



NATIONAL CERTIFIED TESTING LABORATORIES

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STRUCTURAL & IMPACT PERFORMANCE TEST REPORT

Report No: NCTL-110-10974-1
Test Date: 12/20/08
Report Date: 01/08/08
Expiration Date: 12/31/12

Client: Bovard Studio Inc.
2281 Highway 34 East
Fairfield, IN 52556

Tests Conducted: Florida Building Code 2004 TAS 201-94, "Impact Test Procedures"; Florida Building Code 2004 TAS 203-94, "Criteria for Testing Products Subjected to Cyclic Pressure Loading."

Design Pressures:

Specimen 1	(TAS-201/203)	Twin Shutter	+ 75 psf. - 75 psf.
Specimen 2	(TAS-201/203)	Twin Shutter	+ 75 psf. - 75 psf.
Specimen 3	(TAS-201/203)	Twin Shutter	+ 75 psf. - 75 psf.

TEST SPECIMEN DESCRIPTION

Model Designation: Bovard Studio, Inc.'s Series "Twin Shutter" Aluminum Fixed Shutter.

General: The test specimen was a twin fixed "shutter" aluminum prime window measuring 100-1/4" wide by 97-1/2" high overall. The fixed lites were glazed to the frame members, providing a viewing area of 45-5/16" wide by 93-3/16" high. An extruded aluminum angle measuring 2-1/4" x 2-1/4" x 3/16" was fastened to the buck and frame with evenly spaced #10 x 2" self tapping screws at the exterior frame perimeter. One (1) steel 2-3/4" x 1" mullion bar was fastened to the buck with four (4) screws and a metal mounting bracket. The fixed lites were fastened to the mullion with two (2) screws on 12" centers. The frame was of butt-type corner construction. Frame members were not thermally broken.

Glazing: The fixed lites were interior exterior glazed using 3/8" Lexan with a silicone back-bedding, an exterior glazing gasket, and a snap-in extruded aluminum glazing bead. The glazing bead was also secured to the frame using #10 x 2" self tapping screws on approximately 12" centers.

Weatherseals: No weatherseals employed.

Weeps: Six (6) vent holes measuring 7/16" x 3-1/4" were evenly spaced at the interior and exterior jamb faces.

Interior & Exterior Surface Finish: White painted aluminum..

Sealant: The frame corners were sealed with a silicone sealant. The exterior glazing perimeter were sealed with a silicone sealant.

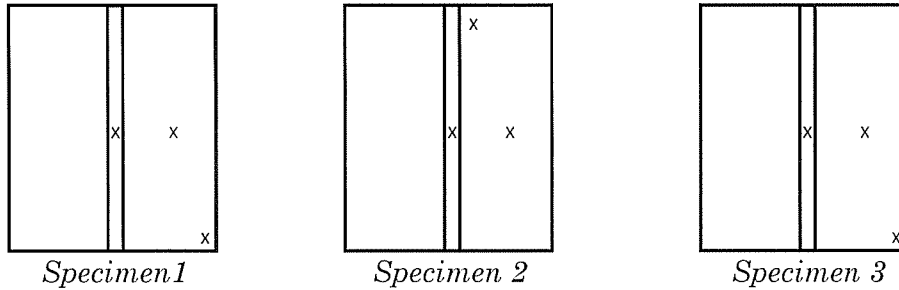
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Installation: The test specimen was installed into a 2" x 12" standard grade lumber test buck. The specimen was fastened to the buck via #10 x 2" self tapping screws located on approximately 12" centers through the aluminum angle, frame and glazing bead. The exterior perimeter was sealed with a silicone sealant.

LARGE MISSILE IMPACT TEST

Impact tests were conducted in accordance with TAS 201-94/ PA 201-94.

Type and weight of missile: #2 Southern Yellow Pine 2x4, Length 102" & 9 lbs.



Note: All impacts rejected the missile impacts without allowing penetration.

CYCLE TEST

Cycle tests were conducted in accordance with TAS 203-94/ PA 203-94.

Specimen 1

Design Pressure + 75 / - 75

Positive Loads

Range of test	Actual	# of cycles	Results
+ 0.0 to + 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

Negative Loads

Range of test	Actual	# of cycles	Results
- 0.0 to - 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
- 0.0 to - 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
- 0.0 to - 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

Specimen 2

Design Pressure + 75 / - 75

Positive Loads

Range of test	Actual	# of cycles	Results
+ 0.0 to + 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

Negative Loads

Range of test	Actual	# of cycles	Results
- 0.0 to - 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
- 0.0 to - 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
- 0.0 to - 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

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Specimen 3

Design Pressure + 75 / - 75

Positive Loads


Range of test	Actual	# of cycles	Results
+ 0.0 to + 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
+ 0.0 to + 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

Negative Loads

Range of test	Actual	# of cycles	Results
- 0.0 to - 0.5	0.0 - 37.5 psf	600	1.5 Seconds/Passed 40 /Min
- 0.0 to - 0.6	0.0 - 42.0 psf	70	1.5 Seconds/Passed 40 /Min
- 0.0 to - 1.3	0.0 - 97.5 psf	1	1.5 Seconds/Passed 40 /Min

Disclaimer: This test report was prepared by National Certified Testing Laboratory (NCTL), for the exclusive use of the above named client; it does not constitute certification of this product. The results are for that particular specimen tested and does not imply the quality of similar or identical products manufactured or installed from specifications identical to the tested product. 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.

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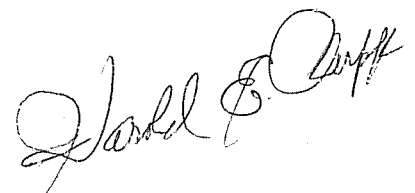
Jay Leader 

JAY LEADER
Technician



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

JLB/akl



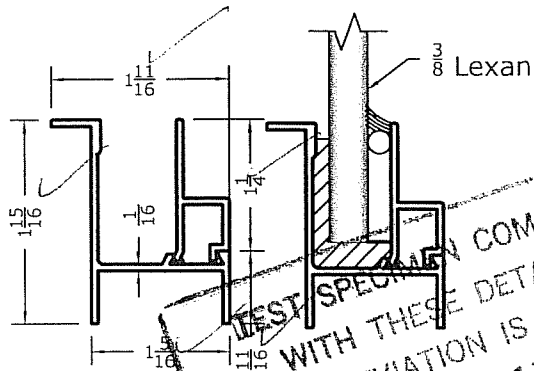
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**1770 SERIES
 LEXAN HURRICANE MODEL**

Perimeter Frame



TEST SPECIMEN COMPLIES WITH THESE DETAILS. ANY DEVIATION IS NOTED. REPORT NO. NCTL-110-10741-2.2 TEST DATE 12/07

Alum. Mullion Bracket for Steel Mullion

