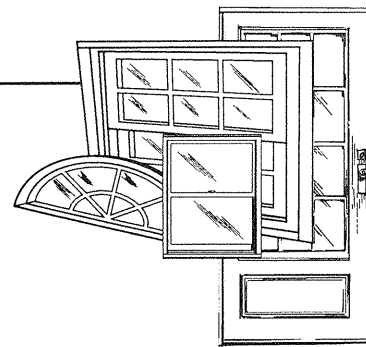


CERTIFIED TESTING LABORATORIES

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Report Number: CTLA-443W & W-1R
Report Date: August 8, 2000

STRUCTURAL PERFORMANCE TEST REPORT

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

Product Type & Series: SERIES 200 ALUMINUM SLIDING GLASS DOOR SGD-C-30 (144" x 96") and
SERIES 200 ALUMINUM SLIDING GLASS DOOR SGD-C-35
(144" x 80" DOWNSIZE)

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

Test Specimen

Frame: (Gateway) The extruded aluminum flange frame measured 144" X 96" overall. Coped and butted corner construction, each corner secured with two (2) #8 x 5/8" Phillips pan head fasteners. The downsize frame measured 144" x 80".

Configuration: XXO

Panels: The fixed astragal panel measured 49.125" x 94.5" overall. The operable panels each measured 48.5" x 94.5" overall. Coped and butted corner construction. Each corner secured with one (1) #8 x .750" Phillips pan head fastener. The downsize astragal panels measured 49.125" x 78.5" overall. The downsize operable panels each measured 48.5" x 78.5" overall.

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 .250 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 .500 high	Recessed into each side of bottom rail all panels.

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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

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

Sealant: All frame corners were sealed with silicone sealant.

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

Reinforcement: Reinforcement in astragal. Two (2) pieces of aluminum bar stock one (1) piece measured 1" x 3/8" x length of astragal, one (1) piece measured 1" x 1/2" x length of astragal. Then tested with one (1) piece of steel bar stock measuring 1" x 3/8" x length of astragal.

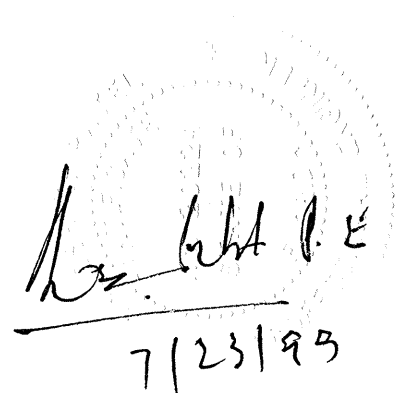
Additional Description: The units were tested with aluminum reinforcement and steel reinforcement, both gateway and downsize units achieved the same design pressure.

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 Eight (28) # 8 x 1" counter sunk fasteners were used to secure the specimen to the wooden test buck. Twelve (12) in the head, located 8", 34", 60", 86" 122", and 138" measuring from left jamb to right jamb. Eight (8) in each jamb, in two (2) parallel rows located 4", 37", 53" and 91" measuring from head to sill. Twelve (12) # 8 x 1.5" in the sill located 8", 34", 60", 86" 122", and 138" measuring from left jamb to right jamb The downsize unit had twenty four (24) # 8 x 1" counter sunk fasteners. Twelve (12) in the head, in two (2) parallel rows measuring from left jamb to right jamb 8", 34", 60", 86", 112", and 138". Six (6) in each jamb, in two (2) parallel rows measuring from head to sill 4", 42" and 75". Twelve (12) # 8 x 1.5" in the sill located 8", 34", 60", 86" 122", and 138" measuring from left jamb to right jamb

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.


7/23/93

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	ASTM E 283-91	.32 cfm/ft ²	.34 cfm/ft ²
The specimen tested exceeds the performance levels specified in AAMA/NWWDA101/I.S.2-97 for air infiltration.				
2.1.3	Water Resistance 5.0 gph/ft ²	ASTM E 547-93 Four (4) 5 min. cycles		
	1½" Sill heigh overall WTP=4.5	ASTM E 331-93	No Entry	No Entry
	2" Sill height overall WTP=6.7	15 min. duration	No Entry	No Entry
	2½" Sill heigh overall WTP=9.0		No Entry	No Entry
	3" Sill height overall WTP=11.25		No Entry	No Entry
Testing conducted with and without insect screen.				
2.1.4./4.4.2	Uniform Load Structural Permanent Deformation	ASTM E 330-90 10 second load duration		
GATEWAY UNIT With Aluminum Reinforcement				
144" X 96"	@ 45 psf Positive		.330"	.378"
	@ 45 psf Negative		.350"	.378"
GATEWAY UNIT With Steel Reinforcement				
144" X 96"	@ 45 psf Positive		.295"	.378"
	@ 45 psf Negative		.300"	.378"
DOWNSIZE UNIT With Aluminum Reinforcement				
144" X 80"	@52.5 psf Positive		.095"	.320"
	@52.5 psf Negative		.082"	.320"
DOWNSIZE UNIT With Steel Reinforcement				
144" X 80"	@52.5 psf Positive		.182"	.320"
	@52.5 psf Negative		.195"	.320"
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"
2.2.1.6.2	Deglazing	ASTM E 987-88		
	Top Rail 50 lbs.		.006" = 1.2% <100%	
	Bottom Rail 50 lbs.		.007" = 1.4% <100%	
	Left Stile 70 lbs.		.015" = 3.0% <100%	
	Right Stile 70 lbs.		.009" = 1.8% <100%	
2.2.19.5.1	Operating Force	AAMA/NWWDA 101/I.S.2-97		
	To open, left panel		9 lbs	30 lbs.
	To open, right panel		8 lbs	30 lbs
	To keep in motion, left panel		5 lbs.	20 lbs.
	To keep in motion, right panel		5 lbs.	20 lbs.

The Air Infiltration, Water Resistance, Forced Entry, Operating Force and Deglazing testing was conducted on the Gateway unit 144" x 96".

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

[Signature]
 7/23/99

Test Date: August 18, 1999

Test Completion Date: August 19, 1999

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.

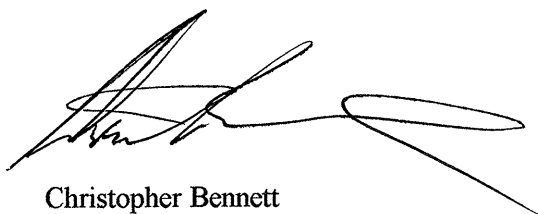
This test report does not constitute certification of this product, but only the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

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.

All Tests Witnessed by:

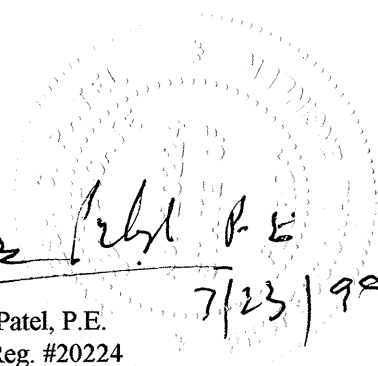
Jens Rosowski Nuair
Ken Moran Nuair
Chris Bennett CTL

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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