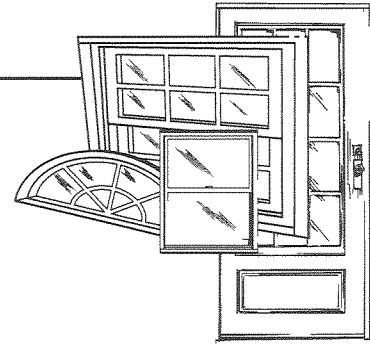


CERTIFIED TESTING LABORATORIES

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Report Number: CTLA-432W
Report Date: July 21, 1999

STRUCTURAL PERFORMANCE TEST REPORT

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

Product Type and Series: Series 437 Picture Window F-C 60 (111" x 63")

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

Test Specimen

Frame: The extruded aluminum flange frame measured 111" x 63" overall. Two (2) sill corners employed coped corner construction, incorporating two (2) #8 x 3/4" P.H. pan head fasteners. Two (2) head corners were mitered and mig welded, tacked to each screw boss.

Configuration: Fixed lite, a clear lite opening of 109" x 61".

Weatherstripping: None

Hardware & Location: None

Glazing: Interior glazed 3/16" tempered glass. Silicone type adhesive back bedding compound and closed cell glazing tape. An extruded aluminum "U" channel (Norandex drawing #XDW-6) secured to the frame with thirty two (32) #8 x 1" P.H. countersunk Tek fasteners, ten (10) in the head and (10) in the sill located 4" from each jamb, 12" o.c. Six (6) in each jamb located 4" from head and sill 12" o.c.

Sealant: A white narrow joint sealant was used on all frame corners.

Weep Systems: None

Reinforcement: None

Additional Description: None

Screen: None

Installation: See installation drawing

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

[Handwritten Signature]
8/14/99

Performance Test Results

<u>Paragraph No.</u>	<u>Title of Test</u>	<u>Test Method</u>	<u>Measured</u>	<u>Allowed</u>
2.1.2	Air Infiltration @ 6.24 psf	ASTM E283-91	.0 cfm/ft ²	.37 cfm/ft ²

The tested specimen exceeds the performance requirements specified in AAMA/NWWDA 101/I.S.2-97. Results recorded in two (2) decimals at the clients request.

2.1.3/4.3	Water Resistance 5.0 gph/ft ² WTP=15 psf	ASTM E547-93 Four (4) five minute cycles ASTM E331-93 Fifteen (15)minute duration	No Entry	No Entry
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2.1.4.2/4.4.2	Uniform Load Structural Permanent Deformation @ 90 psf Exterior @ 90 psf Interior	ASTM E-330-90 Ten (10) second duration	.0" .0"	.252" .252"
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2.1.8 Forced Entry Resistance ASTM E588-97
T₁ = 5 minutes Tools used: A spatula (10.1.1.1) a piece of stiff wire (10.1.1.2)
The test specimen meets the performance Grade 10

Test Date: July 16, 1999

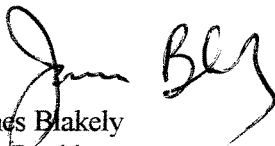
Test Completion Date: July 16, 1999

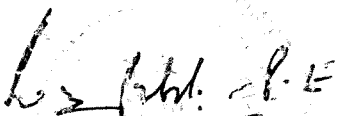
Remarks: Detail drawings were available for laboratory records and comparison to the test specimen at the time of this report. A copy of this report along with representative sections of the test specimen will be retained by CTL for a period of four (4) years. The results obtained apply only to the specimen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

This test report does not constitute certification of this product, but only 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 8/4/99