PRI Construction Materials Technologies LLC

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Laboratory Test Report

Report for: Tammy Tanksley
Croft LLC
1800 North Clark Avenue
Magnolia, MS 39652

Product Type: Aluminum Single Hung Window
Product Series: 95 Series
Project No.: 2189T0009.01
Date(s) Tested: August 28th, 2020
Results: Class R–PG40 914 x 1829mm* (36 x 72in*) - Hung

95 Series Single Hung (36" x 72") Summary	
Test Method Description	**Summary of Results**
AAMA/WDMA/CSA 101/1.S.2/A440-11:	Class R–PG40 914 x 1829mm* (36 x 72in*) - Hung
Design Test Pressure:	±1920 Pa (±40.10 psf)
Air Leakage (Infiltration):	1.0 L/s/m^2 (0.20 cfm/ft^2)
Water Penetration Resistance Test Pressure:	290 Pa (6.06 psf)
Forced Entry Resistance Grade Level:	Type "A" Grade 10

Test Methods Testing was completed as described in North American Fenestration Standard/Specification for windows, doors, and skylights (NAFS) AAMA/WDMA/CSA 101/1.S.2/A440-11. Test methods assigned or reference include: **ASTM E2068** Standard Test Method for Determination of Operating Force of Sliding Windows and Doors, **ASTM E283** Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls and Doors Under Specified Pressure Differences Across the Specimen, **ASTM E547** Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Cyclic Static Air Pressure Difference, **ASTM E330** Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Difference, **ASTM E987** Standard Test Methods for Deglazing Force of Fenestration Products, and **ASTM F588** Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact.

Report Date: 09/14/2020	**Test Record Retention Date:** 09/14/2025

Reference must be made to Project No., 2189T0009.01, dated 09/14/2020 for complete test specimen description and detailed results.

I. Product Manufacturer & Location

Croft LLC
1800 North Clark Avenue
Magnolia, MS 39652

II. Accredited Testing Laboratory

PRI-Construction Materials Technologies, LLC
6412 Badger Drive
Tampa, FL 33610

II.1.1. Testing Location: Testing was conducted at PRI-CMT located in Tampa, FL. Calibration of testing instrumentation was performed by a PRI-CMT representative in compliance with PRI-CMT In-House quality control program governed by ISO/IEC 17025-05.

III. Product Type

Aluminum Single Hung Window

IV. Product Series/Model

95 Series

V. Test Specimen Details

V.1. Sizes

V.1.1. Overall Unit Size: 914 x 1829mm (36" x 72") 1.7m^2 (18.0ft^2)
V.1.2. Vent Sash Size: 883 x 762mm (34-3/4" x 30")
V.1.3. Exterior Rail: 834mm (32-3/4")

V.2. Framing Members

V.2.1. Head/Sill/Jambs: Extruded aluminum straight cut, butted, and mechanically attached thru jambs into the corresponding head/ sill member with two (2) #8 x 5/8 screws per corner. Silicone sealant applied to each corner prior to securing.

V.2.2. All Sash Rails/Stiles: Extruded aluminum straight cut, butted, and mechanically attached thru the stiles and into the corresponding rail with one (1) #8 x 5/8 screw per corner.

V.2.3. Exterior Rail: Extruded aluminum straight cut, butted, and mechanically attached thru the jambs with one (1) #8 x 5/8 screw per end.

V.3. Daylight Opening

Location	Size		Total Area		Quantity
	mm	inches	m^2	ft^2	
Fixed Lite	829 x 1010	32-5/8 x 39-3/4	0.8	9.0	1
Vent Sash	829 x 681	32-5/8 x 26-13/16	0.6	6.1	1

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V.4. Glazing

IGU Thickness	Spacer Type	Interior Pane	Exterior Pane	Glazing Method	Glazing Bite
Dual Glaze 13mm (1/2")	Metal U-Shaped Embedded in Sealant Single Sealed	3mm (1/8") Annealed	3mm (1/8") Annealed	Both glass lites were set from the interior onto silicone adhesive and secured with pvc glazing beads.	10mm (3/8")

V.5. Weeping System – Sloped sill with drainage to the exterior.

V.6. Screen

Size	Frame Material	Frame Joinery	Mesh	Mesh Retention	Quantity
843 x 753mm (33-3/16" x 29-5/8")	Rolled aluminum	Straight cut and joined at each corner with plastic keys	Fiberglass	Flexible round spline	1

V.7. Weatherstripping

Location	Member	Description	Quantity
Frame	Exterior meeting rail interlock pocket	4.8mm (3/16") backed, 6.4mm (0.250") tall pile with single fin	1 row
Vent Sash	Stiles Exterior Face	4.8mm (3/16") backed, 4.6mm (0.180") tall pile with single fin	1 row per member
	Bottom rail exterior face	2.0mm (1/16") backed, 5.3mm (0.380") diameter hollow bulb.	1 row

V.8. Reinforcement – "No Reinforcement"

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V.9. Hardware Components

Component	Description	Location	Quantity
Sweep Lock	Formed plastic housing and lock	Each lock was mounted on the interior meeting rail approximately 191mm (7-1/2") O.C. from each end and anchored with two (2) #8 x 5/8" steel fasteners.	2
Upper Sash Guide	Molded nylon	Interior Rail top surface. Mounted to the stile, with one (1) #8 x 5/8" steel fastener per guide.	2
Lower Sash Guide	Molded plastic	Mounted to the bottom stiles, with one (1) #8 x 5/8" steel fastener per guide.	2
Side-load spiral balance system	10mm (3/8") spiral balance	Secured to the jamb pocket with one (1) #10 x 5/8" and attached to the bottom rail with a metal clip.	1 per jamb (2 total)

V.10. Installation

The test specimen was installed into a nominal 2"x10" SYP wooden test buck. The rough opening maintained a clearance of 3mm (1/8") around the perimeter. Silicone sealant compling with AAMA 800 was applied behind the nailing fin, sealing the test specimen to the test buck.

Frame Member	Dimensional Location on Member	Anchor Description
Head/Sill Nailing Fin	Through the nail fin 76mm (3") from each end and midspan. Three (3) per member six (6) total.	#8 x 1-1/2" pan head screw
Jamb Nailing Fin	Through the nail fin 76mm (3") from each end, centerline of meeting rails, and 305mm (12") O.C. thereafter. Six (6) per jamb twelve (12) total.	

VI. Equipment Utilized:

- **VI.1.** Computer controlled reversible blower with pressure transducers
- **VI.2.** Linear distance transducers
- **VI.3.** Water spray rack
- **VI.4.** Gas mass with LFE
- **VI.5.** Load Cell

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VII. Test Results: Conditions at the beginning of testing were 23°C (73°F) with 50% Rh.

Test Method	Test Pressure	Allowable	Recorded Measurement	Result
Operating Force ASTM E2068	N/A	Vent Sash Initiate Motion – Report Flow Up – 155N (35lbs) Flow Down - 155N (35lbs) Locks – 100 N (22.5lbs)	Vent Sash Initiate Motion - 125N (28lbs) Flow Up – 102N (23lbs) Flow Down – 49N (11lbs) Locks – 22N (5lbs)	**Pass**
Air Infiltration ASTM E283	75 Pa (1.57 psf)	1.5 L/s/m^2 (0.30 cfm/ft^2)	1.0 L/s/m^2 (0.20 cfm/ft^2)	**Pass**[1]
Water Intrusion ASTM E547	290 Pa (6.06 psf)	No penetration of water beyond innermost plane, excluding trim and hardware.	No Leakage	**Pass**[2]
Uniform Load Deflection ASTM E330[3,4]	±1920 Pa (±40.10 psf)	Report Only	Positive 5.3mm (0.21") Negative 4.6mm (0.18")	**Pass**[5]
Uniform Load Structural ASTM E330[3,4]	±2880 Pa (±60.15 psf)	3.3mm (0.13")	Positive 0.5mm (0.02") Negative 0.5mm (0.02")	**Pass**[5]
Forced Entry Resistance ASTM F588	N/A	No Entry	Type: "A" Grade: 10	**Pass**
Deglazing ASTM E987	Flow Members 320 N (70lbs) Other Members 230 N (50lbs)	8.6mm (0.34")	<0.3mm (0.19") <0.3mm (0.06")	**Pass**

Notes:
1. The tested specimen meets (or exceeds) the performance levels specified in AAMA/WDMA/CSA 101/I.S.2/A440 for air leakage resistance.
2. Tested with and without screen.
3. Loads were held for 10 seconds.
4. Deflection and permanent set values was captured on the meeting rails. Unsupported span measured 832mm (32.75")
5. Duct tape and polyethylene film was used for excess air leakage. It is the judgment of the test engineer that the film and tape did not influence the result of the test.

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Statement of Compliance:
Testing was conducted in accordance with methods designated in AAMA/WDMA/CSA 101/I.S.2 A440-11 North American Fenestration Standard/Specification for Windows, Doors, and Skylights. Upon completion of testing, the test specimen met the minimum performance requirements outlined for a Class R–PG40 914 x 1829mm* (36 x 72in*) – Hung. The laboratory test results presented in this report are representative of the specimen supplied. This report does not constitute certification of this product which may only be granted by the certification program administrator.

Detailed drawings showing wall thickness of all members, corner construction and hardware application are on file and have been compared to the sample submitted. A test sample will be retained at the test laboratory for a period of 2 years electronic documentation will be retained for a period of 10 years. A copy of this report has been forwarded to the Validator. Manufacturer's drawings and bill of materials are contained in Appendix A.

Official list of Witnesses:	Company:
Tim Efaw	PRI-CMT
Tim Willsey	PRI-CMT

Signed: _____
Timothy Efaw
Manager

Date: September 14th, 2020

Signed: _____
Timothy Willsey
Technician

Date: September 14th, 2020

Report Issue History:

Issue #	Date	Pages	Revision Description (if applicable)
Original	09/14/2020	19	N/A

Appendix Follows

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