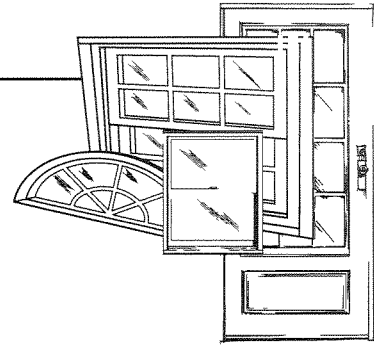


CERTIFIED TESTING LABORATORIES

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Report Number: CTLA-809W-2
Test Date: December 19, 2001
Report Date: January 28, 2002

STRUCTURAL PERFORMANCE TEST REPORT

Client: NORANDEX
4504 - 30th STREET WEST
BRADENTON, FLORIDA 34207

Product Type and Series: SERIES 437 SINGLE HUNG ALUMINUM WINDOW
(53" x 51") Downsized.

Test Specification: ASTM E330-96 Standard Test Method For Structural Performance Of Exterior Windows, Curtain Wall, and Doors by Uniform Static Air Pressure Difference.

Test Specimen

Frame: The flange frame was 53.125" x 50.625" overall and of coped corner construction. The header jamb corners used one (1) # 6 x 1" P.H. S.M.S. fastener. The sill jamb corner employed two (2) # 6 x 1" P.H. S.M.S. fasteners. The fixed meeting rail employed two (2) # 6 x 1" P.H. S.M.S. fasteners into each jamb. The sill riser was riveted to each jamb on the interior surface.

Ventilators: The active sash measured 50.5" x 39.0". A fixed light glazed at the top with a clear opening of 48.5" x 35". The active sash corners were fastened with one (1) # 6 x 1" P.H., S.M.S. fastener.

Weatherstripping: A single strip of center fin pile weatherstrip .220" high was used in the fixed rail, and left and right stiles, a .312 o.d. bulb vinyl was used in the sash bottom rail.

Hardware & Location: A block and tackle balance system was employed. One take out clip on the interior of each jamb track 5" from frame header. A rigid vinyl sash stop was located at the top of each interior jamb track. An injection molded plastic sash guide was used at the top of each sash stile. One (1) metallic cam lock were fastened to the sash meeting rail mid-span locking into metallic keepers fastened to the fixed rail.

Glazing: DSB annealed glass, interior glazed using a silicone bedding compound and rigid vinyl snap in glazing bead.

Sealant: A narrow joint seam sealer was used on jamb sill corners. A foam rubber gasket was employed at all four main frame corners.

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Weepholes: Sash and screen retaining leg notched .500" x lg. ht. each sill corner.

Muntins: None

Reinforcement: None

Additional Description: Unit tested had a sill height of 1.940" drawing # XFLA 3K

Screen: Insect screen with plastic corner keys, vinyl pull tabs, fiberglass mesh, and vinyl spline. Two (2) retainer springs.

Installation: Test specimen was fastened to the wooden test buck with eleven (11) # 10 x 1.75" P.P.H. screws. Three (3) in the head located 6" from each corner and at center span. Each jamb was fastened with four (4) # 10 x 1.75" P.P.H., SMS. located measuring from head to sill 4", 18", 32", and 46". None at sill.

Surface Finish: Bronze

Performance Test Results

<u>Paragraph No.</u>	<u>Title of Test</u>	<u>Test Method</u>	<u>Measured</u>	<u>Allowed</u>
2.1.4.2/4.4.2	Uniform Load Structural Permanent Deformation @ 67.5 psf Exterior @ 67.5 psf Interior	ASTM E330-90 Ten (10) second Loading	.023" .008"	.198" .198"

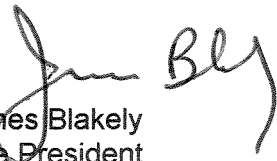
Test Completion Date: December 20, 2001

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.

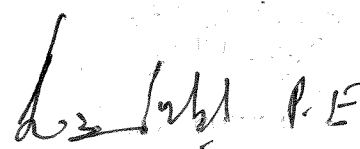
This test report does not constitute certification of this product, but only that the above test results were obtained using the designated test methods and they indicate compliance with the performance requirements (paragraphs as listed) of the above referenced specifications.

Certified Testing Laboratories assumes 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.

Certified Testing Laboratories, Inc.


James Blakely
Vice President

cc: NORANDEX (2)
A.L.I. (2)
Ramesh Patel, P.E. (1)
File (1)


Ramesh Patel, P.E.
Florida Reg. #20224
1/31/02