NATIONAL CERTIFIED TESTING LABORATORIES

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ASTM E283-04(12)
ASTM E330-14
ASTM E331-00(09)
ASTM E547-00(09)

STRUCTURAL PERFORMANCE TEST REPORT SUMMARY

RENDERED TO:
Alumin Techno LLC
Silitskogo Str. 12-211 220075 FEZ Minsk
Minsk area, Minsk region
The Republic of Belarus

MODEL/TYPE: "CW2" Fixed Curtain Wall

TITLE	SUMMARY OF RESULTS
Air Infiltration 75 Pa (1.57 psf)	0.10 L/s/m^2 (0.02 cfm/ft^2 measured)
Air Infiltration 300 Pa (6.24 psf)	0.15 L/s/m^2 (0.03 cfm/ft^2 measured)
Water Penetration Resistance	574.6 Pa (12.0 psf)
Design Pressure	± 3591.02 Pa (75.0 psf)
Uniform Load Structural Test	± 5386.53 Pa (112.5 psf)

Test Completion Date: 06/26/14

Reference must be made to Report Number NCTL-110-16401-1 dated 08/20/14 for complete test sample description and data.

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DIGITAL SIGNATURE

Jay Leader
Technician

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STRUCTURAL PERFORMANCE TEST REPORT

Report Number NCTL-110-16401-1

Report Date 08/20/14

Report To Alumin Techno LLC
Selitskogostr. 12-211220075 FEZ Minsk
Minsk area, Minsk region
The Republic of Belarus

Starting Test Date 05/20/14
Ending Test Date 06/26/14

Specification ASTM E283-04(12), "Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen."

ASTM E331-00(09), "Standard Test Method for Water Penetration of Exterior Windows, Curtain Walls, and Doors by Uniform Static Air Pressure Difference."

ASTM E547-00(09), "Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Cyclic Static Air Pressure Difference."

ASTM E330-14, "Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls and Doors by Uniform Static Air Pressure Difference."

Description of Sample Tested

Note: All dimensions are in the order (Width x Height x Thickness) unless otherwise noted.

Model/Type "CW2"

Configuration Fixed Curtain Wall

Frame Size 2438 mm x 2438 mm (96" x 96")

Fixed Viewing Area (2) 1149 mm x 2343 mm (45.25" x 92.25")

Frame Type Extruded aluminum with vinyl-wrapped foam thermal breaks

Joint Construction Frame/ Intermediate
Butt-type aluminum clip (4) screw

Glazing Components
Overall 25.15 mm (0.990") nominal
Glass Thickness (2) Lites of 6 mm (0.224") nominal tempered glass
Spacer Type/ Size 13.77 mm (0.542") Desiccant-filled aluminum spacer (Type A1-D)

Glazing System Exterior glazed against EPDM hollow bulb single-leaf gasket and held-in-place with silicone and (4) aluminum glazing clips evenly spaced at the verticals

Weatherstrip
Type (1) Strips of EPDM hollow bulb single-leaf gasket
Location Intermediate glazing

Type	(1) Strip of EPDM hollow bulb single-leaf gasket
Location	All frame glazing members and exterior trim

Auxiliary

Type	Rigid vinyl insert
Location	All frame members secured with evenly spaced screws
Type	Rigid vinyl joinery cover
Location	Frame and intermediate joinery
Type	Aluminum trim
Location	Exterior of frame
Type	Aluminum shim
Location	Evenly spaced at the glazing perimeter
Type	Aluminum spacer fastened with (2) screws
Location	Frame/ intermediate located at aluminum shims
Type	Auxiliary aluminum glazing molding
Location	Glazing track

Reinforcement

Type	Extruded aluminum tube
Thickness	2.16 mm (0.085”)
Location	Jambs and intermediate

Interior & Exterior Surface Finish White painted aluminum

Installation Method The window was installed in a 50.8 mm by 254 mm (2” x 10”) spruce-pine-fir lumber test buck with (1) 16 gauge 50.8 mm (2”) by 152.4 mm (6”) by 152 mm (0.060”) thick steel strap located at the ends of each jamb and intermediate. Each strap was secured to the frame/ intermediate with (4) #12 x 19 mm (0.75”) flat head screws and (4) #8 x 31.75 mm (1.25”) drywall screws to the buck. The exterior perimeter was sealed with silicone.

Test Results

Test Method	Test
ASTM E283-04(12)	Air Leakage Resistance

Information at 75 Pa (1.6 psf)

Total Air Flow	=	0.76 L/s (1.6 cfm)
Extraneous Air Leakage $_{Tare}$	=	0.28 L/s (0.6 cfm)
Infiltration Rate/ Area	=	0.10 L/s/m^2 (0.02 cfm/ft^2)

Information at 300 Pa (6.24 psf)

Total Air Flow	=	1.93 L/s (4.1 cfm)
Extraneous Air Leakage $_{Tare}$	=	1.04 L/s (2.2 cfm)
Infiltration Rate/ Area	=	0.15 L/s/m^2 (0.3 cfm/ft^2)

Test Method	Test
ASTM E547-00(09) ASTM E331-00(09)	Water Resistance Test

3.4 L/ (min• m^2) (5.0 gph/ft^2)

No Leakage after 4 cycles of 5 minutes at 574.6 Pa (12.0 psf)
No Leakage after 1 cycle of 15 minutes at 574.6 Pa (12.0 psf)

Test Method	Test
ASTM E330-14	Uniform Load Deflection at Design Pressure

No damage after positive	3591.02 Pa (75.0 psf) held for 10 seconds
No damage after negative	3591.02 Pa (75.0 psf) held for 10 seconds
Measured Deflection $_{Positive}$	= 27.54 mm (1.084 inches)
Measured Deflection $_{Negative}$	= 27.64 mm (1.088 inches)

Test Method	Test
ASTM E330-14	Uniform Load Structural Test

No damage after positive	5386.53 Pa (112.5 psf) held for 10 seconds
No damage after negative	5386.53 Pa (112.5 psf) held for 10 seconds
Measured Permanent Set $_{Positive}$	= 5.11 mm (0.201 inches)
Measured Permanent Set $_{Negative}$	= 3.81 mm (0.150 inches)

NOTE: Deflection and Permanent Set measurements taken on the intermediate over a 2350 mm (92.5”) span.

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 E330 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.

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