/arg/E366/arg/i81 - ss/ds/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.266	0.117	0.266	0.117			ARG90	0.022(#2) / 0.022(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.24			SHGC (<1 / >1) 0.13 / 0.12				VT (<1 / >1) 0.27 / 0.24		CR 53		
52	E366/arg/E366/arg/i81 - ds - 7/8"											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.24			SHGC (N) 0.15				VT (N) 0.30		CR 51		
53	E366/arg/E366/arg/i81 - ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.24			SHGC (<1 / >1) 0.13 / 0.12				VT (<1 / >1) 0.27 / 0.24		CR 51		
54	E366/arg/clr/arg/E366 - ss - 7/8"											
	0.087	0.297	0.087	0.297	0.087			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.22			SHGC (N) 0.18				VT (N) 0.35		CR 67		
55	E366/arg/clr/arg/E366 - ss - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.297	0.087	0.297	0.087			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.23			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.31 / 0.27		CR 67		

**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
56	E366/arg/clr/arg/E366 - ds - 7/8"											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.24			SHGC (N) 0.18				VT (N) 0.34			CR 64	
57	E366/arg/clr/arg/E366 - ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.117	0.250	0.117			ARG90	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.25			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.30 / 0.27			CR 64	
58	E366/arg-kry/clr/arg-kry/E366 - ss - 7/8"											
	0.087	0.297	0.087	0.297	0.087			AR322/65	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.19			SHGC (N) 0.18				VT (N) 0.35			CR 67	
59	E366/arg-kry/clr/arg-kry/E366 - ss - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.297	0.087	0.297	0.087			AR322/65	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.20			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.31 / 0.27			CR 67	
60	E366/arg-kry/clr/arg-kry/E366 - ds - 7/8"											
	0.117	0.250	0.117	0.250	0.117			AR322/65	0.022(#2) / 0.022(#5)	CL	SS-D	N
	U-Factor 0.21			SHGC (N) 0.18				VT (N) 0.34			CR 68	
61	E366/arg-kry/clr/arg-kry/E366 - ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.117	0.250	0.117			AR322/65	0.022(#2) / 0.022(#5)	CL	SS-D	G
	U-Factor 0.21			SHGC (<1 / >1) 0.16 / 0.15				VT (<1 / >1) 0.30 / 0.27			CR 68	
62	E366/arg/E179/arg/i81 - ss/ss/ds - 7/8"											
	0.087	0.281	0.087	0.281	0.117			ARG90	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.21			SHGC (N) 0.17				VT (N) 0.38			CR 53	
63	E366/arg/E179/arg/i81 - ss/ss/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.281	0.087	0.281	0.117			ARG90	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.22			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 53	
64	E366/arg/E179/arg/i81 - ds/ds/ds - 7/8"											
	0.117	0.250	0.122	0.250	0.117			ARG90	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.22			SHGC (N) 0.17				VT (N) 0.37			CR 51	
65	E366/arg/E179/arg/i81 - ds/ds/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.122	0.250	0.117			ARG90	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.23			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 51	

**NFRC 100/200/500 Summary Sheet**  
**4600 Double 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	
66	E366/arg-kry/E179/arg-kry/i81 - ss/ss/ds - 7/8"											
	0.087	0.281	0.087	0.281	0.117			AR322/65	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.19			SHGC (N) 0.17				VT (N) 0.38			CR 57	
67	E366/arg-kry/E179/arg-kry/i81 - ss/ss/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.281	0.087	0.281	0.117			AR322/65	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.19			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 57	
68	E366/arg-kry/E179/arg-kry/i81 - ds/ds/ds - 7/8"											
	0.117	0.250	0.122	0.250	0.117			AR322/65	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.20			SHGC (N) 0.17				VT (N) 0.37			CR 55	
69	E366/arg-kry/E179/arg-kry/i81 - ds/ds/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.122	0.250	0.117			AR322/65	0.022(#2) / 0.11(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.20			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 55	
70	E366/arg/E180/arg/i81 - ss/ss/ds - 7/8"											
	0.087	0.281	0.087	0.281	0.117			ARG90	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.21			SHGC (N) 0.17				VT (N) 0.38			CR 54	
71	E366/arg/E180/arg/i81 - ss/ss/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.281	0.087	0.281	0.117			ARG90	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.22			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.34 / 0.30			CR 54	
72	E366/arg/E180/arg/i81 - ds/ds/ds - 7/8"											
	0.117	0.250	0.118	0.250	0.117			ARG90	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.22			SHGC (N) 0.17				VT (N) 0.37			CR 51	
73	E366/arg/E180/arg/i81 - ds/ds/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.118	0.250	0.117			ARG90	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.23			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 51	
74	E366/arg-kry/E180/arg-kry/i81 - ss/ss/ds - 7/8"											
	0.087	0.281	0.087	0.281	0.117			AR322/65	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.19			SHGC (N) 0.17				VT (N) 0.38			CR 58	
75	E366/arg-kry/E180/arg-kry/i81 - ss/ss/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.087	0.281	0.087	0.281	0.117			AR322/65	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.19			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.34 / 0.30			CR 58	



**NFRC 100/200/500 Summary Sheet**  
**4600 Double 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	
76	E366/arg-kry/E180/arg-kry/i81 - ds/ds/ds - 7/8"											
	0.117	0.250	0.118	0.250	0.117			AR322/65	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	N
	U-Factor 0.19			SHGC (N) 0.17				VT (N) 0.37			CR 56	
77	E366/arg-kry/E180/arg-kry/i81 - ds/ds/ds - 7/8" - Contour 5.5 mm x 18 mm											
	0.117	0.250	0.118	0.250	0.117			AR322/65	0.022(#2) / 0.068(#4) / 0.149(#6)	CL	SS-D	G
	U-Factor 0.20			SHGC (<1 / >1) 0.15 / 0.14				VT (<1 / >1) 0.33 / 0.29			CR 56	
78	E366/arg/lamiClr - 5mm/DS030DS - 7/8"											
	0.187	0.438	0.264					ARG90	0.022(#2)	CL	SS-D	N,G
	U-Factor 0.28			SHGC (N / <1 / >1) 0.20 / 0.18 / 0.17				VT (N / <1 / >1) 0.46 / 0.41 / 0.36			CR 58	
79	E366/arg-kry/lamiClr - 5mm/DS030DS - 7/8"											
	0.187	0.438	0.264					AR322/65	0.022(#2)	CL	SS-D	N,G
	U-Factor 0.27			SHGC (N / <1 / >1) 0.20 / 0.18 / 0.16				VT (N / <1 / >1) 0.46 / 0.41 / 0.36			CR 60	
80	E366/arg/i81 - ss/ds - 7/8"											
	0.087	0.656	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.24			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.43 / 0.38 / 0.33			CR 45	
81	E366/arg/i81 - ds - 7/8"											
	0.117	0.625	0.117					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.24			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.38 / 0.33			CR 46	
82	E366/arg/i81 - 4mm/5mm - 7/8"											
	0.153	0.531	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.24			SHGC (N / <1 / >1) 0.18 / 0.17 / 0.15				VT (N / <1 / >1) 0.42 / 0.37 / 0.33			CR 45	
83	E366/arg/i81 - 4mm/5mm - 7/8" - Contour 8 mm x 25 mm											
	0.153	0.531	0.187					ARG90	0.022(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.25			SHGC (<1 / >1) 0.17 / 0.15				VT (<1 / >1) 0.37 / 0.33			CR 45	
84	E180/arg/i81 - ds - 7/8"											
	0.118	0.625	0.117					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.27			SHGC (N / <1 / >1) 0.44 / 0.39 / 0.35				VT (N / <1 / >1) 0.52 / 0.46 / 0.41			CR 45	
85	E180/arg/i81 - 4mm/5mm - 7/8"											
	0.160	0.531	0.187					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.27			SHGC (N / <1 / >1) 0.42 / 0.38 / 0.34				VT (N / <1 / >1) 0.51 / 0.46 / 0.40			CR 44	

**NFRC 100/200/500 Summary Sheet  
4600 Double 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	
86	E180/arg/i81 - 4mm/5mm - 7/8" - Contour 8 mm x 25 mm											
	0.160	0.531	0.187					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.28			SHGC (<1 / >1) 0.38 / 0.34				VT (<1 / >1) 0.46 / 0.40			CR	44
87	E180/arg/i81 - ds - 7/8"											
	0.118	0.625	0.117					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.25			SHGC (N / <1 / >1) 0.44 / 0.39 / 0.35				VT (N / <1 / >1) 0.52 / 0.46 / 0.41			CR	45
88	E180/arg/i81 - 4mm/5mm - 7/8"											
	0.160	0.531	0.187					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	N,G
	U-Factor 0.25			SHGC (N / <1 / >1) 0.42 / 0.38 / 0.34				VT (N / <1 / >1) 0.51 / 0.46 / 0.40			CR	44
89	E180/arg/i81 - 4mm/5mm - 7/8" - Contour 8 mm x 25 mm											
	0.160	0.531	0.187					ARG90	0.068(#2) / 0.149(#4)	CL	SS-D	G
	U-Factor 0.26			SHGC (<1 / >1) 0.38 / 0.34				VT (<1 / >1) 0.46 / 0.40			CR	44

*Note:*

- Options #54-83, 87-89 contain foam fill in some frame/sash cavities (see drawings)

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, Inc. 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:

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Eric S. Leitner  
Simulation Technician

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

ESL:esl  
98489.04-901-45

Attachments (pages):                      This report is complete only when all attachments listed are included.  
Appendix A: Drawings and Bills of Material (5)

### Revision Log

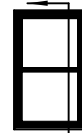
<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
.01R0	4/9/2010	All	- Original report issued
.02R0	8/3/2010	All	- Add Options #34-53
.03R0	1/5/2011	All Page 3	- Add Options #54-83 - Correct gas fill method
.04R0	7/5/2011	All	- Add Options #84-89



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

**Appendix A**

98489.04-901-45

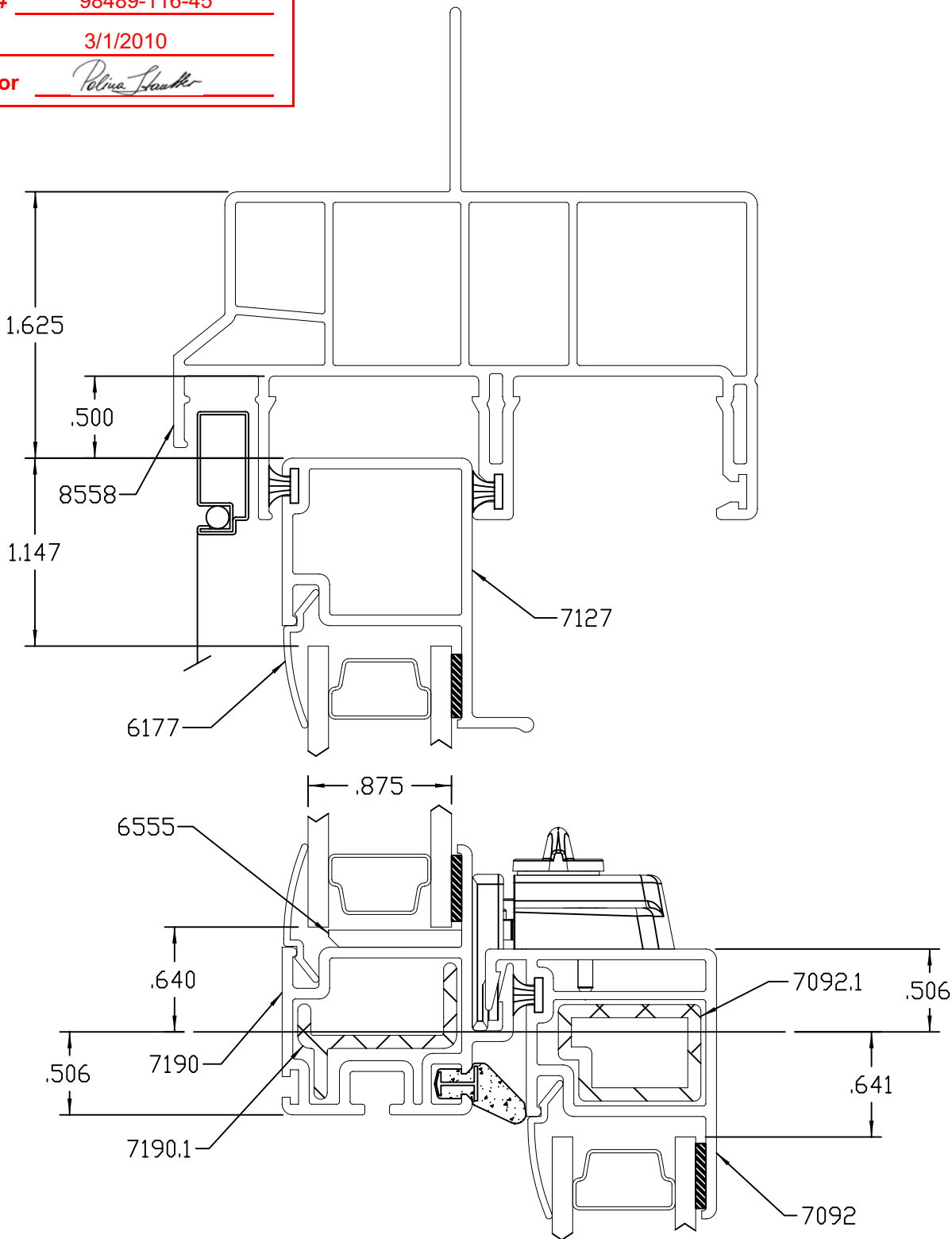


**ATI**

**Report #** 98489-116-45

**Date** 3/1/2010

**Simulator** *Polina Sautter*



VERTICAL SECTION  
UPPER VENT

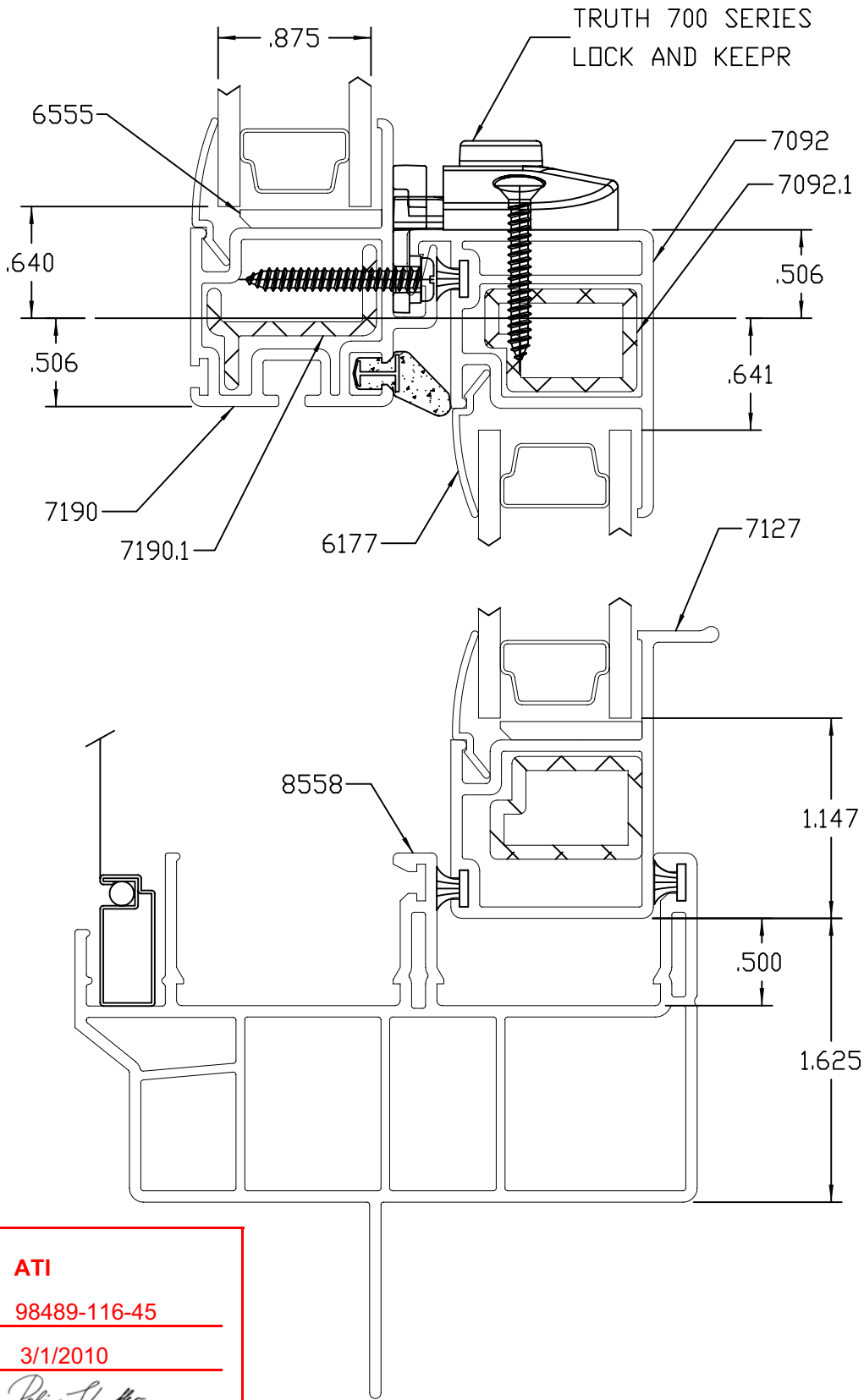
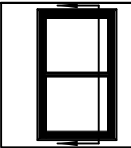
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NOTE: .015 TYPICAL CORNER RADIUS UNLESS OTHERWISE SPECIFIED

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AREA:		DRAFTED BY:	WD
WT./FT.:		FILE NAME:	E78043
DWG. NAME:			E7804.3

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a QUANTA company

SIDE LOAD DOUBLE HUNG  
10500 SERIES  
FABRICATION DRAWING



**ATI**

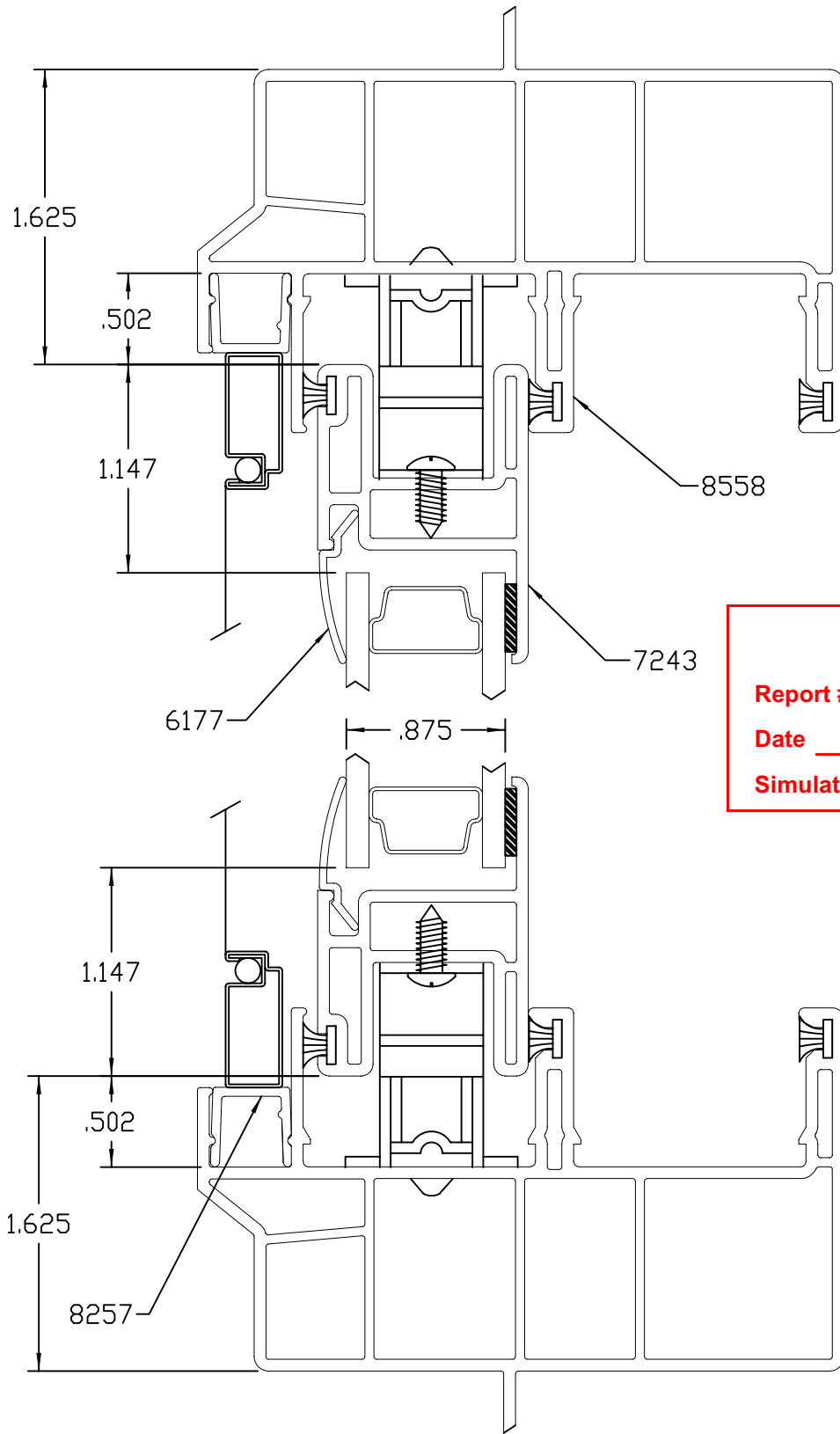
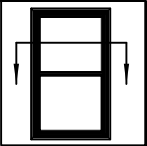
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Simulator *Polina Hauke*

VERTICAL SECTION  
LOWER VENT

<b>MIKRON</b> Quality Extruded Products <small>a Quanta Company</small>	SIDE LOAD DOUBLE HUNG 10500 SERIES DETAIL DRAWING	NOTE: .015 TYPICAL CORNER RADIUS UNLESS OTHERWISE SPECIFIED	
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**Date** 3/1/2010

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HORIZONTAL SECTION  
UPPER VENT

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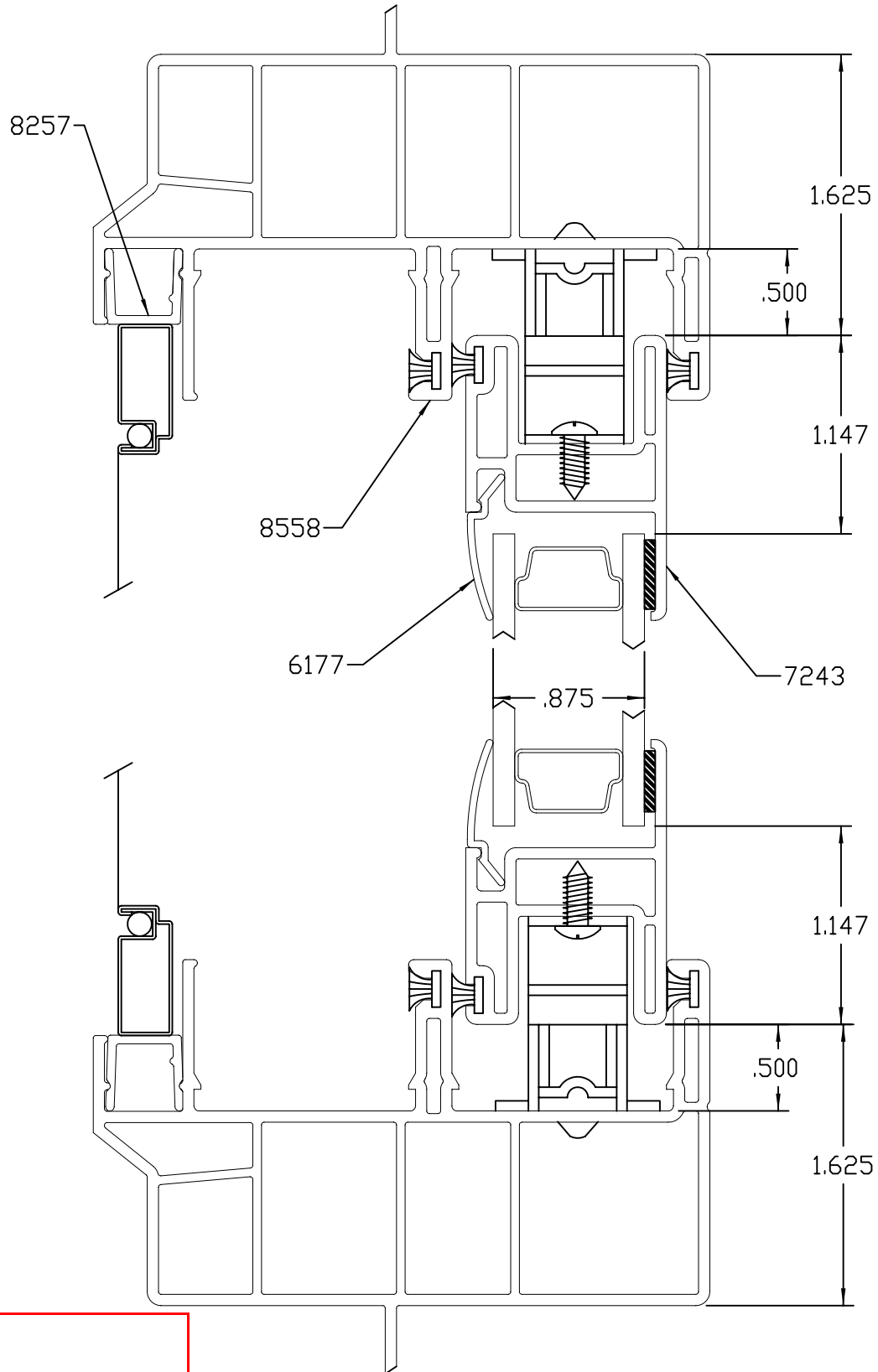
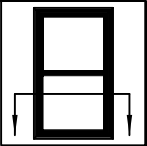
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SIDE LOAD DOUBLE HUNG  
10500 SERIES  
DETAIL DRAWING





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**Date** 3/1/2010  
**Simulator** *Polina Sautter*

HORIZONTAL SECTION  
 LOWER VENT

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**MIKRON**  
 Quality Extruded Products  
 a QUANTA Group

SIDE LOAD DOUBLE HUNG  
 10500 SERIES  
 DETAIL DRAWING

**PARTS LIST 10500 SERIES SIDE LOAD DOUBLE HUNG WINDOW**

3/1/2010

PART NO.	DESCRIPTION	COMPANY	REMARKS
8558	DHS FRAME	MIKRON IND. INC.	
7190	UPPER INTERLOCK	MIKRON IND. INC.	
7092	LOWER INTERLOCK	MIKRON IND. INC.	
7127	RAIL	MIKRON IND. INC.	
7243	STILE	MIKRON IND. INC.	
6177	GLAZING BEAD	MIKRON IND. INC.	
6555	SETTING BLOCK	MIKRON IND. INC.	
8257	SCREEN INSERT	MIKRON IND. INC.	
	WEATHERSTRIP		.240 X .187 FIN PILE
1/16x3/8	GLAZING TAPE - FOAM		
30700401.XX	CAM LOCK	TRUTH	
41426.XX	KEEPER	TRUTH	
7190.1	REINFORCING	ALUMINUM	UPPER INTERLOCK
7092.1	REINFORCING	ALUMINUM	LOWER INTERLOCK
#6x.750"	FH VINYL SCREW S.S.		LOCK
#6 X 1.250	FH VINYL SCREW S.S.		KEEPER

<b>ATI</b>	
<b>Report #</b>	<u>98489-116-45</u>
<b>Date</b>	<u>3/1/2010</u>
<b>Simulator</b>	<u><i>Palma Shanker</i></u>