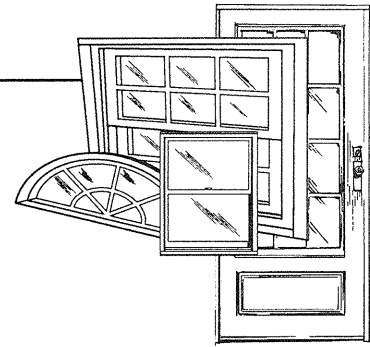


CERTIFIED TESTING LABORATORIES

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Report Number: CTLA-361W -13
Report Date: January 13, 1999

STRUCTURAL PERFORMANCE TEST REPORT

Client: NUAIR ALUMINUM WINDOW AND DOORS
8105 ANDERSON ROAD
P.O. BOX 15436
TAMPA, FLORIDA 33684

Product Type & Series: SERIES 500 ALUMINUM SLIDING GLASS DOOR SGD-C-45 (181" x 96")

Test Specification: AAMA/NWWDA 101/I.S.2-97 "Voluntary Specifications for Aluminum, Vinyl (PVC) and Wood Window and Glass Doors"

Test Specimen

Frame: The extruded aluminum flange frame measured 181"X 96" overall. Coped and butted corner construction, each frame corner secured with two (2) #8 x .625" Phillips pan head fasteners. downsize

Configuration: XXO

Panels: The "X" panel measured 61.5" x 95.125" overall. Coped and butted corner construction, each vent corner secured with one (1) #8 x .750" S.M.S., P.H. fastener. The "O" panel measured 61" x 95.125" overall. Coped and butted corner construction, each vent corner secured with one (1) #8 x .750" S.M.S., P.H. fastener.

Weatherstripping:

<u>Quantity</u>	<u>Description</u>	<u>Location</u>
Four (4) strips	Wool pile .350 high	Two (2) in each jamb
Four (4) strips	Wool pile .200" high	In both interlock stiles
One (1) strip	Wool pile .200" high	In astragal
One (1) strip	Bulb vinyl .350 o.d.	In astragal
Two (2) strips	Wool pile with integral fin .370" high	Exterior of top rail on all panels
Two (2) strips	Wool pile .350 high	Recessed into each side of bottom rail all panels.

Hardware & Location:

<u>Quantity</u>	<u>Description</u>	<u>Location</u>
One (1)	Die cast lock set and pull handle.	38" up from sill on lock stile
Two (2)	Single roller assemblies	Each end of bottom rail all panels
Two (2)	"O" clips	Fixed panel stile

Howe, G. P. E.
1/21/99

Glazing: All panels were marine glazed with 3/16" tempered glass and black extruded vinyl wrap around glazing gasket.

Sealant: All frame corners were sealed with a narrow joint seal. All mechanical joints on panels were sealed with silicone sealant.

Weep System: There were three (3) weep notches in each end of sill measuring .800" x leg high.

Reinforcement: The interlock stiles had two (2) 1 1/2" x 1/2" steel flat bar stock the full length of the stile. The astragal had one (1) 2" x 3/8" steel flat bar stock the full length of the astragal.

Additional Description: The astragal stile had three (3) pieces of angle 2" x 1" x 1/8" x 2 1/4" long. One (1) in the head secured to interior track with two (2) 3/16 x 2 1/4" tap cons, and two (2) in the sill secured to the interior and exterior with two (2) 3/16 x 2 1/4" tap cons. The interlock stile had two (2) pieces of 2" x 1" x 1/8" x 2 1/4" long angle secured to the stile interior and exterior track with two (2) 3/16 x 2 1/4" tap cons. Sill adaptor was .062" aluminum flat bar secured to sill with aluminum rivets 4" from each end and 10" o.c.

Screen: Extruded aluminum screen frame, fiberglass mesh with vinyl spline, two (2) spring roller assemblies in the top rail and two (2) spring roller assemblies in the bottom rail.

Installation: Twenty-six (26) #8 x 1" Phillips pan head fasteners were used to secure the specimen to the wooden test buck. Fourteen (14) in the head in two (2) parallel rows 6", 38", 70", 96", 122", 152" and 178" measuring from left to right. Six (6) in each jamb in two (2) parallel rows 4", 59" and 92" measuring from head to sill. Fourteen (14) #8 x 1 1/2" Phillips counter sunk fasteners in the sill in two (2) parallel rows 6", 38", 70", 96", 122", 152" and 178" measuring from left to right.

Surface Finish: White

Comment: Nominal 2 mil polyethylene film was used to seal against air leakage during structural loads. The film was used in a manner that did not influence the test results.

Performance Test Results

<u>Paragraph No.</u>	<u>Title of Test</u>	<u>Method</u>	<u>Measured</u>	<u>Allowed</u>
*2.1.2	Air Infiltration @ 1.57psf The specimen tested exceeds the performance levels specified in AAMA/NWWDA101/I.S.2-97 for air infiltration.	ASTM E 283-91	.32 cfm/ft ²	.34 cfm/ft ²
*2.1.3	Water Resistance 5.0 gph/ft ² 1 1/2" Sill heigh overall WTP=4.5 2" Sill height overall WTP=6.7 2 1/2" Sill heigh overall WTP=9.0 3" Sill height overall WTP=11.25 Testing conducted with and without insect screen.	ASTM E 547-93 Four (4) 5 min. cycles ASTM E 331-93 15 min. duration	No Entry No Entry No Entry No Entry	No Entry No Entry No Entry No Entry

Handwritten signature: [Signature]
 1/27/99

Performance Test Results (cont.)

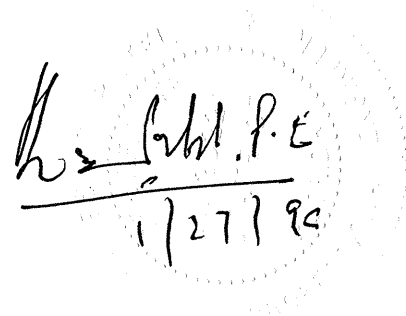
<u>Paragraph No.</u>	<u>Title of Test</u>	<u>Method</u>	<u>Measured</u>	<u>Allowed</u>
2.1.4./3.4.2	Uniform Load Structural Permanent Deformation	ASTM E 330-90 10 second load duration		
	@ 67.5 psf Positive		.230"	.384"
	@ 67.5 psf Negative		.085"	.384"
*2.1.8	Forced Entry Resistance Results	AAMA 1303.5-76		
	Test A		0"	1/2"
	Test B		0"	1/2"
	Test C		0"	1/2"
	Test D,E,F		0"	1/2"
	Test G		0"	1/2"
2.2.19.5.1	Operating Force	AAMA/NWWDA 101/LS.2-97		
	To open, left panel		21 lbs	30 lbs.
	To open, right panel		22 lbs	30 lbs
	To keep in motion, left panel		13 lbs.	20 lbs.
	To keep in motion, right panel		11 lbs.	20 lbs.
*2.2.1.6.2	Deglazing	ASTM E 987-88		
	Top Rail 50 lbs.		.004" = 0.8% <100%	
	Bottom Rail 50 lbs.		.003" = 0.6% <100%	
	Left Stile 70 lbs.		.011" = 2.2% <100%	
	Right Stile 70 lbs.		.009" = 1.8% <100%	

* Reference CTL-A361W

Testing conducted at NUAIR Aluminum Window and Doors, in Tampa, Florida.

Test Date: December 1, 1998

Test Completion Date: December 4, 1998



 [Signature] P.E.
 1/27/98

Remarks: Detail drawings were available for laboratory records and comparison to the test specimen at the time of this report. A copy of this report along with representative sections of the test specimen will be retained by CTL for a period of four (4) years. The results obtained apply only to the specimen tested.

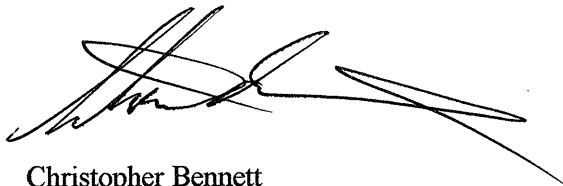
This test report does not constitute certification of this product, but only the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Certified Testing Laboratories assumed that all information provided by the client is accurate and that the physical and chemical properties of the components are as stated by the manufacturer.

Witness:

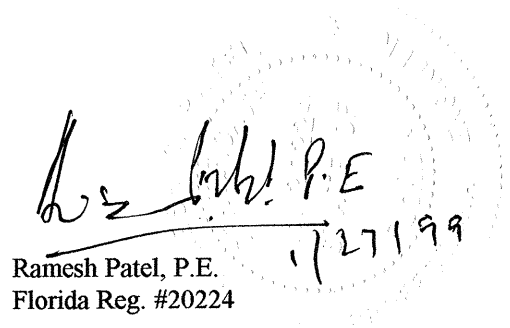
Christopher Bennett, CTL
Jens Rosowski, NUAIR
Ken Moran, NUAIR

Certified Testing Laboratories, Inc.



Christopher Bennett
Laboratory Manager

cc: NUAIR (2)
NAMI (2)
Ramesh Patel P.E.
File



Ramesh Patel, P.E.
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