Westlake Royal Building Products™ | WINDOW SOLUTIONS

Magnolia Collection

800 Series – New Construction





- Dual point locking hardware
- All welded frame and sash
- Internal weep system
- Adjustable tandem rollers
- New construction nail fin
- Field reversible OX, XO XO, OX, OXO, OXXO configurations
- Steel reinforcing
- Dual weatherstripping
- Exterior glazed
- Integral screen track
- Vinyl threshold cover
- AAMA/FGIA certified components
- NFRC certified for superior thermal efficiency
- TDI and Florida approved
- Available colors: white, tan, clay, black exterior/white interior



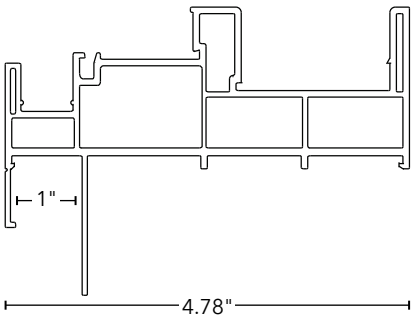


DOOR CONFIGURATIONS	AAMA	
	W x H	RATING
XO	73 x 97	D.P. 40
XO	97 x 97	D.P. 25
XO	72 x 80	D.P. 50
XO	96 x 80	D.P. 40
XO	96 x 96	D.P. 25
OXO	108 x 80	D.P. 50
OXO	109 x 97	D.P. 40
OXXO	143 x 80	D.P. 30

THERMAL PERFORMANCE

CONFIGURATIONS	U-FACTOR	SOLAR HEAT GAIN
Low-E/Air/CLR	0.31	0.23
*Low-E/Argon/CLR	0.28	0.20
**Low-E/Air/Low-E	0.26	0.22
**Low-E/Argon/Low-E	0.23	0.22

* Qualifies for ENERGY STAR South and South Central
** Qualifes for ENERGY STAR all zones



Frame Head and Jamb

WestlakeRoyalWindows.com
1000 Pyratich Drive • Baldwin, GA • PH: 706.778.1200 • FX: 706.776.6226

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Royal Window Solutions™

Westlake Royal Windows LLC

Multi- Family Construction Projects

LIFETIME LIMITED WARRANTY ("WARRANTY")

Vinyl (frame) Windows manufactured by Westlake Royal Windows LLC ("Westlake Royal") are free of defects in design, materials, and workmanship and fit for reasonable purposes for which intended at the time of shipment from our plants in Dallas, Carrollton, Houston, Texas and Baldwin, GA, as set out below.

WHAT WILL WE DO

Any Warranty claim should be presented to Westlake Royal in a timely manner. Thereafter, Westlake Royal will inspect the alleged defect. If the claim is within the Warranty, Westlake Royal will at its option, repair, or replace any defective component without charge. The cost of removing the defective products or installing a repaired or replaced product is not covered unless claim is made within one year of original purchase. Any Warranty claim approved cannot exceed in value more than the original purchase.

WHAT WE COVER AND FOR HOW LONG

Vinyl and or aluminum used in the frames of the Westlake Royal units are warranted to the original purchaser/ developer exclusively for the original ten (10) years of use. This Warranty covers material from blistering, corroding, flaking, or rot under conditions of normal wear and use. Hardware is covered by this Warranty from all defects in design, materials and workmanship for a period of one (1) year from purchase date. Insulated Glass (10 year) from the date of purchase is warranted against defects in materials and workmanship resulting in material obstruction in vision from film formation, moisture, or dust collection between the interior glass surfaces. Specialty glass (tinted, obscure or decorative) is warranted against such defects for a period of ten years from the date of purchase. If a stress crack (glass fracture) is NOT present upon delivery to the construction site, the development of any stress crack is not a result of a manufacturing defect but results from either a handling or installation issue and is not warranted. The cost of removing the defective product or installing a repaired or replaced product is not covered unless the Warranty claim is made within one (1) year after the date of initial purchase.

WHAT WARRANTY DOES NOT COVER

1. Defects or damages attributable to external cases, such as defects caused by (a) installation, soil retention, or normal weathering; (b) accidents, fire, flood , or other acts of God, vandalism, riot or civil disorder, misuse, or abuse; (c) harmful fumes, vapors, or chemical pollutants in the atmosphere, or use of non-approved heat caused by cleaning agents; (d) mildew; (e) building settlement or structural failure of the walls or foundations; (f) stresses resulting from localized heat which cause excessive temperature differentials over glass surfaces or edges; (g) use above 6,000 feet above sea level without capillary breather tubes; (h) use in an environment subject to high vibration (e.g. swimming pool), excess salinity; or other unusual conditions; or (i) any other use or occurrence beyond Westlake Royal's control.
2. Condensation on products which occurs as the natural results of humidity within the house or building area or differences between interior orexterior temperatures does not indicate a defect in the product and is not covered by this Warranty.
3. Changes in the appearance of the hardware that are attributed to normal aging and wear do not indicate a manufacturing defect and are notcovered by this Warranty.
4. Any defects resulting from installation such as but not limited to security system installation, caulk over weep holes in the frame are not covered. It also does not cover any cost of removal or installation of a product or component part.
5. Surface imperfections are inherent in the product and if they are not noticeable within three feet of the surface and do not impact the function of the product, they are not manufacturing defects and are not covered by the Warranty
6. Westlake Royal reserves the right to discontinue or change any component. If the component of the window and patio door originally installed is not available and Westlake Royal determines to make replacement, Westlake Royal may substitute a component designated by Westlake Royal that is equal quality and value.
7. Westlake Royal has no liability beyond repair or replacement of applicable products, and repair or replacement is your sole remedy for Westlake Royal's breach of this Warranty. Westlake Royal will have no liability for any lost time, inconvenience, loss of use, personal injury, property damage, or any other incidental or consequential damage.
8. No sales representative or distributor is authorized to modify this Warranty or to extend any other Warranty on Westlake Royal products.
9. Color change due to normal weathering is excluded from this Warranty. Normal weathering is defined as any exposure to ultraviolet (sun) light, weather and atmospheric conditions which will cause any colored or painted surface to fade, darken, chalk or acquire a surface accumulation of dirt and stains. The severity of these conditions depends on air quality, location of your home and other local conditions.
10. This Warranty is the only one Westlake Royal makes and Westlake Royal expressly disclaims any other express or implied warranty, including any warranty of merchantability or fitness for a purpose.

STATE LAW RIGHTS

Some states do not allow the limitation on how long a warranty lasts or the exclusion or limitation of incidental or consequential damages, so the limitations or exclusions in paragraphs 7 and 10 may not apply to you. This Warranty gives you specific rights, and you may also have other rights which vary from state to state.

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FIELD TESTING- In the event *Westlake Royal Windows,* (Seller), windows and/or doors are subject to "Field-Testing" as a conditional requirement of the supply agreement, the following conditions are required from the Buyer:

A) Requirement of fenestration product "Field-Testing" from buyer must be provided inwriting prior to execution of any supply agreement from seller.
B) Project specification for fenestration design pressures must be provided from buyer and included in all executable documents prior to execution of any supply agreement from seller.
C) "Field-Testing" must be performed as per AAMA 502 protocol for the "Voluntary Specification for Field Testing of Newly Installed Fenestration Products"
D) Product design pressure will be determined based on the specifics of the project, not the product designation of the window.
E) All "Field-Testing" equipment must be properly calibrated and testing agency must provide proof of equipment compliance upon request
F) No more than (3) fenestration openings will be subject to "Field-Testing" unless otherwise noted and approved by Seller.
G) "Field-testing" pressures should never exceed 2/3 of the project specifications for fenestration products
H) Seller must be notified in writing two-weeks prior to any scheduled "Field-testing"
I) Buyer agrees to allow the Seller the opportunity to apply remediation on any failed fenestration products
J) Seller is not responsible for the cost or reimbursement of any related "Field-testing" fees
K) Seller is not responsible and cannot be held liable for failures on fenestration products due to installation practices that deviate from tested and accepted installation techniques

Buyer Signature _____ Date _____

Printed Name _____

Company Name _____

For additional information on AAMA (American Architectural Manufacturer's Association) see fgiaonline.org

3950 Bastille Rd Suite 100
Dallas, Texas 75212

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Krestmark® Collection

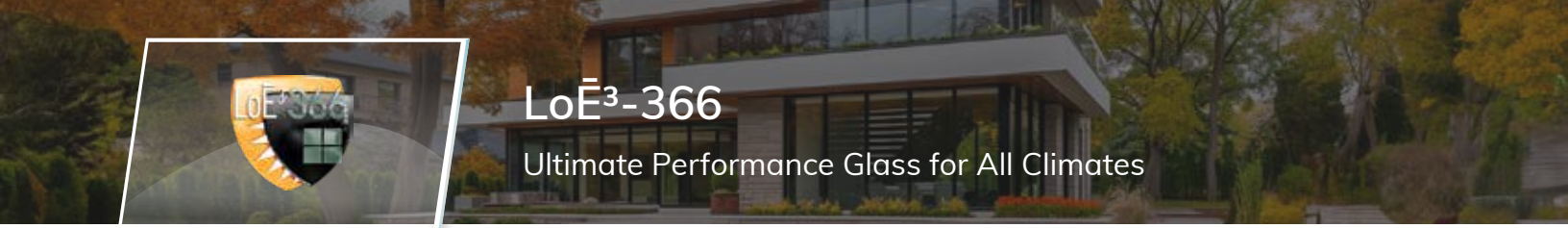
AAMA PERFORMANCE DATA

INDUSTRY STANDARD TABLE OF EQUIVALENT WIND VELOCITIES

PERFORMANCE CLASS Product performance class codes and minimum performance for window	Residential (R)											
	Light Commercial (LC)											
	Commercial (C)											
DESIGN PRESSURE RATINGS (DP RATING) The Design Pressure (DP) is the pressure measured in Pounds per Square Foot (PSF) that a building or building componet should be designed to accommodate without failure.	15	20	25	30	35	40	45	50	55	60	65	70
STRUCTURAL TEST PRESSURE IN PSF Structural Test Pressure = 1.5 x Design Pressure (DP Rating). The higher the number, the greater the amount of wind the window can sustain. This number varies with window size; be sure comparisons are with same size windows.	22.5	30	37.5	45	53.5	60	67.5	75	82.5	90	97.5	105
EQUIVALENT WIND VELOCITY IN MPH	77	88	99	108	117	125	133	140	147	153	159	165
WATER TEST PRESSURE IN PSF Water test pressure measures the windows ability to resist water penetration under specific pressure. Water test pressure = 15% of Design Pressure (DP Rating). The greater the rating, the greater the ability of the window to resist water penetration	2.86	3	3.75	4.5	5.25	6	6.75	7.5	8.25	9	9.75	10.5

3950 Bastille Road, Suite 100 • Dallas, TX 75212 • PH: 214.237.5055 • WestlakeRoyalWindows.com

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LoĒ³-366

Ultimate Performance Glass for All Climates

Cardinal LoĒ³-366® glass offers optimal solar control and high visibility, ensuring year-round comfort and energy savings. Its advanced triple-layer coating provides exceptional heat rejection and fading protection without compromising the view, making it the most popular LoĒ product.

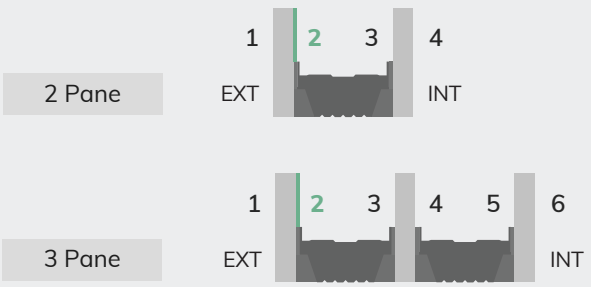
65%
Vis Trans

0.27
SHGC

0.24
U-Factor

5%
UV Transmission

Coating Position:



Data is produced using LBNL Window 7.8. 2-pane IG units have 13mm airspace and filled to 90% argon.

Benefits of LoĒ³-366

- **High Visible Light w/Solar Heat Gain**
- **Excellent UV blocking**
- **All Season Comfort**
- **Enhanced Visual Comfort**

The superior insulating capability of LoĒ³-366 is a key factor in the construction of comfortable windows for cold & warm climates. The dramatic comfort improvement from LoĒ³-366 glass also means the relative humidity of the indoor air can be controlled and maintained properly. It lets more unobstructed light in and protects from unwanted exterior air, keeping your home comfortable.

High energy efficiency	Custom shapes & sizes	Neutral color
Laminated options	Thicknesses: 2.2 to 6mm	Max dimensions: 96” x 144”

Note: LoĒ³-366 is available as annealed, heat-strengthened or tempered glass.

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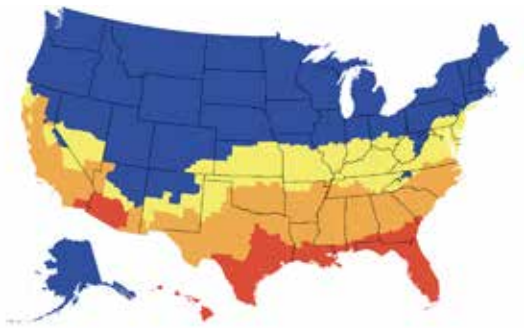
ENERGY STAR 7.0

ENERGY STAR® is a program run by the U.S. Environmental Protection Agency (EPA) that promotes energy efficiency in consumer products, including windows. ENERGY STAR 7.0 is the latest version of the ENERGY STAR program's requirements for windows.

LoĒ³-366 can be used to meet the criteria for **all four climate zones**. In the **Northern** climate zone, choose LoĒ³-366 with a triple pane IG unit.

Whole-Window Performance Criteria

	U-Factor	SHGC	
▸ Northern	≤0.22	≥0.17	Prescriptive
	=0.23	≥0.35	Equivalent Energy Performance
	=0.24		
	=0.25	≥0.40	
	=0.26		
▸ North-Central	≤0.25	≤0.40	
▸ South-Central	≤0.28	≤0.23	
▸ Southern	≤0.32	≤0.23	



3/4" Dual Pane with 3mm Glass ● 1" Triple Pane with 3mm Glass ● 90% Argon

Center-of-Glass Performance

		VISIBLE LIGHT		FADING			U-FACTOR	
		Transmission	Exterior	UV	ISO	SHGC	Air Fill IP / SI	Argon Fill IP / SI
Dual Pane	▸ LoĒ³-366 / Clear	65%	11%	5%	43%	0.27	0.29 / 1.65	0.24 / 1.37
	▸ LoĒ³-366 / LoĒ-i89	63%	11%	5%	42%	0.27	0.23 / 1.30	0.20 / 1.11
Triple Pane	▸ LoĒ³-366 / Clear / LoĒ-180	57%	15%	2%	36%	0.24	0.16 / 0.90	0.13 / 0.72
	▸ LoĒ³-366 / LoĒ-180 / LoĒ-i89	56%	15%	2%	35%	0.24	0.14 / 0.73	0.11 / 0.63

LBNL Window 7 per NFRC100 conditions. LoĒ³-366 is intended for the 2nd surface on an insulating glass unit.

ENGINEERING THE FUTURE OF GLASS

Contact Cardinal CG to learn more about LoĒ³-366 and other Cardinal glass products.

775 Prairie Center Drive, Eden Prairie, MN 55344

www.cardinalcorp.com

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AAMA PERFORMANCE DATA, 07-16-2026

Plant	Type	Series	CHS	Frame	Transom	Impact	Size	Rating	FBC 2023
KRESTMARK	SH	200/275		FIN			48x60	R-50	FL 12398-R14.04
KRESTMARK	SH	220		FINLESS			44x72	R-50	FL 12398-R14.16
KRESTMARK	SH	200/275		FIN			44x72	R-50	FL 12398-R14.06
KRESTMARK	SH	220		FINLESS			48x72	R-45	FL 12398-R14.15
KRESTMARK	SH	200/275		FIN			48x72	R-45	FL 12398-R14.01
KRESTMARK	SH	220		FINLESS			36x84	R-50	FL 12398-R14.14
KRESTMARK	SH	200/275		FIN			36x84	R-40	FL 12398-R14.07
KRESTMARK	SH	200/275		FIN			36x84	R-55	FL 12398-R14.05
KRESTMARK	SH	200/275		FIN			48x84	R-30	FL 12398-R14.02
KRESTMARK	SH	200/275		FIN			48x84	R-35	FL 12398-R14.03
KRESTMARK	SH	200/275		FIN			48x96	R-30	
KRESTMARK	SH-SH	200/275	TWIN	FIN			71x72	R-50	FL 12398-R14.12
KRESTMARK	SH-SH	220	TWIN	FINLESS			71x72	R-50	FL 12398-R14.17
KRESTMARK	SH-SH	200/275	TWIN	FIN			87x72	R-40	
KRESTMARK	SH-SH	200/275	TWIN	FIN			72x84	R-35	FL 12398-R14.11
KRESTMARK	SH-SH-SH	200/275	TRIPLE	FIN			108x72	R-50	FL 12398-R14.09
KRESTMARK	SH/PW	200/275		FIN	3860		44x96	R-35	
KRESTMARK	PW/SH	200/275		FIN	3820		44x96	R-50	FL 12398-R14.08
KRESTMARK	PW/SH-SH	200/275	TWIN	FIN	6020		72x96	R-50	FL 12398-R14.13
KRESTMARK	PW/SH-SH-SH	200/275	TRIPLE	FIN	8010		96x84	R-50	FL 12398-R14.10
KRESTMARK	HS	200/275		FIN			72x44	R-45	
KRESTMARK	HS	200/275		FIN			72x48	R-35	FL 13418-R7.1
KRESTMARK	PW	200/275		FIN			48x72	LC-70	FL 13195-R8.02
KRESTMARK	PW	200/275		FIN			72x72	LC-60	FL 13195-R8.03
KRESTMARK	PW	200/275		FIN			84x72	R-50	
KRESTMARK	PW	200/275		FIN			48x84	R-80	FL 13195-R8.05
KRESTMARK	PW	200/275		FIN			72x84	R-50	FL 13195-R8.04
KRESTMARK	PW-PW	200/275	TWIN	FIN			71x83	LC-50	
KRESTMARK	PW-PW-PW	200/275	TRIPLE	FIN			132x84	R-40	FL 13195-R8.06
KRESTMARK	PW/PW-PW	200/275	TWIN	FIN	6830		80x108	R-30	FL 13195-R8.07
KRESTMARK	PW/PW-PW	220	TWIN	FINLESS	6830		80x108	R-30	FL 13195-R8.08
KRESTMARK	SH	420		FINLESS			48x72	R-50	FL 12398-R14.25
KRESTMARK	SH	400		FIN			48x72	R-50	FL 12398-R14.19
KRESTMARK	SH	400		FIN			36x84	R-50	FL 12398-R14.18
KRESTMARK	SH	400		FIN			40x84	R-40	
KRESTMARK	SH	400		FIN			48x84	R-35	FL 12398-R14.20
KRESTMARK	SH-SH	400	TWIN	FIN			72x72	R-50	FL 12398-R14.24
KRESTMARK	SH-SH	400	TWIN	FIN			80x72	R-50	
KRESTMARK	SH-SH	400	TWIN	FIN			72x84	R-40	FL 12398-R14.23

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AAMA PERFORMANCE DATA, 07-16-2026

KRESTMARK	SH-SH-SH	400	TRIPLE	FIN			108x72	R-40	FL 12398-R14.21
KRESTMARK	SH-SH-SH	400	TRIPLE	FIN			108x72	R-35	FL 12398-R14.22
KRESTMARK	PW/SH	400		FIN	4020		48x96	R-50	WIN-1429.1
KRESTMARK	HS	400		FIN			72x44	R-50	FL 13418-R7.2
KRESTMARK	HS	400		FIN			72x48	R-45	FL 13418-R7.3
KRESTMARK	HS	400		FIN			72x60	R-30	
KRESTMARK	HS XOX	400		FIN			108x72	R-15	
KRESTMARK	PW	400		FIN			72x72	LC-60	FL 13195-R8.09
KRESTMARK	PW	400		FIN			48x84	R-65	FL 13195-R8.10
KRESTMARK	PW	400		FIN			72x84	R-50	FL 13195-R8.11
KRESTMARK	PW-PW	400	TWIN	FIN			88x84	R-50	
KRESTMARK	PW-PW	420	TWIN	FINLESS			88x84	R-50	
KRESTMARK	PW-PW-PW	400	TRIPLE	FIN			108x84	R-30	FL 13195-R8.12
KRESTMARK	PW/PW	400		FIN	4020		48x72	R-50	
KRESTMARK	PW/PW	400		FIN	6030		72x96	R-40	
KRESTMARK	PW/PW-PW	400	TWIN	FIN	6830		80x108	R-35	FL 13195-R8.13
KRESTMARK	PW/PW-PW	400	TWIN	FINLESS	6830		80x108	R-35	FL 13195-R8.13
KRESTMARK	SH	4000		FIN		IMPACT	36x72	R-60	FL 17660-R5.6
KRESTMARK	SH	4000		FIN		IMPACT	44x72	R-55	FL 17660-R5.3
KRESTMARK	SH	4000		FIN		IMPACT	48x72	R-50	FL 17660-R5.2
KRESTMARK	SH	4000		FINLESS		IMPACT	48x72	R-50	FL 17660-R5.1
KRESTMARK	SH	4000		FIN		IMPACT	36x84	R-50	FL 17660-R5.7
KRESTMARK	SH-SH	4000	MULL	FIN		IMPACT	80x72	R-50	FL 17660-R5.4
KRESTMARK	PW/SH-SH	4000	MULL	FIN	6030	IMPACT	72x108	R-50	FL 17660-R5.5
KRESTMARK	HS	4000		FIN		IMPACT	72x44	R-50	FL 43938-R1.1
KRESTMARK	PW	4000		FIN		IMPACT	72x48	R-60	
KRESTMARK	PW	4000		FIN		IMPACT	84x48	R-50	
KRESTMARK	PW	4000		FIN		IMPACT	48x72	R-60	FL 17148-R6.2
KRESTMARK	PW	4000		FIN		IMPACT	48x84	R-50	FL 17148-R6.1
KRESTMARK	CA	250		FIN			36x72	R-60	WIN-1376.1
KRESTMARK	CA	250		FIN			36x72	LC-50	
KRESTMARK	CA	250		FINLESS			36x72	LC-60	
KRESTMARK	AW	250		FIN			48x32	LC-50	
KRESTMARK	AW	250		FINLESS			48x32	LC-50	
KRESTMARK	PW	250		FIN			48x48	CW-80	
KRESTMARK	PW	250		FIN			60x60	CW-70	
KRESTMARK	PW	250		FIN			76x70	CW-50	
KRESTMARK	SGD XO	800		FIN			73x97	LC-40	FL 47517.01
KRESTMARK	SGD XO	800		FIN			97x97	LC-25	FL 47517.01
KRESTMARK	SGD XO	800		FIN			72x80	LC-50	FL 47517.02

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AAMA PERFORMANCE DATA, 07-16-2026

KRESTMARK	SGD XO	800		FIN			96x80	LC-40	FL 47517.03
KRESTMARK	SGD XO	800		FIN			96x96	LC-25	FL 47517.03
KRESTMARK	SGD OXO	800		FIN			108x80	R-50	FL 47517.04
KRESTMARK	SGD OXO	800		FIN			109x97	LC-40	FL 47517.05
KRESTMARK	SGD OXXO	800		FIN			143x80	R-30	FL 47517.06
LEGACY	SH	700		FIN			40x63	LC-50	
LEGACY	SH	700		FIN			36x72	R-50	
LEGACY	SH	700		FIN			44x72	R-45	
LEGACY	SH	700		FIN			44x72	LC-35	
LEGACY	SH	700		FIN			48x72	R-35	
LEGACY	SH	700		FIN			36x84	LC-50	
LEGACY	SH	700		FIN			36x84	LC-45	
LEGACY	SH	700		FIN			44x84	LC-25	
LEGACY	SH	700		FIN			48x84	R-35	
LEGACY	SH	700		FIN			44x96	R-35	
LEGACY	SH	700		FIN			48x96	R-30	
LEGACY	SH	700		FIN			48x96	R-15	
LEGACY	SH-SH	700	TWIN	FIN			72x72	R-40	
LEGACY	SH-SH	700	TWIN	FIN			72x72	R-50	
LEGACY	SH-SH	700	TWIN	FIN			72x84	R-30	
LEGACY	SH-SH-SH	700	TRIPLE	FIN			108x72	R-30	
LEGACY	SH-SH-SH	700	TRIPLE	FIN			108x72	R-30	
LEGACY	SH-SH-SH	700	TRIPLE	FIN			108x84	R-20	
LEGACY	PW/SH	700		FIN	4030		48x96	R-35	
LEGACY	PW-PW/SH-SH	700	TWIN	FIN	6030		72x96	R-40	
LEGACY	PW-PW-PW/SH-SH-SH	700	TRIPLE	FIN	9030		108x96	R-30	
LEGACY	HS	700		FIN			60x36	R-30	
LEGACY	HS	700		FIN			60x44	R-50	
LEGACY	HS	700		FIN			60x48	R-45	
LEGACY	HS	700		FIN			72x48	R-30	
LEGACY	HS XOX	700		FIN			96x48	R-25	
LEGACY	HS XOX	700		FIN			96x48	R-20	
LEGACY	PW	700		FIN			48x60	R-50	
LEGACY	PW	700		FIN			72x72	LC-50	
LEGACY	PW	700		FIN			72x84	CW-50	
LEGACY	PW	700		FIN			72x84	CW-60	
LEGACY	PW	700		FIN			48x96	R-45	
LEGACY	PW	700		FIN			60x96	LC-50	
LEGACY	PW-PW	700	TWIN	FIN			72x84	R-50	
LEGACY	PW-PW-PW	700	TRIPLE	FIN			108x60	R-50	

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AAMA PERFORMANCE DATA, 07-16-2026

LEGACY	**PW-PW-PW**	700	TRIPLE	FIN			108x72	R-50	
LEGACY	**PW**	7000		FIN			48x72	R-50	
LEGACY	**PW**	7000		FIN			39x84	R-50	
LEGACY	**PW**	7000		FIN		**IMPACT**	48x72	R-50	
LEGACY	**PW**	7000		FIN		**IMPACT**	39x84	R-50	
LEGACY	**SH**	250		FIN			44x72	R-35	
LEGACY	**SH**	250		FIN			36x84	R-35	
LEGACY	**SH**	250		FIN			48x96	LC-30	
LEGACY	**SH-SH**	250	TWIN	FIN			72x84	R-35	
LEGACY	**HS**	250		FIN			72x72	LC-25	
LEGACY	**HS XOX**	250		FIN			108x72	R-15	
LEGACY	**PW**	250		FIN			72x72	R-50	
LEGACY	**PW-PW**	255	TWIN	FIN			72x72	R-45	
LEGACY	**PW-PW**	255	TWIN	FIN			72x84	R-45	
LEGACY	**PW-PW-PW**	255	TRIPLE	FIN			108x60	R-45	
LEGACY	**PW-PW-PW**	255	TRIPLE	FIN			108x72	R-45	
MAGNOLIA	**SH**	400		FIN			40x63	R-35	FL 16475-R10.02
MAGNOLIA	**SH**	400		FIN			40x66	R-50	FL 16475-R10.06
MAGNOLIA	**SH**	400		FIN			36x72	R-35	FL 16475-R10.04
MAGNOLIA	**SH**	400		FIN			36x72	R-50	FL 16475-R10.05
MAGNOLIA	**SH**	400		FIN			48x72	R-20	FL 16475-R10.07
MAGNOLIA	**SH**	400		FIN			48x72	R-25	FL 16475-R10.03
MAGNOLIA	**SH**	400		FIN			48x72	R-35	FL 16475-R10.08
MAGNOLIA	**SH**	400		FIN			30x76	R-35	FL 16475-R10.03
MAGNOLIA	**SH**	400		FIN			48x84	R-20	FL 16475-R10.16
MAGNOLIA	**SH**	4000		FINLESS			48x84	R-20	FL 16475-R10.16
MAGNOLIA	**SH**	400		FIN			48x84	R-30	FL 16475-R10.06
MAGNOLIA	**SH**	4000		FINLESS			48x84	R-30	FL 16475-R10.06
MAGNOLIA	**SH-SH**	400	TWIN	FIN			80x63	R-35	FL 16475-R10.14
MAGNOLIA	**SH-SH**	400	TWIN	FIN			72x72	R-50	FL 16475-R10.15
MAGNOLIA	**SH-SH-SH**	400	TRIPLE	FIN			108x63	R-35	FL 16475-R10.11
MAGNOLIA	**SH-SH-SH**	400	TRIPLE	FIN			108x72	R-35	FL 16475-R10.10
MAGNOLIA	**SH-SH-SH**	400	TRIPLE	FIN			108x72	R-50	FL 16475-R10.12
MAGNOLIA	**SH-SH-SH**	4000	TRIPLE	FINLESS			108x84	R-20	FL 16475-R10.13
MAGNOLIA	**SH-SH-SH**	400	TRIPLE	FIN			108x84	R-20	FL 16475-R10.09
MAGNOLIA	**PW/SH**	400		FIN	2820		32x96	R-40	FL 16475-R10.01
MAGNOLIA	**PW/SH**	400		FIN	4020		48x96	R-30	FL 16475-R10.01
MAGNOLIA	**HS**	400		FIN			63x44	R-30	FL 16476-R6.1
MAGNOLIA	**HS**	400		FIN			72x60	R-15	
MAGNOLIA	**HS**	4000		FINLESS			72x60	R-15	

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MAGNOLIA	**PW**	400		FIN			72x48	R-45	FL 16474-R7.3
MAGNOLIA	**PW**	4000		FINLESS			72x60	R-35	FL 16474-R7.8
MAGNOLIA	**PW**	400		FIN			72x60	R-35	FL 16474-R7.8
MAGNOLIA	**PW**	400		FIN			72x60	R-50	FL 16474-R7.1
MAGNOLIA	**PW**	400		FIN			48x84	R-35	FL 16474-R7.2
MAGNOLIA	**PW-PW**	400	TWIN	FIN			96x84	R-25	FL 16474-R7.7
MAGNOLIA	**PW-PW-PW**	400	TRIPLE	FIN			108x72	R-35	FL 16474-R7.4
MAGNOLIA	**PW-PW-PW**	400	TRIPLE	FIN			108x72	R-50	FL 16474-R7.6
MAGNOLIA	**PW-PW-PW**	4000	TRIPLE	FINLESS			108x84	R-20	FL 16474-R7.9
MAGNOLIA	**PW-PW-PW**	400	TRIPLE	FIN			108x84	R-20	FL 16474-R7.5
MAGNOLIA	**SGD XO**	800		FIN			73x97	LC-40	FL 47518.01
MAGNOLIA	**SGD XO**	800		FIN			97x97	LC-25	FL 47518.01
MAGNOLIA	**SGD XO**	800		FIN			72x80	LC-50	FL 47518.02
MAGNOLIA	**SGD XO**	800		FIN			96x80	LC-40	FL 47518.03
MAGNOLIA	**SGD XO**	800		FIN			96x96	LC-25	FL 47518.03
MAGNOLIA	**SGD OXO**	800		FIN			108x80	R-50	FL 47518.04
MAGNOLIA	**SGD OXO**	800		FIN			109x97	LC-40	FL 47518.05
MAGNOLIA	**SGD OXXO**	800		FIN			143x80	R-30	FL 47518.06

Installation Instructions for New Construction: Single Hung and Picture Windows

Inspect all windows carefully. DO NOT INSTALL if damaged or defective.

FIG. 1

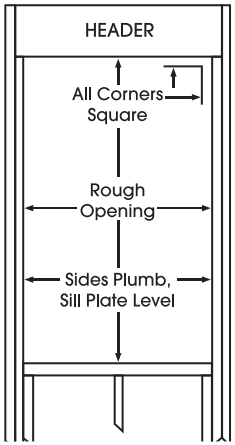
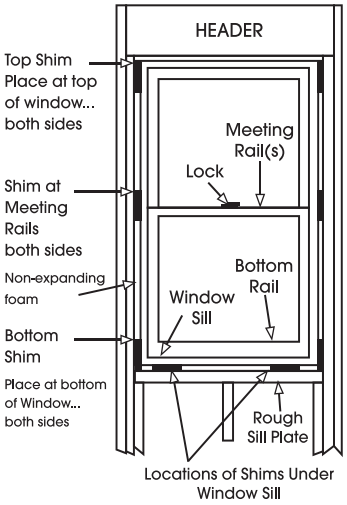


FIG. 2 INTERIOR VIEW



Window Opening
The rough opening must be plumb, level and square and slightly larger than window size in width and height, not including the nailing fins (see fig. 1). Close and lock the sash to aid in keeping the window square during installation. All packaging materials including wood support for bottom nailing fin, cardboard and aluminum shipping angles for mulled combinations need to be removed prior to installation of the window.

Apply a ⅜" continuous bead of Sealant caulking to the interior surface of the nailing fin covering the holes in the fin, to seal the window's fin to the sheathing or house wrap. If the rough opening is larger than the window unit by more than ½" also apply the caulk to the sheathing or house wrap, making sure the bead is no more than¼" from the edge of the rough opening, so that It Is covered by the nailing fin when the window is Installed.

Setting Shims (if necessary)
The sill of the window must be supported In a straight and level position at a minimum of three points, at either end and in the middle. Windows wider than 30" should be supported at a maximum of every 12" (see fig. 2). Shims should be used when applicable.

Placing Shims
Place¼" shims on the sill plate of the window opening spaced as described above. Multiple twin or triple windows should have a support under each mullion (see fig. 2).

Setting Window
Set window on the shims and adjust side clearance to be equal on both sides. Tack one upper comer of the fin to keep window in place. Check sill with a level and adjust thickness of shims as required to level sill. Readjust side clearance as necessary. Shims must be cut to exact thickness to fit snug and not fall out but do not force shims into place, pushing the sill upward out of level. Shim both sides of window (see fig. 2) and adjust thickness of shims to make diagonal measurements equal with the window plumb and square.

If the above has been done correctly the width across the top, middle and bottom will measure the same. Clearance between the sash stile and jamb main frame will be equal. The meeting rail and lock rail will align evenly at the top and clearance between the sash stile and Jamb mainframe will have parallel sight lines. The sweep latches should lock smoothly.

Fastening Windows with Nail Fins
Selection of fasteners are the responsibility of the installer. Structure and load requirement should be taken Into account with regard to selection. The windows shall be secured to the framing through the nail fin. Fasteners are corrosion resistant as specified in the International Building Code (IBC), International Residential Code (IRC) and the Texas Revisions. To achieve published test results #8-1 ½" truss head screw or equivalent should be used.

Fasteners shall be spaced approximately 2" from each corner and approximately 12" on center around the perimeter of the window. The fasteners shall be long enough to penetrate a minimum of 1-½" into the wall framing. Mulled or multiple window units must be fastened directly at the mull and approximately 6" on either side of the mullion. On mulled combination windows place a small piece of self-adhesive flexible flashing tape to seal the 1" void between nailing fins. Make sure head and sill are not bowed up or down. Check side jambs are not bowed in or out

Flashing Recommendations
Use self adhesive flexible flashing (minimum 4" wide and meets local requirements) which has a self-adhering surface on one side, approved for use on vinyl, aluminum and other substances such as house wrap. This flashing material must meet a minimum water resistance of 24 hours in accordance with ASTM-D779 and MMA Certified Installation Guidelines.

(see fig. 3) Sill flashing is applied first up against the bottom of the window sill extending beyond the sides of the window jamb fin and side flashing at least 2" Apply jamb flashing next over the jamb-nailing fin, continuing over and beyond the sill flashing, 2" below. Apply head flashing similarly, extending 2" past either side of the jamb flashing, to complete the window flashing detail.

(see fig.2) Install non-expanding foam or insulation between the window and rough opening. It is very important that these openings are not overstuffed and bow the frame. Do NOT use expanding foam.

FIG. 3 EXTERIOR VIEW

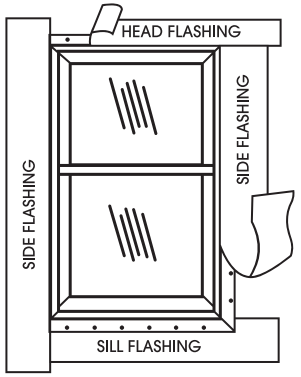
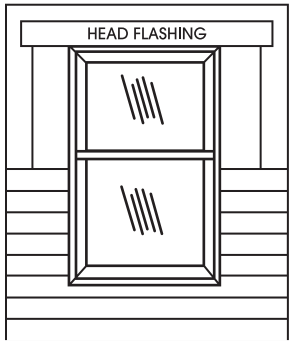


FIG. 4 EXTERIOR VIEW



CAUTIONS

Do not use large razor knives, metal scrapers or razor blades to clean glass. Never scrape dry glass!
Do not remove shipping clips from lock rail until window is installed.
Do not lay windows flat or store in sun. The heat will shrink the plastic wrapping and ward the frame.
Do not caulk or plug weep holes.
Do not drill into or through the sill of the window.
Protect the window during construction and plastering.
Do not lift window by top of frame, only by jambs.
Protect vinyl sill from traffic and damage.

These recommended guidelines are based on Industry accepted practices, however there are other accepted methods. Knowing, understanding and satisfying local code requirements is the sole responsibility of the installer.

Check with local building codes for particular installation and performance requirements.

For updated information on approvals and/or Installation guidelines, go to

WestlakeRoyalWindows.com

Molimo™
Architectural Product Testing

TEST REPORT

AAMA/WDMA/CSA 101/I.S.2/A440-11
AAMA/WDMA/CSA 101/I.S.2/A440-08
CSA A440S1-09

REPORT NO.: 2179.04-109-12-R1

RENDERED TO: KRESTMARK INDUSTRIES, L.P. (WESTLAKE ROYAL WINDOWS)
Dallas, Texas

PRODUCT TYPE: PVC Patio Door, Type XO

SERIES / MODEL: 800

Test	Specimen #1 Summary of Results *With 5/32" Tempered IG	Specimen #2 Summary of Results *With 5/32" Tempered IG
Primary Product Designator	Class LC-PG25 2426 x 2426 (96 x 96) - SD	Class LC-PG40 2426 x 2032* (96 x 80*) - SD
Design Pressure	±1200 Pa (±25.06 psf)	±1920 Pa (±40.10 psf)
Air Infiltration	0.5 L/s/m^2 (0.10 cfm/ft^2)	*See Specimen #1*
Canadian Air Infiltration/Exfiltration Level	A3	*See Specimen #1*
Water Penetration Resistance Test Pressure	360 Pa (7.52 psf)	*See Specimen #1*

Test	Specimen #3 Summary of Results *With 1/8" Tempered IG
Primary Product Designator	Class LC-PG50 1816 x 2032* (72 x 80*) - SD
Design Pressure	±2400 Pa (±50.13 psf)
Air Infiltration	0.8 L/s/m^2 (0.16 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level	A2
Water Penetration Resistance Test Pressure	360 Pa (7.52 psf)

Test Completion Date: 12/17/2019

Reference must be made to Report No. 2179.04-109-12-R1, dated 6/21/2024 for complete test specimen description and detailed test results.

CLIENT INFORMATION: KRESTMARK INDUSTRIES, L.P. (WESTLAKE ROYAL WINDOWS)
3950 Bastille Road, Suite 100
Dallas, Texas 75212

TEST LABORATORY: Molimo, LLC
1410 Eden Road
York, Pennsylvania 17402
717-900-6034

PROJECT SUMMARY:

PRODUCT TYPE: PVC Patio Door, Type XO

SERIES/MODEL: 800

PROJECT SUMMARY:

Molimo, LLC was contracted to perform testing on the above-referenced product. The results are tested values and were secured by using the designated test methods. A summary of the rating achieved for the specimen tested are shown in the table below. This product was originally tested by Veka, Inc. as Series PD12WW. This report is a reissue of Report No. 2179.01-109-12 in the name of Krestmark Industries, L.P. (Westlake Royal Windows) through written authorization of Veka, Inc.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-08 and -11 CSA A440S1-09	Class LC-PG25 2426 x 2426 (96 x 96) - SD
2	101/I.S.2/A440-08 and -11 CSA A440S1-09	Class LC-PG40 2426 x 2032* (96 x 80*) - SD
3	101/I.S.2/A440-08 and -11 CSA A440S1-09	Class LC-PG50 1816 x 2032* (72 x 80*) - SD

PROJECT DETAILS:

Test Dates: 12/3/2019 – 12/17/2019

Test Record Retention End Date: 12/17/2023

Test Location: VEKA, Inc. test facility in Fombell, PA. In accordance with AAMA 205.01, calibration of manufacturers' test equipment is documented under Report No. 2175.01-109-12.

Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Molimo for a minimum of four years from the test completion date.

Drawing Reference: The test specimen drawings were supplied by the client. The test specimen construction was verified by Molimo and was found to be representative of the product tested. Test specimen drawings are located in Appendix C of this report.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Doug Merry	VEKA, Inc.
Cornell Charles	VEKA, Inc.
Joseph Allison	Molimo, LLC

TEST METHODS:

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights

TEST SPECIMEN DESCRIPTION:

PRODUCT SIZES:

Test Specimen #1:

Overall Size:	2426 mm x 2426 mm (95-1/2" x 95-1/2")
Overall Area:	5.89 m^2 (63.34 ft^2)
Panel Size:	1229 mm x 2346 mm (48-3/8" x 92-3/8")
Screen Size:	1219 mm x 2371 mm (48" x 93-3/8")

Test Specimen #2:

Overall Size:	2426 mm x 2019 mm (95-1/2" x 79-1/2")
Overall Area:	4.90 m^2 (52.72 ft^2)
Panel Size:	1229 mm x 1940 mm (48-3/8" x 76-3/8")
Screen Size:	1219 mm x 1965 mm (48" x 77-3/8")

Test Specimen #3:

Overall Size:	1816 mm x 2019 mm (71-1/2" x 79-1/2")
Overall Area:	3.67 m^2 (39.47 ft^2)
Panel Size:	924 mm x 1940 mm (36-3/8" x 76-3/8")
Screen Size:	914 mm x 1965 mm (36" x 77-3/8")

TEST SPECIMEN DESCRIPTION: (Continued)

FRAME CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded
Fixed stile:	The fixed meeting stile was fastened to the head / sill with four #8 x 3" pan head screws, two at each end. Each intersection was sealed with silicone sealant.
Equal lites:	The equal lite adaptors were coped, snap-fit and sealed at each end.
Threshold Cap:	The threshold caps were coped and snap-fit
Roller track:	Drop-in extruded aluminum roller track

PANEL CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded

REINFORCEMENT:

Drawing Number	Material	Location
RFPD34SOM	Formed steel	Fixed meeting stile
RFPD03SOM	Formed steel	Lock stile
RFPD24SOM	Formed steel	Interlock stile

GLAZING DETAILS: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen can be made.*

TEST SPECIMEN DESCRIPTION: (Continued)

Description	Detail
Glass Type Specimen #1 & #2: Specimen #3:	 7/8" IG 1" IG
Glazing Construction (exterior to interior) Specimen #1 & #2:	5/32" thick tempered glass 9/16" box shaped aluminum spacer system 5/32" thick tempered glass
Glazing Construction (exterior to interior) Specimen #3:	1/8" thick tempered glass 3/4" box shaped aluminum spacer system 1/8" thick tempered glass
Glazing Method	Exterior glazed against a double-sided adhesive glazing tape and secured with rigid vinyl glazing beads
Glazing Bite	1/2"
Daylight Opening Specimen #1 (2): Specimen #2 (2): Specimen #3 (2):	 1111 mm x 2261 mm (43-3/4" x 87-3/4") 1111 mm x 1822 mm (43-3/4" x 71-3/4") 806 mm x 1822 mm (31-3/4" x 71-3/4")

WEATHERSTRIPPING:

Description	Quantity	Location
0.187” backed by 0.270" high center fin pile	2 Rows	Lock stile, top rail, bottom rail
0.187” backed by 0.270" high center fin pile	1 Row	Interlocking stile, fixed meeting stile interlock

TEST SPECIMEN DESCRIPTION: (Continued)

DRAINAGE:

Description	Quantity	Location
1" wide by 1/8" high weepslot	4	Exterior sill face, one 3" from each end, through two walls
1" wide by 3/16" high weepslot	2	Intermediate sill wall, (below glazing tower), one at each end
1" wide by 1/4" deep weep hole with 1-1/2" by 1" by 1/2" thick open cell foam baffle	2	Sill track, one at each end
1/2" wide by 1/8" high weepslot	4	Exterior sill face, one 1-1/2" from each end, draining the screen track
1-3/4" wide by 1/4" deep weep notch	2	Each end of aluminum roller track

HARDWARE:

Description	Quantity	Location
Handle/lock assembly with mortise lock	1	Lock stile with keeper on the jamb. Keeper mounted with two #8 x 3" fasteners through the jamb and into the wood buck. Mortise lock mounted to the stile with two #8 x 1-3/8" self-tapping fasteners.
Dual steel roller assembly	2	Bottom rail, one at each end
3" long molded rubber sash panel stop	1	Sill track at fixed side jamb

SCREEN CONSTRUCTION:

Frame Material:	Formed Aluminum
Mesh Type:	Fiber
Corner Construction:	Miter cut and secured with metal corner keys
Mesh Attachment Method:	Flexible vinyl spline

INSTALLATION: The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The integral nailing fin of the specimen was sealed with sealant.

TEST SPECIMEN DESCRIPTION: (Continued)

Location	Anchor Description	Anchor Spacing
Integral nail fin	#8 x 2" truss head screw	Spaced approximately 9" on center, and starting in each corner going through the fin and into the wood buck
Head / sill *(Specimen #2 only)*	#8 x 2-1/2" truss head screw	Three per head/sill, one located at 6" from each side of the fixed stile and one at midspan (6 total)
Keeper	#8 x 3" pan head screw	Two screws through the keeper and into the wood buck

TEST RESULTS: The temperature during testing was 19°C (67°F).

Specimen #1:

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	80 N (18 lbf)	135 N (30 lbf)
Maintain Motion (Opening)	44 N (10 lbf)	90 N (20 lbf)
Maintain Motion (Closing)	44 N (10 lbf)	90 N (20 lbf)
Locks / Latches	36 N (8 lbf)	100 N (22.5 lbf)

Note #1: The operating force results listed above represent the maximum force measured among all sash tested.

AIR LEAKAGE TESTING: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.5 L/s/m^2 (0.10 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	0.4 L/s/m^2 (0.10 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)

Canadian Air Infiltration Rating: A3

Note #2: The specimen tested meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

WATER PENETRATION TESTING: (ASTM E 547)

Test	Results	Allowable
360 Pa (7.52 psf)	Pass	No Leakage

Note #3: Water Penetration testing was performed with and without an insect screen.

TEST RESULTS: (Continued)

Specimen #1: (Continued)

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at mullion		
+1200 Pa (+25.06 psf)	30.0 mm (1.10")	
-1200 Pa (-25.06 psf)	29.0 mm (1.14")	Report Only

Structural Test	Results	Allowable
Permanent Set measured at mullion		
+1800 Pa (+37.59 psf)	1.0 mm (0.04")	9.3 mm (0.37")
-1800 Pa (-37.59 psf)	1.3 mm (0.05")	9.3 mm (0.37")

Note #4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note #5: All loads were held for 10 seconds.

Note #6: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

SECONDARY TESTING:

Test	Results	Allowable
FORCED ENTRY RESISTANCE per F 842		
Type: A – Grade: 10	Pass	No Entry
THERMOPLASTIC CORNER WELD	Pass	Meets as stated
DEGLAZING per ASTM E 987		
Operating Direction – 320 N (70 lbf)	Pass	Meets as stated
Remaining Direction – 230 N (50 lbf)	Pass	Meets as stated
INSECT SCREEN SERVICEABILITY TEST		
60 N (13.5 lbf)	Pass	Meets as stated

TEST RESULTS: (Continued)

Specimen #2:

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at mullion		
+1920 Pa (+40.10 psf)	23.0 mm (0.91")	
-1920 Pa (-40.10 psf)	22.0 mm (0.87")	Report Only

Structural Test	Results	Allowable
Permanent Set measured at mullion		
+2880 Pa (+60.15 psf)	1.3 mm (0.05")	7.9 mm (0.31")
-2880 Pa (-60.15 psf)	0.8 mm (0.03")	7.9 mm (0.31")

Note #7: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note #8: All loads were held for 10 seconds.

Note #9: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

Specimen #3:

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	67 N (15 lbf)	135 N (30 lbf)
Maintain Motion (Opening)	44 N (10 lbf)	90 N (20 lbf)
Maintain Motion (Closing)	44 N (10 lbf)	90 N (20 lbf)
Locks / Latches	36 N (8 lbf)	100 N (22.5 lbf)

Note #10: The operating force results listed above represent the maximum force measured among all sash tested.

TEST RESULTS: (Continued)

Specimen #3: (Continued)

AIR LEAKAGE TESTING: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.8 L/s/m^2 (0.16 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	0.7 L/s/m^2 (0.14 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)

Canadian Air Infiltration Rating: A2

Note #11: The specimen tested meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

WATER PENETRATION TESTING: (ASTM E 547)

Test	Results	Allowable
360 Pa (7.52 psf)	Pass	No Leakage

Note #12: Water Penetration testing was performed with and without an insect screen.

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at mullion		
+2400 Pa (+50.13 psf)	22.8 mm (0.90")	
-2400 Pa (-50.13 psf)	21.5 mm (0.85")	Report Only

Structural Test	Results	Allowable
Permanent Set measured at mullion		
+3600 Pa (+75.19 psf)	1.5 mm (0.10")	7.9 mm (0.31")
-3600 Pa (-75.19 psf)	1.0 mm (0.04")	7.9 mm (0.31")

Note #13: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note #14: All loads were held for 10 seconds.

Note #15: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

TEST RESULTS: (Continued)

Specimen #3: (Continued)

SECONDARY TESTING:

Test	Results	Allowable
FORCED ENTRY RESISTANCE per F 842 Type: A – Grade: 10	Pass	No Entry
THERMOPLASTIC CORNER WELD	Pass	Meets as stated
DEGLAZING per ASTM E 987		
Operating Direction – 320 N (70 lbf)	Pass	Meets as stated
Remaining Direction – 230 N (50 lbf)	Pass	Meets as stated
INSECT SCREEN SERVICEABILITY TEST 60 N (13.5 lbf)	Pass	Meets as stated

***General Note**: All testing was performed in accordance with reference test methods.*

This report is reissued in the name of Krestmark Industries, L.P. (Westlake Royal Windows) through written authorization from Veka, Inc. to whom the original report was rendered. The original Report Number is 2179.01-109-12. A copy of this report, detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Molimo, LLC for the entire test record retention period. At the end of this retention period, the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. This test 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 specimen(s) tested. This report may not be reproduced, except in full, without the written permission of Molimo, LLC.

For MOLIMO, LLC:

James P. Grippo
Project Manager

Joseph E. Allison
Regional Manager

JEA:dro/sld

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Alteration Addendum (1)
- Appendix-B: Air Seal Location (1)
- Appendix-C: Drawings (5)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	09/05/19		Original
1	06/21/24	1, 2	Corrected Krestmark address and Series/Model

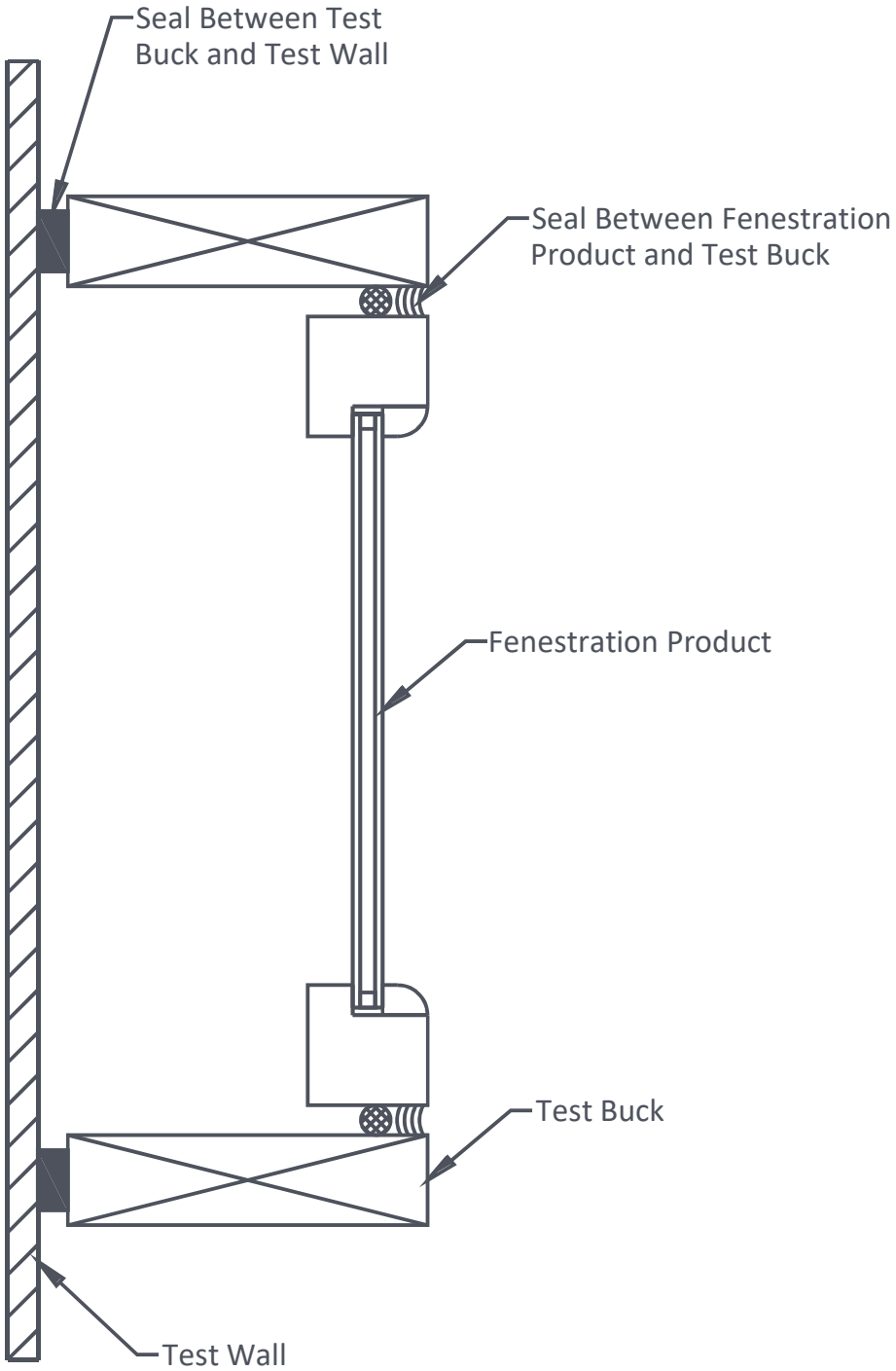
Appendix A

Alteration Addendum

No alterations were performed.

Appendix B

Air Seal Location



Appendix C

Drawings

BILL OF MATERIALS

PATIO DOOR
(PD12/17WW)

Molimo Architectural Product Testing
Report #: 2179.01-109-12
Date: 1/7/2020
By: J. Allison

NOTE: THIS BILL OF MATERIALS REFLECTS THE SYSTEM AS TESTED. DEVIATION FROM THE BILL OF MATERIALS IS NOT RECOMMENDED BY VEKA INC. AND MAY REDUCE THE PERFORMANCE OF THE FINISHED PRODUCT.

PVC PROFILES:	PART #	# PER UNIT	SOURCE
MASTER FRAME	PD1201/PD1701	4	VEKA
STILE/RAIL	PD25	3	VEKA
SASH INTERLOCK	PD24	1	VEKA
FIXED INTERLOCK	PD34	1	VEKA
EQUAL GLASS ADAPTOR	PD39	2	VEKA
GLAZING BEAD 1" GLASS	BV22	8	VEKA
7/8" GLASS	BV37	8	VEKA
3/4" GLASS	BV38	8	VEKA
THRESHOLD	PD33	1	VEKA
SCREEN TRACK	PD58	1	VEKA
ALUMINUM PROFILES:			
SILL TRACK	PD22	1	VEKA
REINFORCING PROFILES:			
JAMB STILE (PD25)	RF PD03 SO M	1	VEKA
SASH INTERLOCK (PD24)	RF PD24 SO M	1	VEKA
FIXED INTERLOCK (PD34)	RF PD34 SO M	1	VEKA
EQUAL GLASS ADAPTER (PD39)	RF PD03 SO M	A/R	VEKA
INTERLOCKS (PD24/PD34)	RF PD12b SO M	OPT	LOCAL VENDOR
HARDWARE:			
HANDLE SET	657**	1	Amesbury Door Hardware
MULTI POINT LOCK (SS)	2817SS	1	Amesbury Door Hardware
MULTI POINT KEEPER (SS)	2447 SS	1	Amesbury Door Hardware
TANDEM ROLLER (SS)	1978-4000 SS	2	TRUTH
ACTIVE SASH STOP	Bumper	1	LAMATEK
GLAZING:			
GLAZING SHIM	3/16" X 1" X 1" AWT**	A/R	TREMCO
DOUBLE FACE GLAZING TAPE	1/16" X 1/2"	A/R	ARLON
	1/16" X 1/2"	A/R	NORTON
	1/16" X 1/2"	A/R	VENTURE
SILICONE SEALANT	NOVAFLEX**	A/R	NOVAGUARD
	5733	A/R	SCHNEE MOREHEAD
LIQUID BACK BEDDING SILICONE	SBC1M150	A/R	NOVAGUARD
	896	A/R	PECORA
	5733	A/R	SCHNEE MOREHEAD
	899	A/R	DOW CORNING

BILL OF MATERIALS

PATIO DOOR
(PD12/17WW)

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Report #: 2179.01-109-12
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WEATHERSTRIPPING:		PART #	# PER UNIT	SOURCE
ALL	.270-.187	FS7826-187 (WHITE)	A/R	SCHLEGEL
WEATHERPILE	.270-.187	3027W (WHITE)	A/R	ULTRAFAB
	.270-.187	47127-187 (GRAY)	A/R	AMESBURY

SCREWS: NOTE: All screws are zinc plated or stainless steel sheet metal type, unless otherwise noted.

ROLLER	#10 X ½" FHP (SS)	4	MERCHANT
FIXED MEETING STILE (XO/OX)	#8 X 2" THP	4	MERCHANTS
LOCK HANDLE*	#8-32X 1-7/8" PHP**	2	AMESBURY
MORTISE LOCK	#10 X 1-1/4" FHP (SS)	2	AMESBURY
KEEPER	#10 X 1-1/4" PHP (SS)	4	AMESBURY

THREE LIGHT ADDITiON (OXO)

PVC PROFILES:

ASTRAGAL	PD32	1	VEKA
TRACK COVER	AC16	3	VEKA

REINFORCING PROFILES:

ASTRAGAL (PD32)	RF PD35 SO M	1	VEKA
	RF PD32 SO M	1	VEKA

SCREWS:

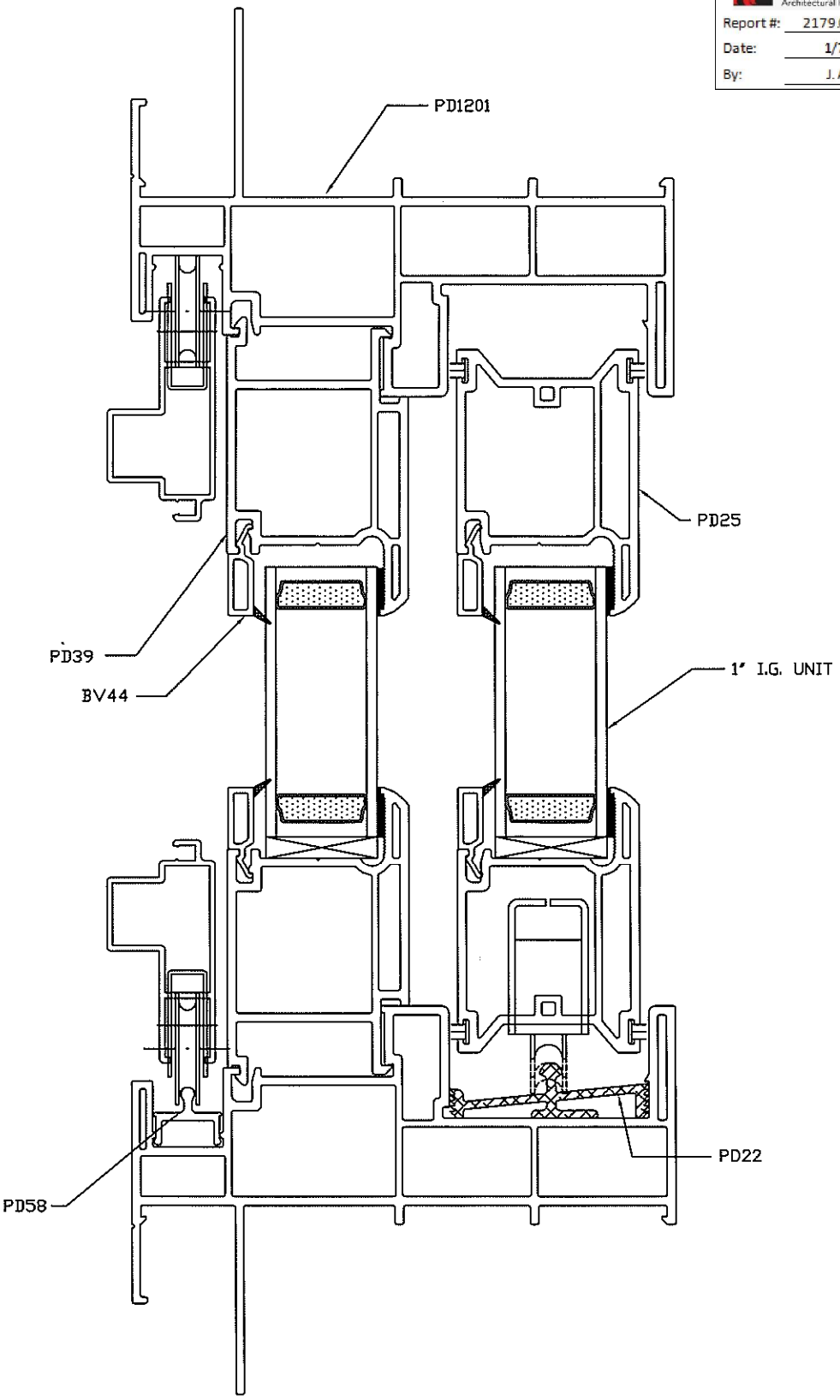
ASTRAGAL (PD32)	#8 X 3" FHP W/5/8" WASHERS	8	MERCHANTS
FIXED MEETING STILE (PD34)	#8 X 3" FHP W/5/8" WASHERS	4	MERCHANTS

* = HARDWARE SET INCLUDES SCREWS
** = COLOR
A/R = AS REQUIRED

02/17/06
Rev.09/26/2016

Molimo
Architectural Product Testing

Report #: 2179.01-109-12
Date: 1/7/2020
By: J. Allison



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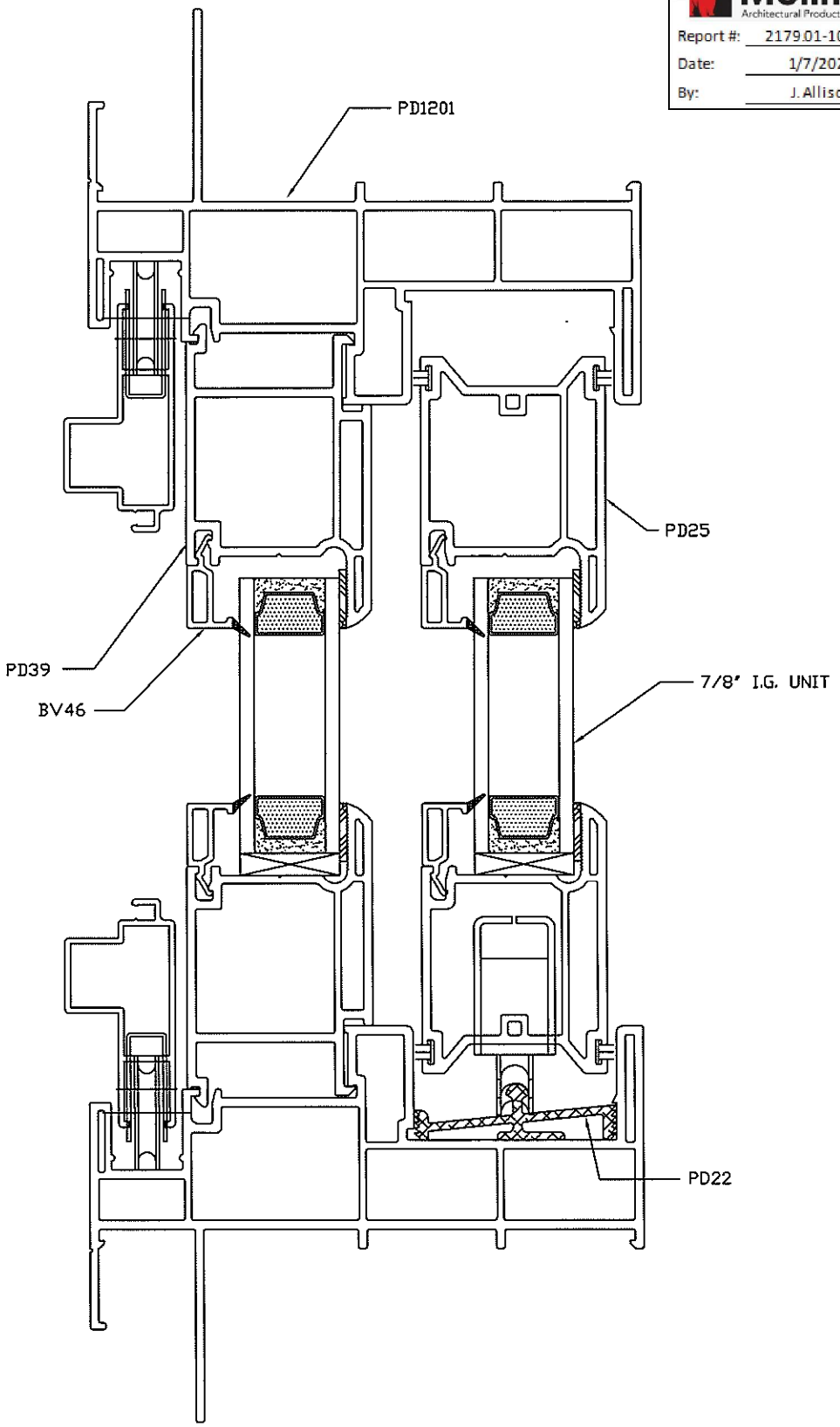
	REVISIONS	DATE

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: BJF	DATE: 06 MAY 2019	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW VERTICAL LAYOUT, EQUAL GLASS		DWG. # PD12WW-BV44

Molimo
Architectural Product Testing

Report #: 2179.01-109-12
Date: 1/7/2020
By: J. Allison

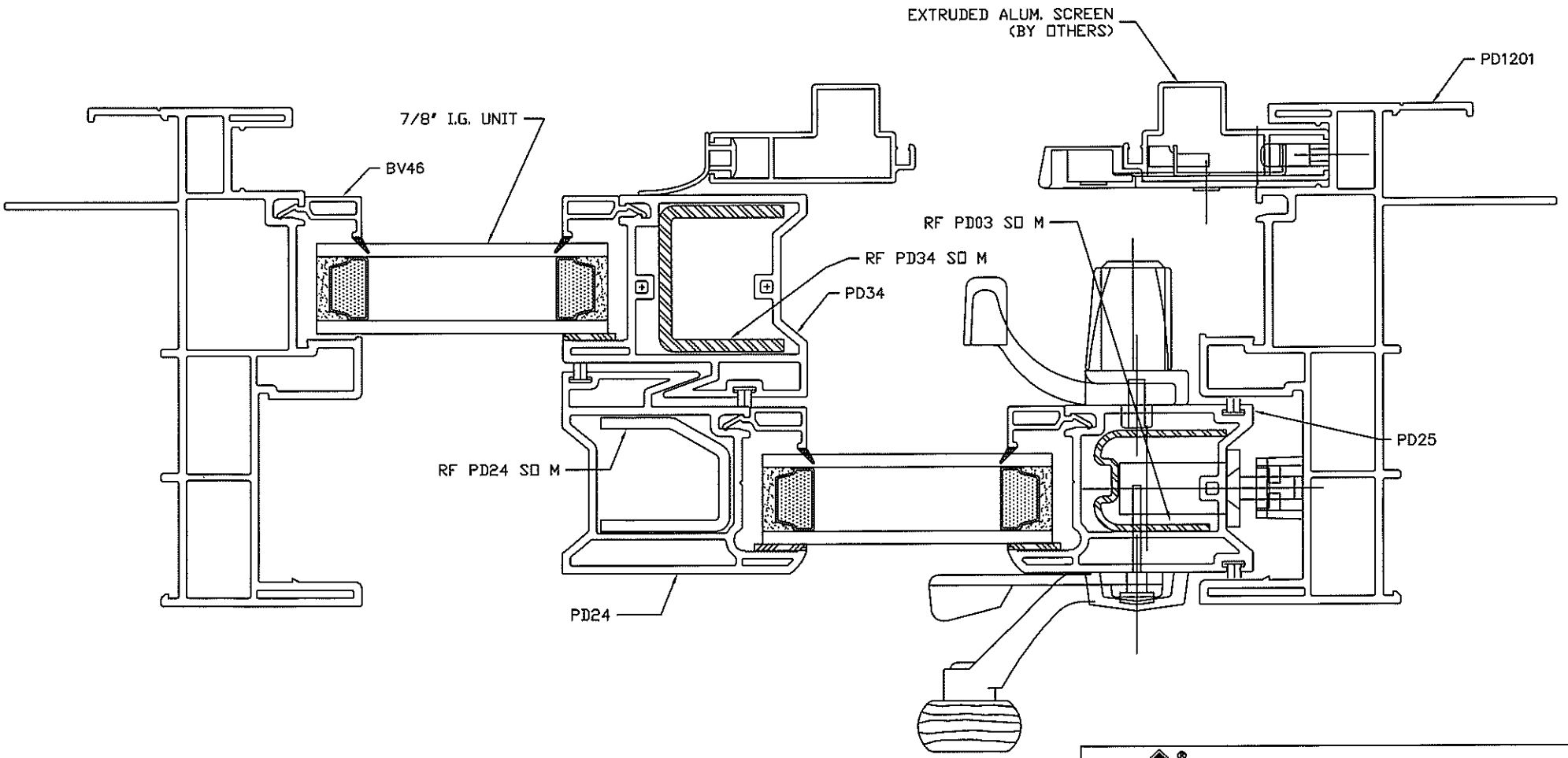


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VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

	REVISIONS	DATE

DRAWN: JLB	DATE: 2 DEC 03	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW, 7/8" I.G. VERTICAL LAYOUT, EQUAL GLASS		DWG. # PD12-78



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Molimo Architectural Product Testing

Report #: 2179.01-109-12

Date: 1/7/2020

By: J.Allison

	REVISIONS	DATE
1	UPDATED PD24 PROFILE	4/16/08

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: JLB	DATE: 2 DEC 03	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW, 7/8" I.G. HORIZONTAL LAYOUT, OX DOOR		DWG. # PD12-78

TEST REPORT

AAMA/WDMA/CSA 101/I.S.2/A440-11
AAMA/WDMA/CSA 101/I.S.2/A440-08

REPORT NO.: 2067.03-109-12-R1

RENDERED TO: KRESTMARK INDUSTRIES, L.P. (WESTLAKE ROYAL WINDOWS)
Dallas, Texas

PRODUCT TYPE: PVC Patio Door, Type OXO

SERIES / MODEL: 800

Test	Summary of Results
Primary Product Designator	Class LC-PG40 2769 x 2457 (109 x 97) - SD
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration	0.6 L/s/m^2 (0.11 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level	A2
Water Penetration Resistance Test Pressure	330 Pa (6.90 psf)

Test Completion Date: 8/21/2019

Reference must be made to Report No. 2067.03-109-12-R1, dated 6/21/2024 for complete test specimen description and detailed test results.

CLIENT INFORMATION: A WINDOW INC. DBA AMERICAN WINDOW SYSTEMS
3950 Bastille Road, Suite 100
Dallas, Texas 75212

TEST LABORATORY: Molimo, LLC
1140 Lincoln Avenue
Springdale, Pennsylvania 15144
724-410-7324

PROJECT SUMMARY:

PRODUCT TYPE: PVC Patio Door, Type OXO

SERIES/MODEL: 800

PROJECT SUMMARY:

Molimo, LLC was contracted to perform testing on the above referenced product. The results are tested values and were secured by using the designated test methods. A summary of the rating achieved for the specimen tested are shown in the table below.

This product was originally tested by Veka, Inc. as Series PD12 WW, PVC Patio Door, Type OXO. This report is a reissue of Report No. 2067.01-109-12 in the name of Krestmark Industries, L.P. (Westlake Royal Windows) through written authorization by Veka, Inc.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-08 and -11	Class LC-PG40 2769 x 2457 (109 x 97) - SD

PROJECT DETAILS:

Test Dates: 8/20/2019 – 8/21/2019

Test Record Retention End Date: 8/21/2023

Test Location: VEKA, Inc. test facility in Fombell, PA. In accordance with AAMA 205.01, calibration of manufacturers' test equipment is documented under Report No. 2065.01-109-12.

Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Molimo for a minimum of four years from the test completion date.

Drawing Reference: The test specimen drawings were supplied by the client. The test specimen construction was verified by Molimo and was found to be representative of the product tested. Test specimen drawings are located in Appendix C of this report.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Doug Merry	VEKA, Inc.
Cornell Charles	VEKA, Inc.
Joseph Allison	Molimo, LLC

TEST METHODS:

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

TEST SPECIMEN DESCRIPTION:

PRODUCT SIZES:

Test Specimen #1:

Overall Size:	2769 mm x 2457 mm (109" x 96-3/4")
Overall Area:	6.80 m^2 (73.23 ft^2)
Panel Size:	953 mm x 2381 mm (37-1/2" x 93-3/4")
Screen Size:	940 mm x 2407 mm (37" x 94-3/4")

FRAME CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded
Fixed stile:	The fixed meeting stile was fastened to the head / sill with four #8 x 3" pan head screws, two at each end. Each intersection was sealed with silicone sealant.
Mullion:	The mullion was fastened to the head / sill with eight #8 x 3" pan head screws, four at each end. Each intersection was sealed with silicone sealant.
Equal lites:	The equal lite adaptors were coped and snap-fit.
Threshold Cap:	The threshold caps were coped and snap-fit
Roller track:	Drop-in extruded aluminum roller track

PANEL CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded

TEST SPECIMEN DESCRIPTION: (Continued)

REINFORCEMENT:

Drawing Number	Material	Location
RFPD34SOM	Formed steel	Fixed meeting stile
RFPD03SOM	Formed steel	Lock stile
RFPD24SOM	Formed steel	Interlock stile
RFPD32SOM	Formed steel	Mullion

GLAZING DETAILS: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen can be made.*

Description	Detail
Glass Type	7/8" IG
Glazing Construction (exterior to interior)	5/32" thick tempered glass 18/32" silicone foam spacer 5/32" thick tempered glass
Glazing Method	Exterior glazed against a double-sided adhesive glazing tape and secured with rigid vinyl glazing beads
Glazing Bite	1/2"
Daylight Opening Panel: Fixed Lites (2):	 832 mm x 2261 mm (32-3/4" x 89") 838 mm x 2261 mm (33” x 89")

WEATHERSTRIPPING:

Description	Quantity	Location
0.187" backed by 0.270" high center fin pile	2 Rows	Lock stile, top rail, bottom rail
0.187" backed by 0.270" high center fin pile	1 Row	Interlocking stile, fixed meeting stile interlock

TEST SPECIMEN DESCRIPTION: (Continued)

DRAINAGE:

Description	Quantity	Location
1” wide by 1/8" high weepslot	4	Exterior sill face, one 3" from each end, through two walls
1” wide by 3/16" high weepslot	2	Intermediate sill wall (below glazing tower), one at each end
1” wide by 1/4" deep weep hole with 1-1/2" by 1” by 1/2" thick open cell foam baffle	2	Sill track, one at each end
1/2" wide by 1/8" high weepslot	4	Exterior sill face, one 1-1/2" from each end, draining the screen track
1-3/4" wide by 1/4" deep weep notch	2	Each end of aluminum roller track

HARDWARE:

Description	Quantity	Location
Handle/lock assembly with mortise lock	1	Lock stile with keeper on the mating mullion (keeper mounted with four #8 x 1" screws mounted into steel mullion reinforcement)
Dual steel roller assembly	2	Bottom rail, one at each end
3" long molded rubber sash panel stop	2	Sill track at each jamb

SCREEN CONSTRUCTION:

Frame Material:	Formed Aluminum
Mesh Type:	Fiber
Corner Construction:	Miter cut and secured with metal corner keys
Mesh Attachment Method:	Flexible vinyl spline

INSTALLATION: The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The exterior perimeter of the specimen was sealed with sealant.

TEST SPECIMEN DESCRIPTION: (Continued)

Location	Anchor Description	Anchor Spacing
Integral nail fin	#8 x 2" truss head screw	Spaced approximately 9" on center, and starting in each corner going through the fin and into the wood buck
Head / sill	#8 x 2-1/2" truss head screw	Five per head/sill, located 6" from each side of each mullion/fixed stile and one at midspan (10 total)
Jambs	#8 x 2-1/2" truss head screw	One located at midspan of each jamb (2 total)

TEST RESULTS: The temperature during testing was 19°C (67°F).

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	62 N (14 lbf)	135 N (30 lbf)
Maintain Motion (Opening)	53 N (12 lbf)	90 N (20 lbf)
Maintain Motion (Closing)	53 N (12 lbf)	90 N (20 lbf)
Locks / Latches	44 N (10 lbf)	100 N (22.5 lbf)

Note #1: The operating force results listed above represent the maximum force measured among all sash tested.

AIR LEAKAGE TESTING: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.6 L/s/m^2 (0.11 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	0.6 L/s/m^2 (0.11 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)

Canadian Air Infiltration Rating: A2

Note #2: The specimen tested meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

TEST RESULTS: (Continued)

WATER PENETRATION TESTING: (ASTM E 547)

Test	Results	Allowable
330 Pa (6.90 psf)	Pass	No Leakage

Note #3: Water Penetration testing was performed with and without an insect screen.

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at mullion +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	 35.5 mm (1.40") 42.0 mm (1.65")	 Report Only

Structural Test	Results	Allowable
Permanent Set measured at mullion +2880 Pa (+60.16 psf) -2880 Pa (-60.15 psf)	 1.3 mm (0.05") 6.0 mm (0.24")	 9.7 mm (0.38") 9.7 mm (0.38")

Note #4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note #5: All loads were held for 10 seconds.

Note #6: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

SECONDARY TESTING:

Test	Results	Allowable
FORCED ENTRY RESISTANCE per F 842 Type: B – Grade: 10	 Pass	 No Entry
THERMOPLASTIC CORNER WELD	Pass	Meets as stated
DEGLAZING per ASTM E 987 Operating Direction – 320 N (70 lbf) Remaining Direction – 230 N (50 lbf)	 Pass Pass	 Meets as stated Meets as stated

***General Note**: All testing was performed in accordance with reference test methods.*

This report is reissued in the name of Krestmark Industries, L.P. (Westlake Royal Windows) through written authorization from Veka, Inc. to whom the original report was rendered. The original Report Number is 2067.01-109-12. A copy of this report, detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Molimo, LLC for the entire test record retention period. At the end of this retention period, the service life of this report will expire.

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For MOLIMO, LLC:

James P. Grippo
Project Manager

Joseph E. Allison
Regional Manager

JEA:dro/sld

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- Appendix-B: Air Seal Location (1)
- Appendix-C: Drawings (4)

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1	06/21/24	1, 2	Corrected Krestmark address and Series/Model

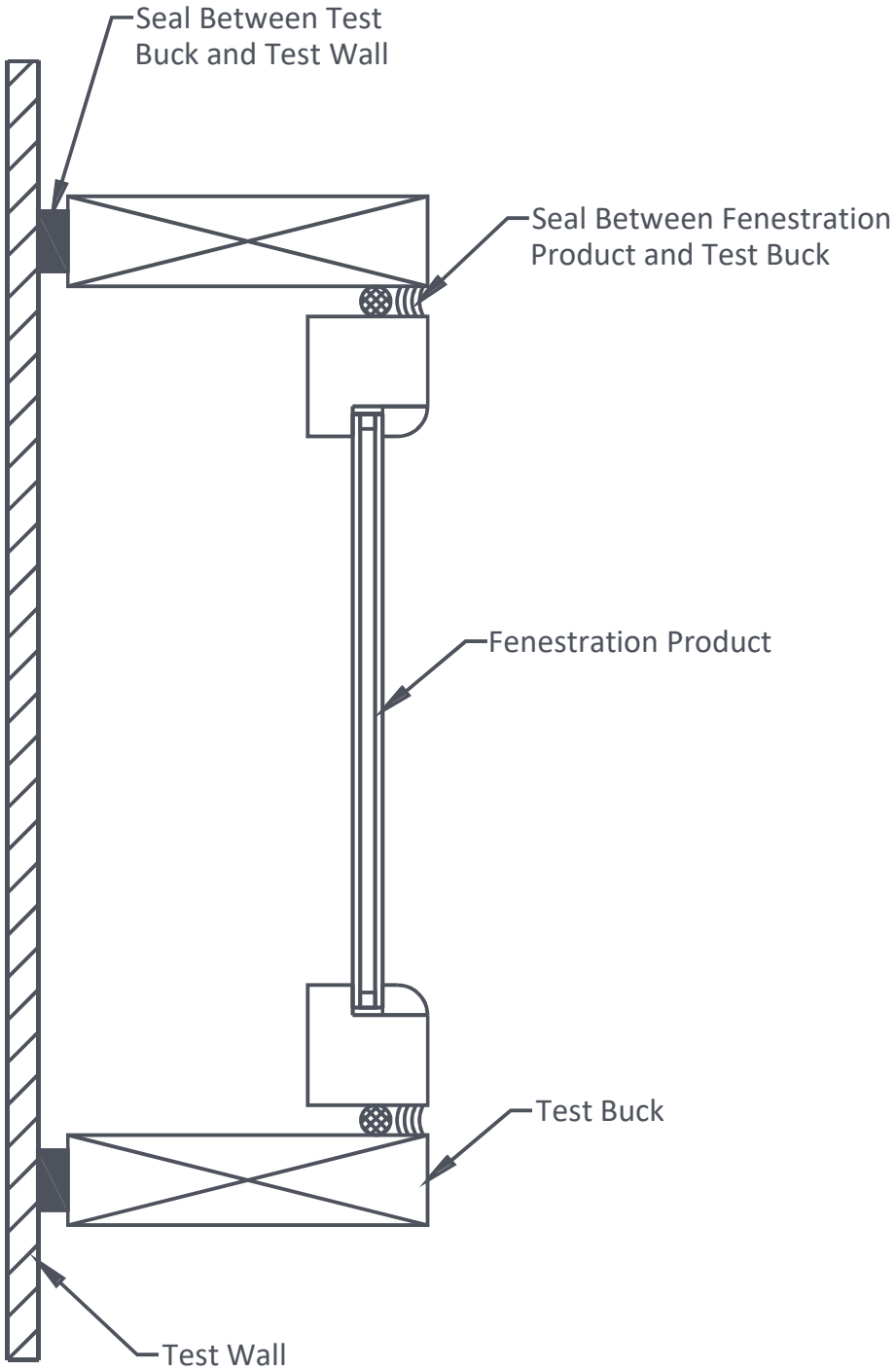
Appendix A

Alteration Addendum

No alterations were performed.

Appendix B

Air Seal Location



Appendix C

Drawings

BILL OF MATERIALS

PATIO DOOR
(PD12/17WW)

Molimo Architectural Product Testing
Report #: 2067.01-109-12
Date: 8/30/2019
By: J. Allison

NOTE: THIS BILL OF MATERIALS REFLECTS THE SYSTEM AS TESTED. DEVIATION FROM THE BILL OF MATERIALS IS NOT RECOMMENDED BY VEKA INC. AND MAY REDUCE THE PERFORMANCE OF THE FINISHED PRODUCT.

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MASTER FRAME	PD1201/PD1701	4	VEKA
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SASH INTERLOCK	PD24	1	VEKA
FIXED INTERLOCK	PD34	1	VEKA
EQUAL GLASS ADAPTOR	PD39	2	VEKA
GLAZING BEAD 1" GLASS	BV22	8	VEKA
7/8" GLASS	BV37	8	VEKA
3/4" GLASS	BV38	8	VEKA
THRESHOLD	PD33	1	VEKA
SCREEN TRACK	PD58	1	VEKA
ALUMINUM PROFILES:			
SILL TRACK	PD22	1	VEKA
REINFORCING PROFILES:			
JAMB STILE (PD25)	RF PD03 SO M	1	VEKA
SASH INTERLOCK (PD24)	RF PD24 SO M	1	VEKA
FIXED INTERLOCK (PD34)	RF PD34 SO M	1	VEKA
EQUAL GLASS ADAPTER (PD39)	RF PD03 SO M	A/R	VEKA
INTERLOCKS (PD24/PD34)	RF PD12b SO M	OPT	LOCAL VENDOR
HARDWARE:			
HANDLE SET	657**	1	Amesbury Door Hardware
MULTI POINT LOCK (SS)	2817SS	1	Amesbury Door Hardware
MULTI POINT KEEPER (SS)	2447 SS	1	Amesbury Door Hardware
TANDEM ROLLER (SS)	1978-4000 SS	2	TRUTH
ACTIVE SASH STOP	Bumper	1	LAMATEK
GLAZING:			
GLAZING SHIM	3/16" X 1" X 1" AWT**	A/R	TREMCO
DOUBLE FACE GLAZING TAPE	1/16" X 1/2"	A/R	ARLON
	1/16" X 1/2"	A/R	NORTON
	1/16" X 1/2"	A/R	VENTURE
SILICONE SEALANT	NOVAFLEX**	A/R	NOVAGUARD
	5733	A/R	SCHNEE MOREHEAD
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	899	A/R	DOW CORNING

BILL OF MATERIALS

PATIO DOOR
(PD12/17WW)

Molimo Architectural Product Testing
Report #: 2067.01-109-12
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WEATHERSTRIPPING:		PART #	# PER UNIT	SOURCE
ALL	.270-.187	FS7826-187 (WHITE)	A/R	SCHLEGEL
WEATHERPILE	.270-.187	3027W (WHITE)	A/R	ULTRAFAB
	.270-.187	47127-187 (GRAY)	A/R	AMESBURY

SCREWS: NOTE: All screws are zinc plated or stainless steel sheet metal type, unless otherwise noted.

ROLLER	#10 X ½" FHP (SS)	4	MERCHANT
FIXED MEETING STILE (XO/OX)	#8 X 2" THP	4	MERCHANTS
LOCK HANDLE*	#8-32X 1-7/8" PHP**	2	AMESBURY
MORTISE LOCK	#10 X 1-1/4" FHP (SS)	2	AMESBURY
KEEPER	#10 X 1-1/4" PHP (SS)	4	AMESBURY

THREE LIGHT ADDITiON (OXO)

PVC PROFILES:

ASTRAGAL	PD32	1	VEKA
TRACK COVER	AC16	3	VEKA

REINFORCING PROFILES:

ASTRAGAL (PD32)	RF PD35 SO M	1	VEKA
	RF PD32 SO M	1	VEKA

SCREWS:

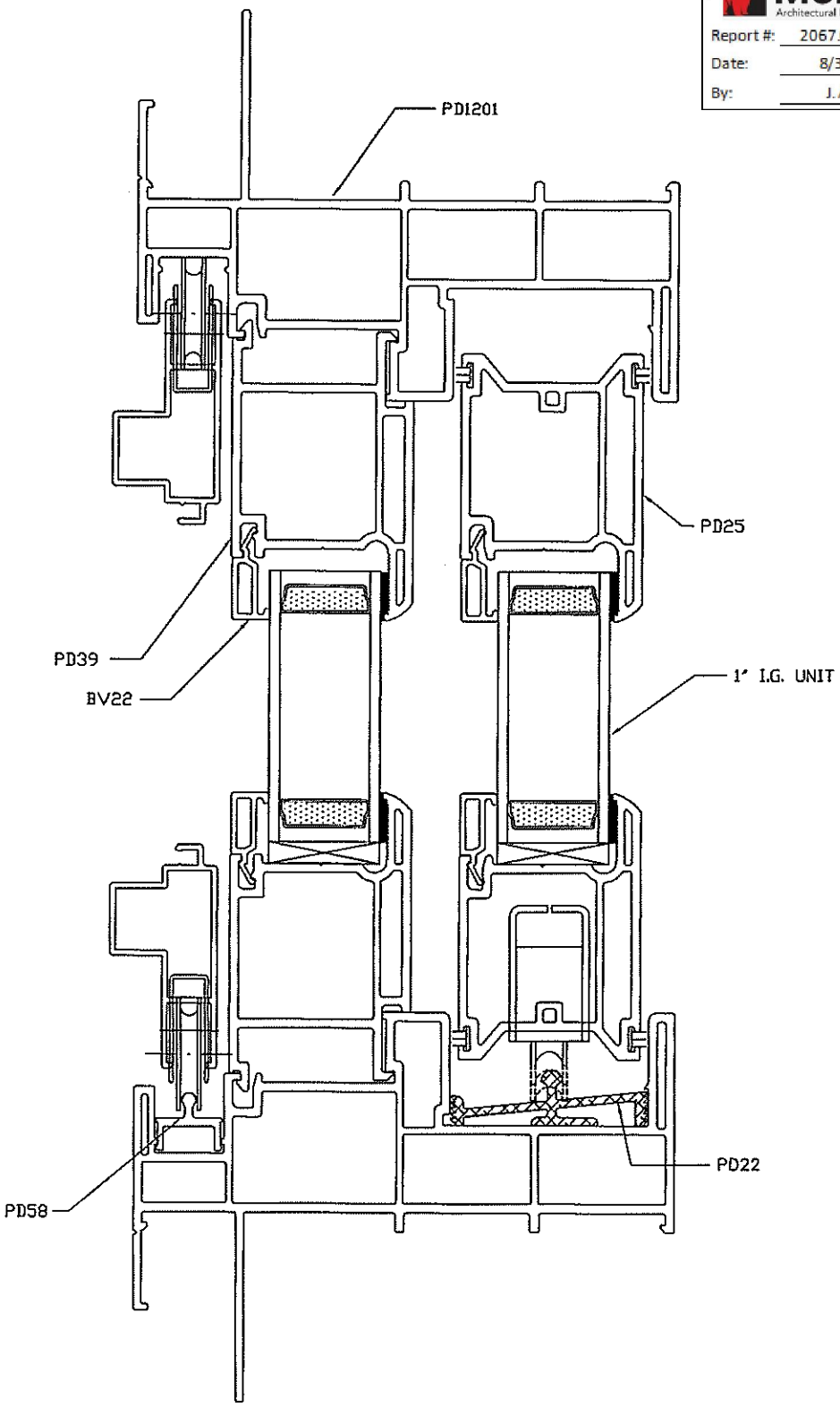
ASTRAGAL (PD32)	#8 X 3" FHP W/5/8" WASHERS	8	MERCHANTS
FIXED MEETING STILE (PD34)	#8 X 3" FHP W/5/8" WASHERS	4	MERCHANTS

* = HARDWARE SET INCLUDES SCREWS
** = COLOR
A/R = AS REQUIRED

02/17/06
Rev.09/26/2016

Molimo
Architectural Product Testing

Report #:	2067.01-109-12
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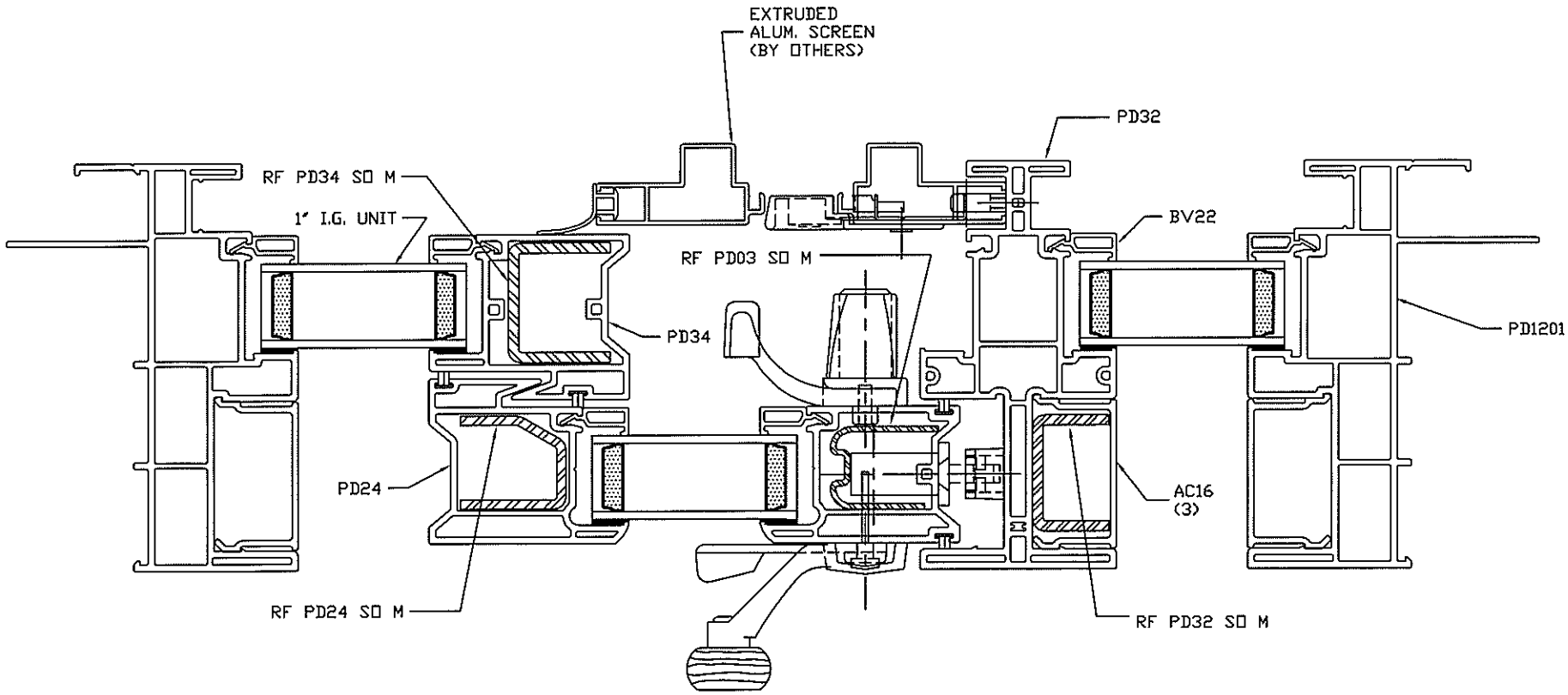


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	REVISIONS	DATE

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: JLB	DATE: 30 JULY 02	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW VERTICAL LAYOUT, EQUAL GLASS		DWG. # PD12WW



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Molimo Architectural Product Testing

Report #: 2067.01-109-12

Date: 8/30/2019

By: J. Allison

	REVISIONS	DATE
1	UPDATED PD24 PROFILE	4/16/08

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: JLB	DATE: 30 JULY 02	SCALE: 3/4X
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW HORIZONTAL LAYOUT, OXO DOOR		DWG. # PD12WW

TEST REPORT

AAMA/WDMA/CSA 101/I.S.2/A440-11
AAMA/WDMA/CSA 101/I.S.2/A440-08

REPORT NO.: 2498.06-109-12-R1

RENDERED TO: KRESTMARK INDUSTRIES, L.P. (WESTLAKE ROYAL WINDOWS)
Dallas, Texas

PRODUCT TYPE: PVC Patio Door, Type OXXO

SERIES / MODEL: 800

Test	Specimen #1 Summary of Results
Primary Product Designator	Class R-PG30 3620 x 2019 (143 x 80) - SD
Design Pressure	±1920 Pa (±40.10 psf)
Air Infiltration	0.5 L/s/m^2 (0.10 cfm/ft^2)
Canadian Air Infiltration/Exfiltration Level	A3
Water Penetration Resistance Test Pressure	220 Pa (4.60 psf)

Test Completion Date: 8/7/2020

Reference must be made to Report No. 2498.06-109-12-R1, dated 6/21/2024 for complete test specimen description and detailed test results.

CLIENT INFORMATION: KRESTMARK INDUSTRIES, L.P. (WESTLAKE ROYAL WINDOWS)
3950 Bastille Road, Suite 100
Dallas, Texas 75212

TEST LABORATORY: Molimo, LLC
1140 Lincoln Avenue
Springdale, Pennsylvania 15144
724-410-7324

PROJECT SUMMARY:

PRODUCT TYPE: PVC Patio Door, Type OXXO

SERIES/MODEL: 800

PROJECT SUMMARY:

Molimo, LLC was contracted to perform testing on the above-referenced product. The results are tested values and were secured by using the designated test methods. A summary of the rating achieved for the specimen tested is shown in the table below.

This product was originally tested by Veka, Inc. as the Series/Model PD12WW, PVC Patio Door, Type OXXO. This report is a reissue of Report No. 2498.01-109-12 in the name of Krestmark Industries, L.P. (Westlake Royal Windows) through written authorization by Veka, Inc.

SPECIMEN	SPECIFICATION	PRODUCT RATING
1	101/I.S.2/A440-08 and -11	Class R-PG30 3620 x 2019 (143 x 80) - SD

PROJECT DETAILS:

Test Dates: 8/6/2020 – 8/7/2020

Test Record Retention End Date: 8/7/2024

Test Location: Krestmark industries, L.P. (Westlake Royal Windows) test facility in Dallas, Texas. In accordance with AAMA 205.01, calibration of manufacturers' test equipment is documented under Report No. 2497.01-109-12.

Test Specimen Source: The test specimen was provided by the client. Representative samples of the test specimen will be retained by Molimo for a minimum of four years from the test completion date.

Drawing Reference: The test specimen drawings were supplied by the client. The test specimen construction was verified by Molimo and was found to be representative of the product tested. Test specimen drawings are located in Appendix C of this report.

WITNESSES:

The following representatives witnessed all or part of the testing.

Name	Company
Doug Merry	VEKA, Inc.
Cornell Charles	VEKA, Inc.
Joseph Allison	Molimo, LLC

TEST METHODS:

AAMA/WDMA/CSA 101/I.S.2/A440-11, *NAFS 2011 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

AAMA/WDMA/CSA 101/I.S.2/A440-08, *NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights*

CSA A440S1-09, Canadian Supplement to AAMA/WDMA/CSA 101/I.S.2/A440, NAFS - North American Fenestration Standard/Specification for Windows, Doors, and Skylights

TEST SPECIMEN DESCRIPTION:

PRODUCT SIZES:

Test Specimen #1:

Overall Size:	3620 mm x 2019 mm (142-1/2" x 79-1/2")
Overall Area:	7.31 m^2 (78.67 ft^2)
Panel Size (2):	822 mm x 1943 mm (32-3/8" x 76-1/2")
Screen Size (2):	914 mm x 1965 mm (36" x 77-3/8")

TEST SPECIMEN DESCRIPTION: (Continued)

FRAME CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded
Fixed Stiles:	The fixed meeting stiles were each fastened to the head/ sill with four #8 x 3" pan head screws, two at each end. Each intersection was sealed with silicone sealant.
Equal Lites:	The equal lite adaptors were coped, snap-fit and sealed at each end.
Threshold Cap:	The threshold caps were coped and snap-fit
Roller Track:	Drop-in extruded aluminum roller track

PANEL CONSTRUCTION:

Material:	Extruded PVC
Corner Details:	Miter cut and thermally welded
Astragal:	The astragal was attached to the left stile of the right-side operable panel with seven #10 x 3/4" pan head screws. Four #8 x 1-1/2" truss head screws were anchored through the keeper, astragal and into the panel stile.

REINFORCEMENT:

Drawing Number	Material	Location
RFPD34SOM	Formed steel	Fixed meeting stiles
RFPD03SOM	Formed steel	Lock stiles
RFPD24SOM	Formed steel	Interlock stiles
RFAM39SOM	Formed steel	Astragal

TEST SPECIMEN DESCRIPTION: (Continued)

GLAZING DETAILS: *No conclusions of any kind regarding the adequacy or inadequacy of the glass in any glazed test specimen can be made.*

Description	Detail
Glazing Construction (Exterior to Interior)	5/32" Thick tempered glass 11/16" Silicone foam spacer system 5/32" Thick tempered glass
Glazing Method	Exterior glazed against a double-sided adhesive glazing tape and secured with rigid vinyl glazing beads
Glazing Bite	1/2"
Daylight Opening Panel (2): Frame (2):	 822 mm x 1822 mm (32-3/8" x 71-3/4") 806 mm x 1822 mm (31-3/4" x 71-3/4")

WEATHERSTRIPPING:

Description	Quantity	Location
0.187" Backed by 0.270" high center fin pile	2 Rows	Lock stile, top rail, bottom rail
0.187" Backed by 0.270" high center fin pile	1 Row	Interlocking stile, fixed meeting stile interlock
1-1/4" wide by 3/4" tall by 0.270" high adhesive-backed pile pad	1	Sill track interior dam leg, placed where astragal and second panel meet

TEST SPECIMEN DESCRIPTION: (Continued)

DRAINAGE:

Description	Quantity	Location
1" wide by 1/8" high weep slot	4	Exterior sill face, one 3" from each end, through two walls
1" wide by 3/16" high weep slot	2	Intermediate sill wall, (below glazing tower), one at each end
1" wide by 1/4" deep weep hole with 1-1/2" by 1" by 1/2" thick open cell foam baffle	2	Sill track, one at each end
1/2" wide by 1/8" high weep slot	4	Exterior sill face, one 1-1/2" from each end, draining the screen track
1-3/4" wide by 1/4" deep weep notch	2	Each end of aluminum roller track

HARDWARE:

Description	Quantity	Location
Handle/lock assembly with dual mortise lock	1	Lock stile with keeper on the jamb. Keeper mounted with four #8 x 1-1/2" fasteners through the astragal, astragal reinforcement and into the panel. Dual mortise lock mounted to the stile with two #8 x 1-9/16" fasteners.
Dual steel roller assembly	4	Bottom rails, one at each end
3" Long molded rubber sash panel stop	2	Sill track at each jamb

SCREEN CONSTRUCTION:

Frame Material:	Formed Aluminum
Mesh Type:	Fiber
Corner Construction:	Miter cut and secured with metal corner keys
Mesh Attachment Method:	Flexible vinyl spline

TEST SPECIMEN DESCRIPTION: (Continued)

INSTALLATION: The specimen was installed into a Spruce-Pine-Fir wood buck. The rough opening allowed for a 1/8" shim space. The integral nailing fin of the specimen was sealed with sealant.

Location	Anchor Description	Anchor Spacing
Integral Nail Fin	#8 x 2" Truss head screw	Spaced approximately 8" on center, and starting in each corner going through the fin and into the wood buck
Sill	#8 x 2-1/2" Truss head screw	Three screws at the sill, one located at each set of interlocking stiles and one at midspan
Head	#8 x 2-1/2" Truss head screw	Six screws at the head, two located 6" apart at each set of interlocking stiles and at midspan

TEST RESULTS: The temperature during testing was 19° C (67° F).

OPERATING FORCE: (per ASTM E 2068)

Test	Results	Allowable
Initiate Motion	67 N (15 lbf)	135 N (30 lbf)
Maintain Motion (Opening)	53 N (12 lbf)	90 N (20 lbf)
Maintain Motion (Closing)	53 N (12 lbf)	90 N (20 lbf)
Locks / Latches	36 N (8 lbf)	100 N (22.5 lbf)

Note #1: The operating force results listed above represent the maximum force measured among all sash tested.

AIR LEAKAGE TESTING: (per ASTM E 283)

Test	Results	Allowable
Infiltration @ 75 Pa (1.57 psf)	0.5 L/s/m^2 (0.10 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)
Exfiltration @ 75 Pa (1.57 psf)	0.4 L/s/m^2 (0.08 cfm/ft^2)	1.5 L/s/m^2 (0.30 cfm/ft^2)

Canadian Air Infiltration Rating: A3

Note #2: The specimen tested meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.

WATER PENETRATION TESTING: (ASTM E 547)

Test	Results	Allowable
220 Pa (4.60 psf)	Pass	No Leakage

Note #3: Water Penetration testing was performed with and without an insect screen.

TEST RESULTS: (Continued)

UNIFORM LOAD TESTING: (per ASTM E 330)

Design Pressure Test	Results	Allowable
Deflection measured at the astragal +1920 Pa (+40.10 psf) -1920 Pa (-40.10 psf)	 10.3 mm (0.40") 9.0 mm (0.36")	 Report Only

Structural Test	Results	Allowable
Permanent Set measured at the astragal +2880 Pa (+60.15 psf) -2880 Pa (-60.15 psf)	 0.8 mm (0.03") 0.8 mm (0.03")	 7.6 mm (0.30") 7.6 mm (0.30")

Note #4: The deflections reported are not limited by AAMA/WDMA/CSA 101/I.S.2/A440 for this product designation and is recorded for information purposes only.

Note #5: All loads were held for 10 seconds.

Note #6: Tape and film were used to seal against air leakage. In our opinion, the tape and film did not influence the results of the test.

SECONDARY TESTING:

Test	Results	Allowable
FORCED ENTRY RESISTANCE per F 842 Type: C – Grade: 10	 Pass	 No Entry
THERMOPLASTIC CORNER WELD	Pass	Meets as stated
DEGLAZING per ASTM E 987 Operating Direction – 320 N (70 lbf) Remaining Direction – 230 N (50 lbf)	 Pass Pass	 Meets as stated Meets as stated

***General Note**: All testing was performed in accordance with reference test methods.*

This report is reissued in the name of *Krestmark Industries, L.P. (Westlake Royal Windows)* through written authorization from *Veka, Inc.* to whom the original report was rendered. The original *Veka, Inc.* Report Number is 2498.01-109-12. A copy of this report, detailed drawings, datasheets, representative samples of test specimens, or other pertinent project documentation will be retained by Molimo, LLC for the entire test record retention period. At the end of this retention period, the service life of this report will expire.

Results obtained are tested values and were secured by using the designated test methods. This test 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 specimen(s) tested. This report may not be reproduced, except in full, without the written permission of Molimo, LLC.

For MOLIMO, LLC:

James P. Grippo
Project Manager

Joseph Allison
Regional Manager

JEA:dro/sld

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Alteration Addendum (1)
- Appendix-B: Air Seal Location (1)
- Appendix-C: Drawings (4) Complete drawings packet on file with Molimo, LLC

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	09/05/19		Original
1	06/21/24	1, 2	Corrected Krestmark address and Series/Model

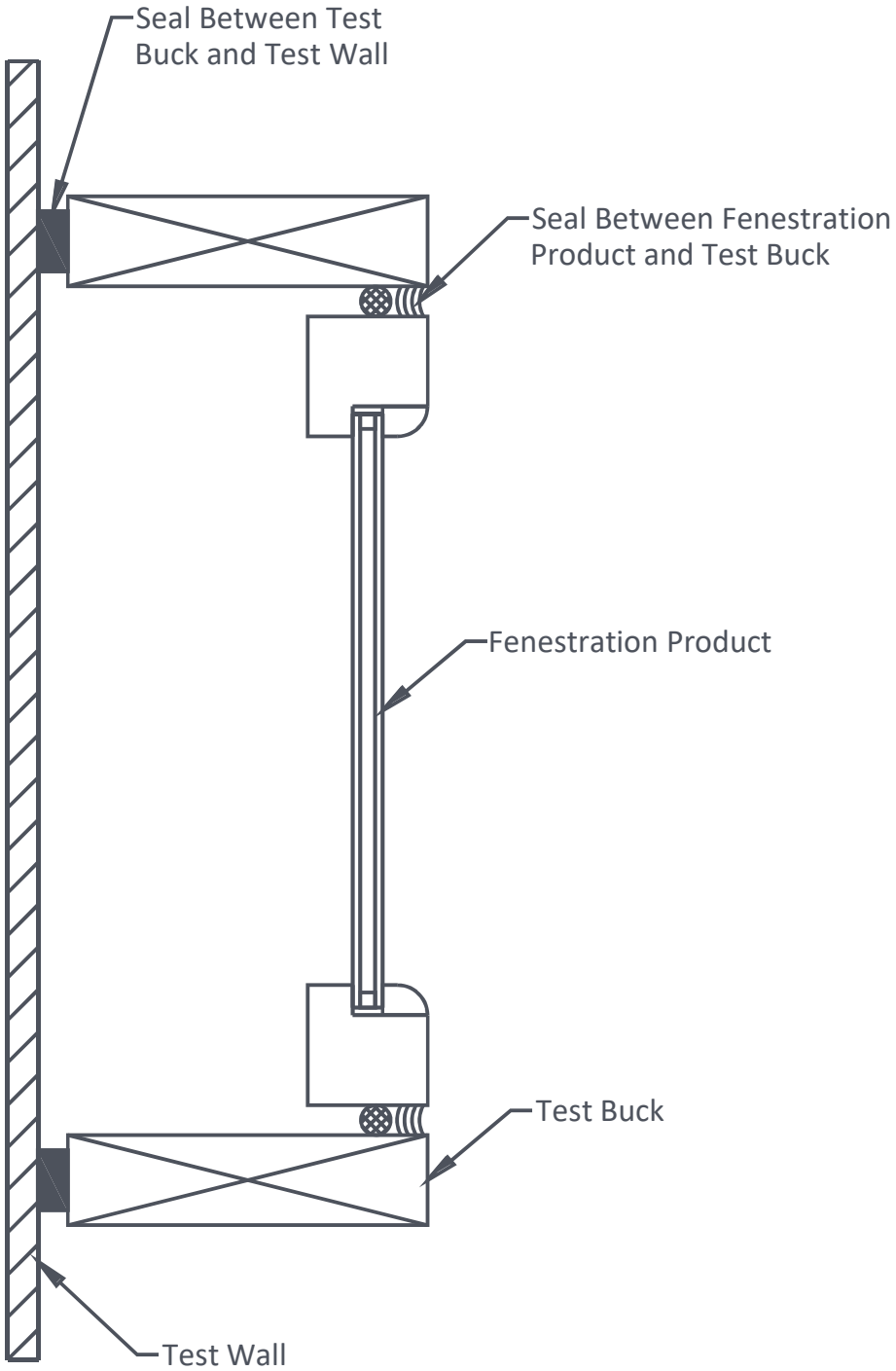
Appendix A

Alteration Addendum

No alterations were performed.

Appendix B

Air Seal Location



Appendix C

Drawings

Complete drawings packet is on file with Molimo, LLC.

BILL OF MATERIALS

PATIO DOOR
(PD12WW OXXO VERSION)

Molimo Architectural Product Testing
Report #: 2498.01-109-12
Date: 8/17/2020
By: J. Allison

NOTE: THIS BILL OF MATERIALS REFLECTS THE SYSTEM AS TESTED. DEVIATION FROM THE BILL OF MATERIALS IS NOT RECOMMENDED BY VEKA INC. AND MAY REDUCE THE PERFORMANCE OF THE FINISHED PRODUCT.

PVC PROFILES:	PART #	# PER UNIT	SOURCE
MASTER FRAME	PD1201	4	VEKA
STILE/RAIL	PD25	6	VEKA
SASH INTERLOCK	PD24	2	VEKA
FIXED INTERLOCK	PD34	2	VEKA
EQUAL GLASS ADAPTOR	PD39	4	VEKA
GLAZING BEAD 1" GLASS	BV22 /BV44	16	VEKA
7/8" GLASS	BV37	16	VEKA
3/4" GLASS	BV38	16	VEKA
THRESHOLD	PD33	1	VEKA
SCREEN TRACK	PD58	1	VEKA
ASTRAGAL	AM39	1	VEKA
ALUMINUM PROFILES:			
SILL TRACK	PD22	1	VEKA
ACTIVE SASH STOP	5207**	1	ATLANTIS PLASTICS
REINFORCING PROFILES:			
JAMB STILE (PD25)	RF PD03 SO M	2	VEKA
SASH INTERLOCK (PD24)	RF PD24 SO M	2	VEKA
FIXED INTERLOCK (PD34)	RF PD34 SO M	2	VEKA
ASTRAGAL (AM39)	RF AM39 SO M	1	VEKA
EQUAL GLASS ADAPTER (PD39) (8' DOORS)	RF PD03 SO M	A/R	VEKA
HARDWARE:			
HANDLE SET	657**	2	BSI/Door Hardware
MULTI POINT LOCK (SS)	2817 SS	1	BSI/Door Hardware
MULTI POINT KEEPER (SS)	2447 SS	1	BSI/Door Hardware
TANDEM ROLLER (SS)	1978-4000 SS	4	TRUTH
	2688-1250	4	BSI/Door Hardware

GLAZING:	PART #	# PER UNIT	SOURCE
GLAZING SHIM	3/16" X 1" X 1" AWT**	A/R	TREMCO
DOUBLE FACE GLAZING TAPE	1/16" X 1/2"	A/R	ARLON
	1/16" X 1/2"	A/R	NORTON
	1/16" X 1/2"	A/R	VENTURE
SILICONE SEALANT	NOVAFLEX**	A/R	NOVAGUARD
	5733	A/R	SCHNEE MOREHEAD
LIQUID BACK BEDDING SILICONE	SBC1M150	A/R	NOVAGUARD
	896	A/R	PECORA
	5733	A/R	SCHNEE MOREHEAD
	899	A/R	DOW CORNING

BILL OF MATERIALS

PATIO DOOR
(PD12WW OXXO VERSION)

Molimo Architectural Product Testing
Report #: 2498.01-109-12
Date: 8/17/2020
By: J. Allison

NOTE: THIS BILL OF MATERIALS REFLECTS THE SYSTEM AS TESTED. DEVIATION FROM THE BILL OF MATERIALS IS NOT RECOMMENDED BY VEKA INC. AND MAY REDUCE THE PERFORMANCE OF THE FINISHED PRODUCT.

WEATHERSTRIPPING:

ALL	.270-.187	FS7825-187 (WHITE)	A/R	SCHLEGEL
WEATHERPILE	.270-.187	3026W (WHITE)	A/R	ULTRAFAB
	.270-.187	47126-187 (GRAY)	A/R	AMESBURY

SCREWS:

NOTE: All screws are zinc plated or stainless steel sheet metal type, unless otherwise noted.

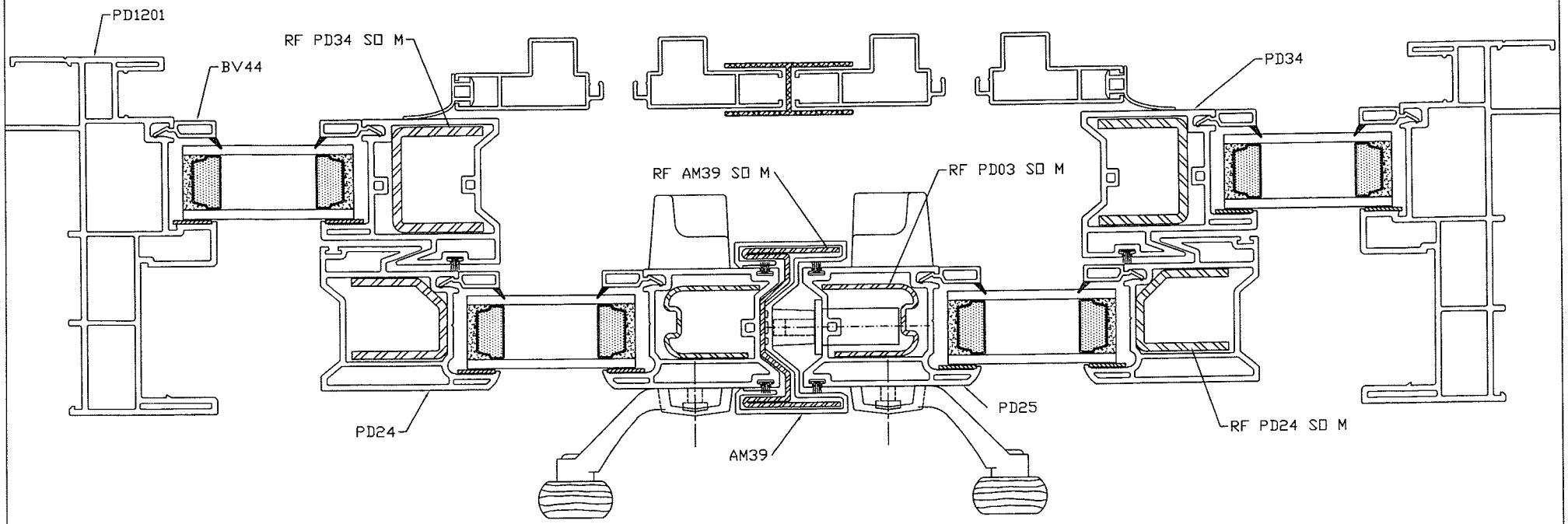
ROLLER	#10 X ½" FHP (SS)	8	MERCHANTS
FIXED MEETING STILE	#8 X 2" THP	8	MERCHANTS
LOCK HANDLE*	#8-32X 1-7/8" PHP**	4	SASH CONTROLS
MORTISE LOCK	#10 X 1-1/4" FHP(SS)	2	MERCHANTS
KEEPER	#10 X 1-1/4" PHP (SS)	8	MERCHANTS
ASTRAGAL	#10 X 1-1/4" PHP (SS)	4	MERCHANTS

* = HARDWARE SET INCLUDES SCREWS
** = COLOR
A/R = AS REQUIRED

07/1/08
Rev. 9/16/08

VEKA INC.

100 VEKA DRIVE
FOMBELL, PA 16123



Molimo
Architectural Product Testing

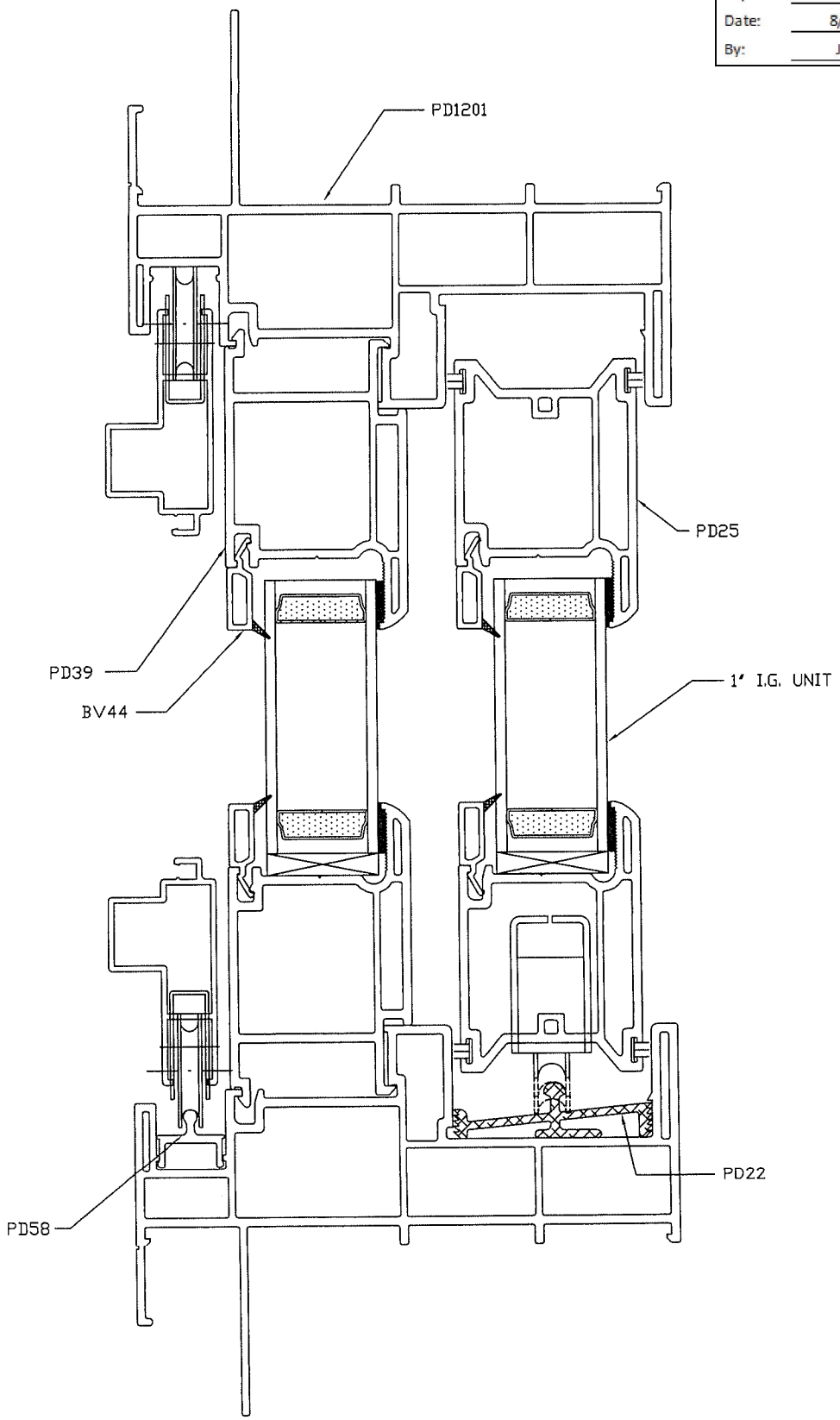
Report #:	2498.01-109-12
Date:	8/17/2020
By:	J. Allison

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I:\ENG\SYSTEM\SHELF\DOOR\PD12WW\ASY\EXT\PD12WW-AM39 25 JUNE 2020 BJF

Molimo
Architectural Product Testing

Report #:	2498.01-109-12
Date:	8/17/2020
By:	J. Allison



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	REVISIONS	DATE

VEKA INC.
100 VEKA DRIVE
FOMBELL, PA 16123

DRAWN: BJF	DATE: 06 MAY 2019	SCALE: FULL
CHK'D:	DATE:	APPV'D:
TITLE: PATIO DOOR PD12WW VERTICAL LAYOUT, EQUAL GLASS		DWG. # PD12WW-BV44