Architectural Testing

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

Rendered to:
MGM INDUSTRIES

SERIES/MODEL:
4600 Double Hung

Baseline Product for Validation Testing	
Simulated Thermal Transmittance (U-Factor)	**0.30**
Unit Size:	47.25" wide by 59.00" high
Glazing Layer 1:	SS Clear
Gap 1:	0.688" DuraSeal Spacer (A8-D) - 90% Argon Fill
Glazing Layer 2:	SS Guardian RLE 71/38 (e=0.027,#3)
Gap 2:	
Glazing Layer 3:	
Notes:	

Report Number: **68234.09-116-45**
Report Date: **03/19/09**
Expiration Date: **10/09/10**

130 Derry Court
York, PA 17406-8405
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Architectural Testing

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

Rendered to:
MGM INDUSTRIES
287 Freehill Road
Hendersonville, Tennessee 37075

Report Number:	68234.09-116-45
Simulation Date:	10/09/06
Report Date:	03/19/09
Expiration Date:	10/09/10

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:	16.4

Simulations Specimen Description:

Series/Model:	4600 Double Hung
Type:	Vertical Slider , Double Hung
Frame Material:	VY Vinyl
Sash Material:	VY Vinyl
Standard Size:	1200mm x 1500mm

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Technical Interpretations:

None

Modeling Assumptions:

1) The DH31WW Double Hung is available in both equal and unequal lite configurations, per NFRC 100-2004, Section 4.2.1.I.i. This client only manufactures equal configuration of this product.

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	0.004320	0.007047	0.009616
SHGC1	0.757977	0.677667	0.602036
VT0	0.000000	0.000000	0.000000
VT1	0.753657	0.670619	0.592420

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

Product Line	*Report Number*
None	-

Spacer Option Description

	Sealant		
Spacer Type	*Primary*	*Secondary*	*Desiccant*
Standard Intercept Spacer (Dual Sealed)	PIB	Polyurethane	Yes

Grid Option Description

Grid Size	*Grid Type*	*Grid Pattern*
3/16" x 13/16"	Aluminum Rectangular Grid	NFRC
5.5mm x 18mm	Aluminum Contour Grid	NFRC

Reinforcement Option Description

Location	*Material*
None	

Gas Filling Technique Description

Fill Type	*Method*
90% Argon	Single Probe Timed

Edge-of-Glass Construction

Interior Condition	Silicone bedding between sash leg and glass
Exterior Condition	PVC glazing bead against glass

Weatherstripping

Type	*Quantity*	*Location*
Mohair	2 rows	Stiles, Top Rail, Keeper Stile
Mohair	1 row	Sill, Head Adapter, Lock Stile
Hollow Bulb Gasket	1 row	Bottom Rail

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	
1	0.116	0.563	0.118					ARG90	0.037(#3)	LE	CU-D	N,G
	U-Factor		0.30	SHGC (N / <1 / >1)			0.35 / 0.32 / 0.28		VT (N / <1 / >1)	0.53 / 0.47 / 0.42	CR	56
	0.118	0.563	0.116					ARG90	0.037(#2)	LE	CU-D	N,G
	U-Factor		0.30	SHGC (N / <1 / >1)			0.28 / 0.25 / 0.23		VT (N / <1 / >1)	0.53 / 0.47 / 0.42	CR	56
2	0.116	0.563	0.116					ARG90	0.022(#3)	LE	CU-D	N,G
	U-Factor		0.30	SHGC (N / <1 / >1)			0.30 / 0.27 / 0.24		VT (N / <1 / >1)	0.49 / 0.43 / 0.38	CR	56
	0.116	0.563	0.116					ARG90	0.022(#2)	LE	CU-D	N,G
	U-Factor		0.30	SHGC (N / <1 / >1)			0.21 / 0.19 / 0.17		VT (N / <1 / >1)	0.49 / 0.43 / 0.38	CR	56

This report is reissued in the name of MGM Industries through written authorization of Veka Inc., to whom the original report was rendered. The original Veka Inc. report number is 68234.07-116-45.

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 the NFRC unit conversion and rounding 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:

Digitally Signed by: Polina Stauffer

Polina A. Stauffer
Simulation Technician

REVIEWED BY:

Digitally Signed by: Kristen L. Livelsberger

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

PAS:PAS
68234.09-116-45

Attachments (pages): This report is complete only when all attachments listed are included.
Appendix A: Drawings and Bills of Material (2)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
.01R0	10/10/2006	All	Original report issue
.04R0	6/13/2008	All	Added Equal Lite Configuration
.07R0	10/15/2008	All	Add Options #13-17
.09R0	3/19/2009	All	Reissued report in the name of MGM Industries

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

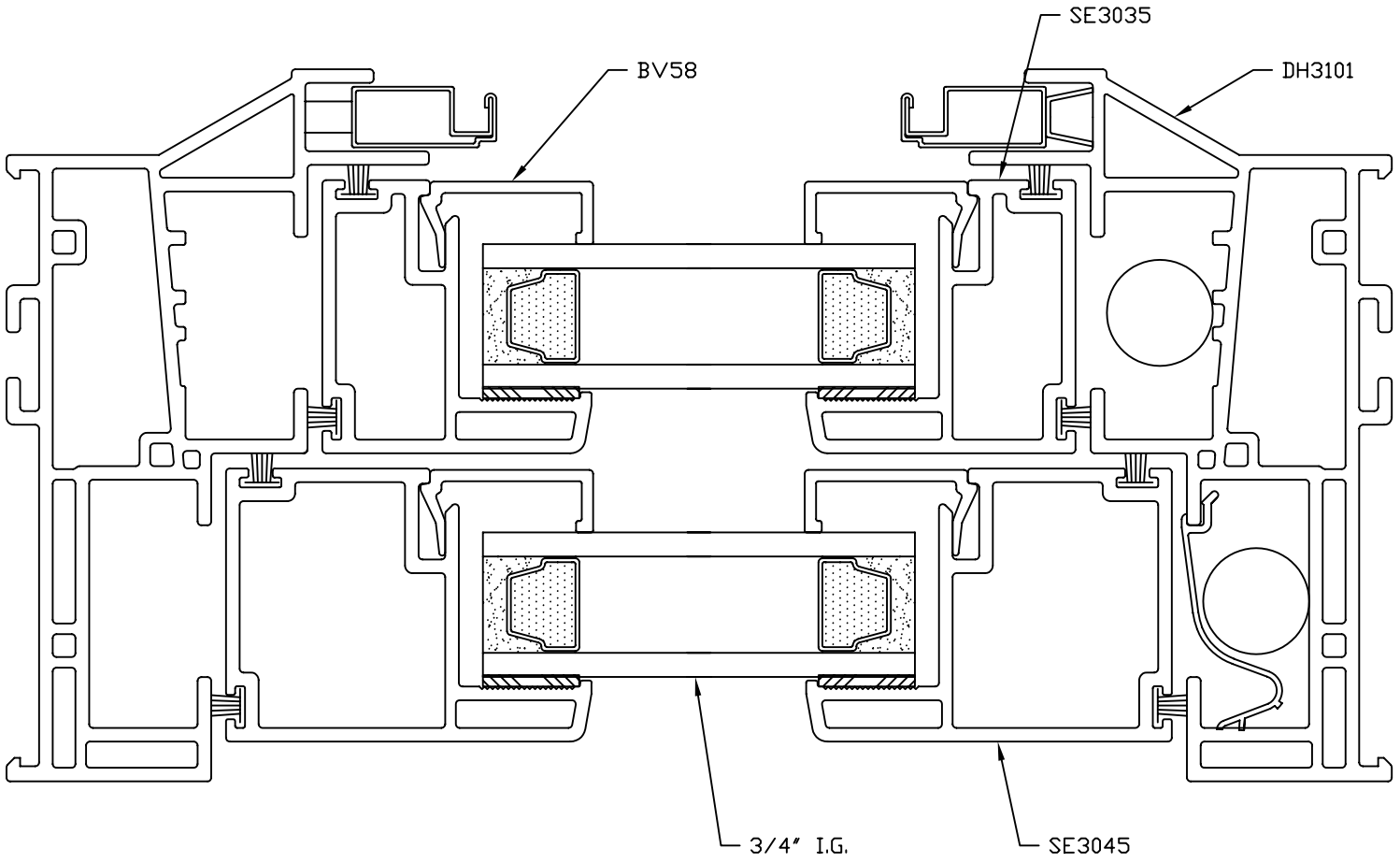
Appendix A

ATI

Report # 68234-116-45

Date 06-10-2008

Simulator

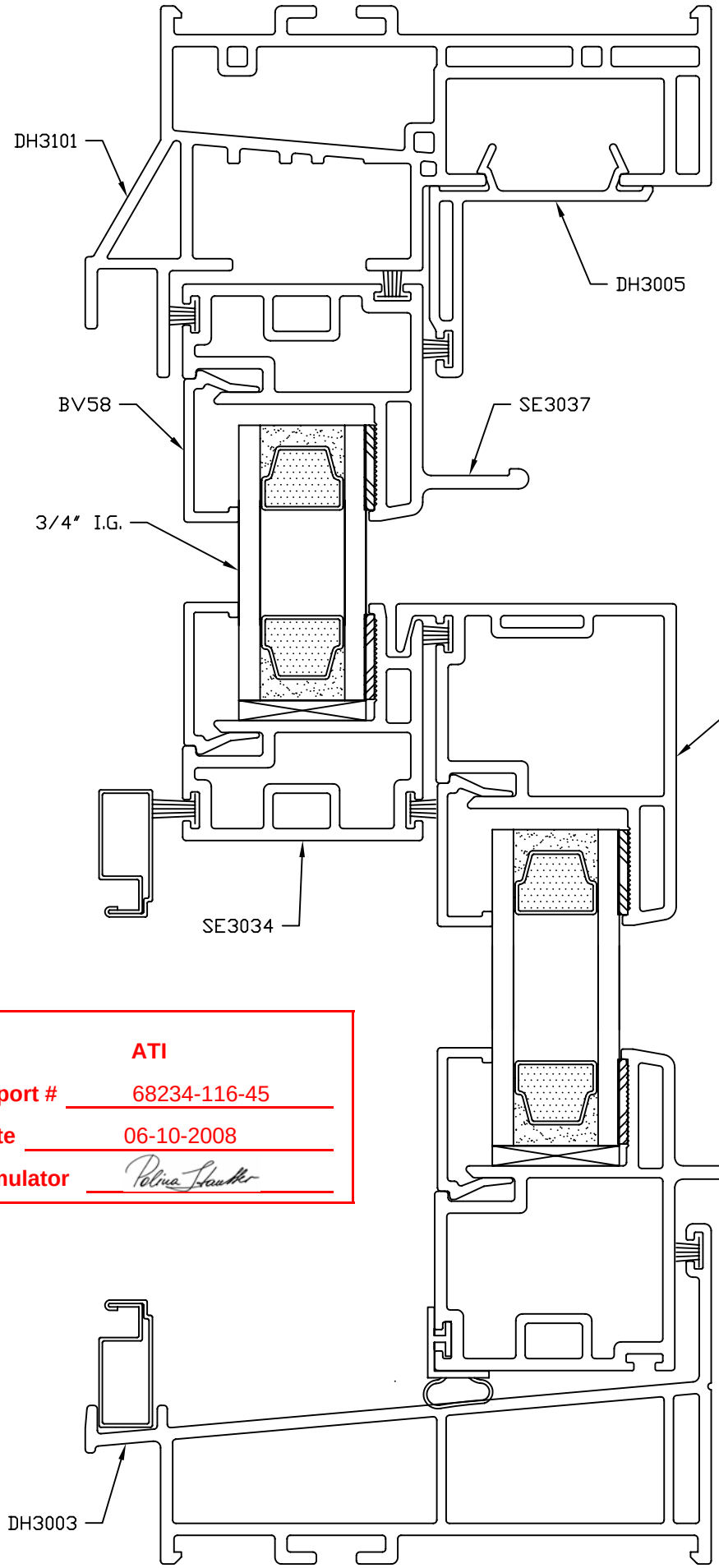


NOTE:
FOR OTHER PROFILE, GLAZING BEAD, & GLASS OPTIONS, PLEASE SEE THE LINEAL PROFILE CHARTS FOR THIS SYSTEM.

	REVISIONS	DATE

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: JMN	DATE: 31 AUG 95	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE DOUBLE HUNG DH31WW, DH31MW EQ. GLASS HORIZONTAL ASSEMBLY		DWG. # DH31WWEH



ATI

Report # 68234-116-45

Date 06-10-2008

Simulator Polina Stawitcher

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: JMN | DATE: 31 AUG 95 | SCALE: FULL | DWG. # DH31WWEV

CHK'D: | DATE: | APPV'D:

TITLE: DOUBLE HUNG DH31WW EQ. GLASS VERTICAL ASSEMBLY

REVISIONS	DATE
1. REVISED DH3003	18 SEPT 03

NOTE:
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