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FAX (717) 767-4100
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ALUMIL N.A. CORPORATION
AAMA/ WDMA/ CSA 101/ I.S.2/ A440-05
TEST SUMMARY REPORT

Report No: NCTL-110-12664-1S
Expiration Date: 02/28/14

Test Specimen

Manufacturer:	*Alumil N.A. Corporation*
Product Type:	*Casement Aluminum Prime Window*
Series/Model:	*"Alutherm Plus M11000"*
Primary Product Designation:	*C-AW150 914.4 x 1524 (36x60)*
Optional Product Designation:	*Not Applicable*
Test Completion Date:	*02/24/10*

Reference should be made to Structural Performance Test Report Number NCTL-110-12664-1 for complete specimen description and test data.

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JAY LEADER
Technician

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STRUCTURAL PERFORMANCE TEST REPORT

Report No: NCTL-110-12664-1
Test Date: 02/24/10
Report Date: 02/25/10
Expiration Date: 02/28/14

Client: *Alumil N.A. Corporation*
4401 21ST Street, Suite 203
Long Island City, NY 11101

Test Specimen: *Alumil N.A. Corporation's Model "Alutherm Plus M11000" Casement Aluminum Prime Window C-AW150 914.4 x 1524 (36x60).*

Test Specification: *AAMA/WDMA/CSA 101/I.S.2/A440-05, "Standard/Specification for Windows, Doors and Unit Sky Lights."*

TEST SPECIMEN DESCRIPTION

General: *The test specimen was an inswinging casement aluminum prime window measuring 914.4 mm (36") wide by 1524 mm (60") high overall. The vent measured 855.66 mm (33-11/16") wide by 1468.44 mm (57-13/16") high. The frame and vent were thermally broken using insul-bar thermal barriers. A single handle five (5) point integrated lock was located at midspan of the lockstile. Three (3) lock points were located at the lockstile and one (1) lock point was located at midspan of the top and bottom rails. The metal keepers were located on the frame at the lock positions. A metal pin-type hinge was located at the top, bottom and midspan of the hinge jamb. The frame and vent were of mitered corner construction with staked-in-place extruded aluminum corner gussets.*

Glazing: *The vent was interior glazed using sealed insulating glass with a vinyl four (4) leaf glazing gasket back-bedding and a snap-in extruded aluminum glazing bead with a flexible vinyl wedge gasket. The overall insulating glass thickness was 22.23 mm (7/8") consisting of two (2) lites of 5 mm (3/16") annealed glass and one (1) space created by an aluminum-reinforced butyl spacer system. (A5-D).*

Weatherseals: *One (1) strip of two (2) leaf vinyl weatherstrip was located at the vent perimeter. One (1) strip of single-leaf gooseneck vinyl weatherstrip was located at the frame perimeter. One (1) strip of single-leaf vinyl weatherstrip was located at the frame perimeter.*

Weeps: *One (1) weep hole measuring 9.53 mm (3/8") in diameter was located at 101.6 mm (4") from each end of the bottom rail. One (1) weep hole measuring 33.34 mm (1-5/16") x 9.53 mm (3/8") was located at 104.78 mm (4-1/8") from each end of the exterior sill face.*

Interior & Exterior Surface Finish: *Mill finish aluminum.*

Sealant: *The frame and vent corners were sealed with a silicone sealant. The glazing perimeter was back-filled with a silicone sealant.*

Installation: *The specimen was installed into a standard grade 50.8 mm (2") x 254 mm (10") lumber test buck. The specimen was secured to the buck with a 127 mm (5") x 127 mm (5") x 7.94 mm (5/16") thick steel plate located at 177.8 mm (7") from each end of the head and sill and 330.2 mm (13") from each end of the jambs. Each steel plate was secured with two (2) #10 x25.4 mm (1") screws to the frame and one (1) #10 x 44.45 mm (1-3/4") screw to the buck. The exterior perimeter was sealed with a silicone sealant.*

TEST RESULTS

Par. No.	*Title of Test & Method*	*Measured*	*Allowed*
5.3.1.1	*Operating Force - ASTM E 2068 (Prior to Cycling)*		
	Vent — Initiate Open	*116 N (26 lbf)*	-----
	Maintain Open	*98 N (22 lbf)*	*135 N (30 lbf)*
	Initiate Close	*89 N (20 lbf)*	-----
	Maintain Close	*107 N (24 lbf)*	*135 N (30 lbf)*
5.3.2	*Air Infiltration - ASTM E 283 (Prior to Cycling)*		
	300 Pa – (6.2 psf) (50 mph)	*0.5 L/ (sec• m²) (0.1 cfm/ft²) (<0.01 cfm/ft²) measured*	*0.5 L/ (sec• m²) (0.1 cfm/ft²)*
5.3.3	*Water Penetration - ASTM E 331 ASTM E 547 (Prior to Cycling)*		
	3.4 L/ (min• m²) 5.0 gph/ft²		
	WTP= 390 Pa (8.0 psf)	*No Leakage*	*No Leakage*
5.3.4.2 **	*Uniform Load Deflection - ASTM E 330*		
	1920 Pa (40.0 psf) Exterior	*0.25 mm (0.010")*	*4.34 mm (0.171")*
	1920 Pa (40.0 psf) Interior	*0.20 mm (0.008")*	*4.34 mm (0.171")*
5.3.4.3 **	*Uniform Load Structural - ASTM E 330*		
	2880 Pa (60.0 psf) Exterior	*0.03 mm (0.001")*	*1.52 mm (0.060")*
	2880 Pa (60.0 psf) Interior	*0.05 mm (0.002")*	*1.52 mm (0.060")*
5.3.5	*Forced Entry Resistance Test - ASTM F 588 Grade 10*	*Meets As Stated*	
5.3.6.4.2	*Sash/Leaf Torsion Test*	*24.54 mm (0.966")*	*65.15 mm (0.2565")*
5.3.6.4.3	*Sash Vertical Deflection Test*	*0.76 mm (0.030")*	*1.70 mm (0.067")*

5.3.6.9 Life Cycle Test – AAMA 910
1st Half – Vent – 1250 Total Cycles

2.1.4 910	*Vent Panel Cycling Testing (First Half)*	
2.2.3	*Vent Cycling*	*Meets as Stated*
2.1.5 910	*Locking Hardware Cycle Testing (First Half)*	
2.3	*Locking Hardware Cycling*	*Meets as Stated*
2.1.6 910	*Access Panel Cycling (First Half)*	
2.4	*Access Paneling Cycling*	*Meets as Stated*

TEST RESULTS *(Continued)*

Par. No.	*Title of Test & Method*	*Measured*	*Allowed*
2.1.7 910	*Misuse Testing*		
	2.5.2.1 Ventilator Torsion Test	*Meets as Stated*	
	2.5.2.2 Ventilator Vertical Load Test	*Meets as Stated*	
Life Cycle Test			
2nd Half – Vent – 1250 Total Cycles			
2.1.8 910	*Vent Cycling Testing (Second Half)*		
	2.2.3 Vent Cycling	*Meets as Stated*	
2.1.9 910	*Locking Hardware Cycle Testing (Second Half)*		
	2.3 Locking Hardware Cycling	*Meets as Stated*	
2.1.10 910	*Operating Force - ASTM E 2068 (After Cycling)*		
	Vent Initiate Open	*98 N (22 lbf)*	-----
	Maintain Open	*89 N (20 lbf)*	*135 N (30 lbf)*
	Initiate Close	*89 N (20 lbf)*	-----
	Maintain Close	*89 N (20 lbf)*	*135 N (30 lbf)*
2..1.11 910	*Air Infiltration - ASTM E 283 (After Cycling)*		
	300 Pa – (6.2 psf) (50 mph)	*0.5 L/ (sec• m²)*	*0.5 L/ (sec• m²)*
		(0.1 cfm/ft²)	*(0.1 cfm/ft²)*
		(0.01 cfm/ft²) measured	
2.1.12 910	*Water Penetration - ASTM E 331 ASTM E 547 (After Cycling)*		
	3.4 L/ (min• m²) 5.0 gph/ft²		
	WTP= 390 Pa (8.0 psf)	*No Leakage*	*No Leakage*

OPTIONAL PERFORMANCE

4.4.2.6	*Water Penetration - ASTM E 331 ASTM E 547 (Prior to and After Cycling)*		
	3.4 L/(min• m²) 5.0 gph/ft²		
	WTP= 960 Pa (20.0 psf)	*No Leakage*	*No Leakage*
4.4.2.6.2 **	*Uniform Load Deflection - ASTM E 330*		
	7200 Pa (150.0 psf) Exterior	*1.02 mm (0.040")*	*4.34 mm (0.171")*
	7200 Pa (150.0 psf) Interior	*0.86 mm (0.034")*	*4.34 mm (0.171")*
4.4.2.6.2 **	*Uniform Load Structural - ASTM E 330*		
	10800 Pa (225.0 psf) Exterior	*<0.025 mm (<0.001")*	*1.52 mm (0.060")*
	10800 Pa (225.0 psf) Interior	*0.13 mm (0.005")*	*1.52 mm (0.060")*

* *Tested with and without insect screen*

** *No glass breakage or permanent damage causing the unit to be inoperable.*

TEST COMPLETED 02/24/10

The tested specimen meets (or exceeds) the performance level specified in AAMA/WDMA/CSA 101/I.S.2/A440-05 for air leakage resistance. The listed results were secured by using the designated test methods and indicate compliance with the performance requirements of the referenced specification paragraphs for the C-AW150 914.4 x 1524 (36x60) product designation.

This test report was prepared by National Certified Testing Laboratory (NCTL), for the exclusive use of the above named client and it does not constitute certification of this product. The results are for the particular specimen tested and do not imply the quality of similar or identical products manufactured or installed from specifications identical to the tested product. The test specimen was supplied to NCTL by the above named client. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimen are to be drawn from the ASTM E 330 test. Foam tape is mounted to the perimeter of the test buck prior to clamping to the test wall. NCTL is a testing lab and assumes that all information provided by the client is accurate and does not guarantee or warranty any product tested or installed.

Detailed drawings were available for laboratory records and compared to the test specimen at the time of this report. Component drawings were reviewed for product verification. The bill of materials contains details with any deviations noted. Ambient conditions during the referenced testing are available upon request. A copy of this report along with representative sections of the test specimen will be retained by NCTL. This report does not constitute certification or approval of the product, which may only be granted by a certification program validator or recognized approval entity. All tests were conducted in full compliance with the referenced specifications and/or test methods. This report may not be reproduced, except in full, without the written consent of NCTL.

NATIONAL CERTIFIED TESTING LABORATORIES

JAY LEADER
Technician

ROBERT H. ZEIDERS, P.E.
Vice-President Engineering & Quality

JL/krr

APPENDIX A

Forced Entry Resistance Test Results

***Test Method**: ASTM F 588-07, "Standard Test Methods for Measuring the Forced Entry Resistance of Window Assemblies, Excluding Glazing Impact". Grade 10*

TEST RESULTS

Operable Panel

Paragraph No.	*Loads*	*Duration*	*Measured*	*Allowed*
A2.1 –Disassembly Test	*N/A*	*5 Minutes*	*No Entry*	*No Entry*
A2.2 -Lock Manipulation	*N/A*	*5 Minutes*	*No Entry*	*No Entry*
A2.3 –Sash Manipulation	*N/A*	*5 Minutes*	*No Entry*	*No Entry*
A2.6.2 -Test B1	*L2= 333 N (75 lbf)*	*1 Minute*	*No Entry*	*No Entry*
A2.6.3 -Test B2	*L1= 667 N (150 lbf)* *L2= 333 N (75 lbf)*	*1 Minute*	*No Entry*	*No Entry*
A2.6.4 -Test B3	*L1= 667 N (150 lbf)* *L2= 333 N (75 lbf)*	*1 Minute*	*No Entry*	*No Entry*
A2.2 - Lock Manipulation	*N/A*	*5 Minutes*	*No Entry*	*No Entry*
A2.3 -Sash Manipulation	*N/A*	*5 Minutes*	*No Entry*	*No Entry*

APPENDIX B

Section 1:

Component Drawings, with Applicable Part Numbers, Manufacturing and Modeling Details, were Reviewed (as submitted) for Product Verification
(Reference: NCTL-110-12664-1)

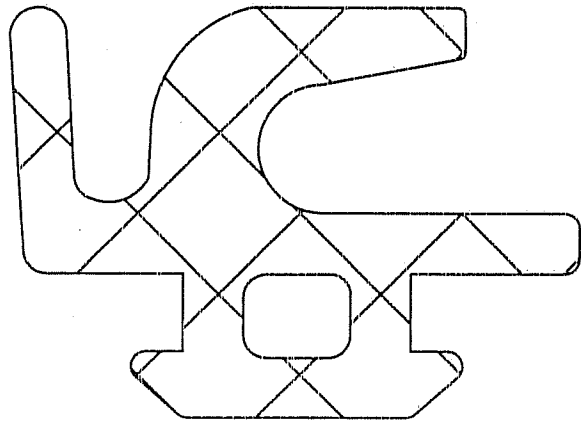
See Attached Documentation;
any deviations noted.

Note: The above referenced component drawings along with representative sections of the test specimen will be retained per procedure by NCTL. This testing facility assumes that all information provided by the client is accurate.

Section 2:

Identification	Date	Page & Revision
Original Issue	02/25/10	Not Applicable

EPDM GASKET BETWEEN FRAME & SASH
220-110-0200



TEST SPECIMEN COMPLIES
WITH THESE DETAILS.
ANY DEVIATION IS NOTED
REPORT NO. NCTL-110-12664-1
TEST DATE 2/24/10