NCTL

NATIONAL CERTIFIED TESTING LABORATORIES

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NCTL Report No.: *210-3198-1*
Test Date: *08/30/05*
Report Date: *09/08/05*

NCTL Certification No.: *03-0514.11*

Test Requested By - *Gallina USA, LLC.*
245 E Madison Avenue
Milton, WI 53563

Tests Conducted: *Dade County Building Code Compliance Office Protocol TAS 201-94, Impact Test Procedures. Dade County Building Code Compliance Office, TAS 202-94, "Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components using Uniform Static Air Pressure." Dade County Building Code Compliance Office TAS 203-94, "Criteria for Testing Products Subjected To Cyclic Pressure Loading."*

Design Pressures:

Specimen 1	*TAS 202 Structural Only*	*+ 80.0 psf Positive*	*-80.0 psf Negative*
Specimen 2	*TAS 201,203*	*+ 80.0 psf Positive*	*-80.0 psf Negative*
Specimen 3	*TAS 201,203*	*+ 80.0 psf Positive*	*-80.0 psf Negative*
Specimen 4	*TAS 201,203*	*+ 80.0 psf Positive*	*-80.0 psf Negative*

LARGE MISSILE DATA:	*2 x 4 Southern Yellow Pine (S4S)*
Length:	*7'-8"*
Weight:	*9.25 lbs.*
Velocity:	*34 mph - 50 ft. per second*

DESCRIPTION OF UNIT:

Model Designation – *25 mm Hurricane Storm Panel R.D.C.*

Overall Size - *48.0" wide x 96.0" high.*

Configuration - *X*

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MATERIAL CHARACTERISTICS:

Main Frame & Sash Construction: *The specimen tested was a 16mm hurricane storm panel, which consisted of one (1) sheet of cross-fluted polycarbonate. The overall dimensions were 48" wide x 96" high x 1.00" thick. Both interior and exterior skin walls measured 0.030" in thickness. The interior fluted walls, measured 0.010" in thickness.*

Glazing: *N/A*

Glazing Material: *N/A*

Weather seals: *N/A*

Hardware: *N/A*

Weep Holes: *N/A*

Insect Screen: *N/A*

Reinforcement: *N/A.*

Interior & Exterior Surface Finish: *The interior and exterior surface finish was translucent plastic.*

Sealant: *N/A*

Installation: *Each hurricane storm panel was installed into the test buck with twenty-two (22) 0.25"/20 x 3.50" Tapcon S.G. Anchors with one (1) 0.25" washer and one (1) washer/wing nut each; three (3) on each jamb and eight (8) at the head and sills. They were located 6" from each corner and 14" on center on the head and sills. On the jambs 6" from each end mid-span.*

SEQUENCE OF TESTS PERFORMED:

Test Sequence: TAS 202

1. *1/2 Test Pressure Positive*
2. *1/2 Test Pressure Negative*
3. *Design Pressure Positive*
4. *Design Pressure Negative*
5. *Full Test Pressure Positive*
6. *Full Test Pressure Negative*

STATIC AIR PRESSURE TEST

Static Tests were conducted in accordance with TAS 202

Specimen #1 *ASTM E 330*

Design Pressure *+ 80.0 psf, -80.0 psf*

Positive Loads	*Time (Sec.)*	*psf Load*	*Perm. Set Measured*		*Perm. Set Allowed*	
			Loc. # 1	*Loc. # 2*	*Loc. # 1*	*Loc. # 2*
1/2 Test Load	*30*	*60.00*				
Design Load	*30*	*80.00*				
Test Load	*30*	*120.00*	*0.011"*	*0.049"*	*0.056"*	*0.072"*

Negative Loads	*Time (Sec.)*	*psf Load*	*Perm. Set Measured*		*Perm. Set Allowed*	
			Loc. # 1	*Loc. # 2*	*Loc. # 1*	*Loc. # 2*
1/2 Test Load	*30*	*60.00*				
Design Load	*30*	*80.00*				
Test Load	*30*	*120.00*	*0.006"*	*0.028"*	*0.056"*	*0.072"*

Location # 1 – Center between fasteners at the head
Location # 2 – Center between fasteners

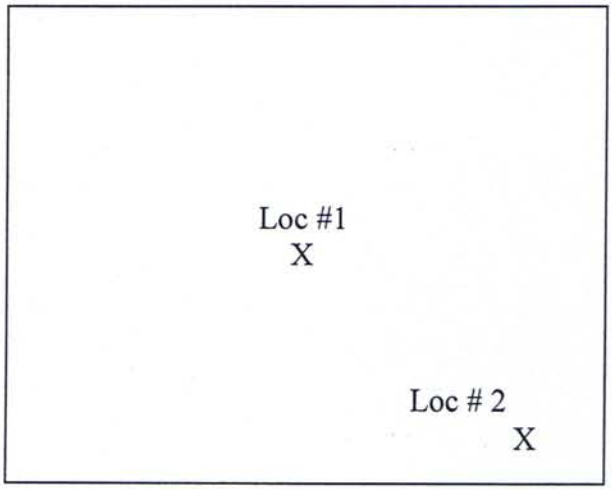
Location # 1 – Maximum Allowable Permanent Set (0.4% x 14" = 0.056")
Location # 2 - Maximum Allowable Permanent Set (0.4% x 18" = 0.072")

* *No breakage or permanent damage occurred*

LARGE MISSILE IMPACT TEST

Impact tests were conducted in accordance with TAS 201-94

Specimen # 2

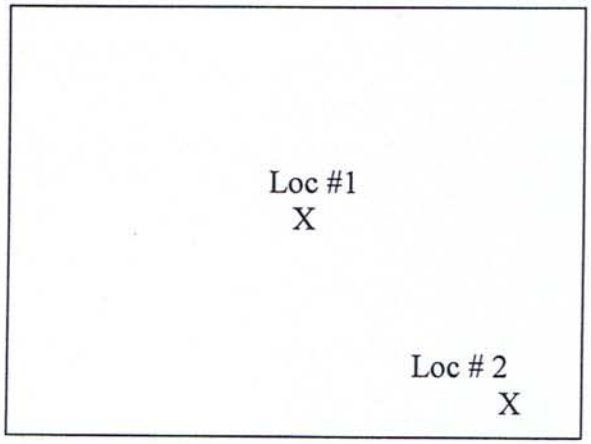


Location # 1: Center of Panel.

Location # 2: Bottom Right Corner of Panel.

Description of specimens after impact test: There was no penetration

Specimen # 3
Error!



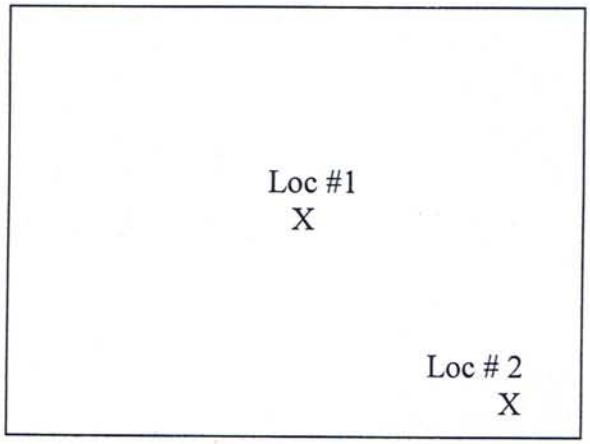
Location # 1: Center of Panel.

Location # 2: Bottom Right Corner of Panel

Description of specimens after impact test: There was no penetration

LARGE MISSILE IMPACT TEST (Cont'd)

Specimen # 4



Location # 1: Center of Active Sash

Location # 2 Bottom Right Corner of Panel

Description of specimens after impact test: There was no penetration

CYCLE TEST

Cycle tests were conducted in accordance with TAS 203-94

Specimen 2

Design Load psf *+ 80.0 psf - 80.0psf*

Range of test Positive loads	*Actual load psf*	*# of cycles*	*cycles/min*
+ .2 - .5	*16.0 - 40.0*	*3500*	*40*
+ .0 - .6	*0.00 - 48.0*	*300*	*40*
+ .5 - .8	*40.0 - 64.0*	*600*	*40*
+ .3 - 1.0	*24.0 - 80.0*	*100*	*40*

Range of test Negative loads	*Actual load psf*	*# of cycles*	*cycles/min*
- .3 - 1.0	*24.0 - 80.0*	*50*	*40*
- .5 - .8	*40.0 - 64.0*	*1050*	*40*
- .0 - .6	*00.0 - 48.0*	*50*	*40*
- .2 - .5	*16.0 - 40.0*	*3350*	*40*

9000 cycles completed

Description of specimen after cycle test:

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners or separation from the frame.

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CYCLE TEST (Cont'd)

Specimen 3

Design Load psf	+ 80.0 psf - 80.0psf		
+ .2 - .5	16.0 - 40.0	3500	40
+ .0 - .6	0.00 - 48.0	300	40
+ .5 - .8	40.0 - 64.0	600	40
+ .3 - 1.0	24.0 - 80.0	100	40

Range of test Negative loads	Actual load psf	# of cycles	cycles/min
- .3 - 1.0	24.0 - 80.0	50	40
- .5 - .8	40.0 - 64.0	1050	40
- .0 - .6	00.0 - 48.0	50	40
- .2 - .5	16.0 - 40.0	3350	40

9000 cycles completed

Description of specimen after cycle test:

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners or separation from the frame.

Specimen 4

Design Load psf	+ 80.0 psf - 80.0 psf		
+ .2 - .5	16.0 - 40.0	3500	40
+ .0 - .6	0.00 - 48.0	300	40
+ .5 - .8	40.0 - 64.0	600	40
+ .3 - 1.0	24.0 - 80.0	100	40

Range of test Negative loads	Actual load psf	# of cycles	cycles/min
- .3 - 1.0	24.0 - 80.0	50	40
- .5 - .8	40.0 - 64.0	1050	40
- .0 - .6	00.0 - 48.0	50	40
- .2 - .5	16.0 - 40.0	3350	40

9000 cycles completed

Description of specimen after cycle test:

Specimen showed no resultant failure or duress after cycle test. No failure of fasteners or separation from the frame.

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.

Detailed drawings were available for laboratory records and compared to the test specimens at the time of this report. A copy of this report along with representative sections of the test specimens will be retained by NCTL for a period of four (4) years. The results obtained apply only to the specimens tested. No conclusions of any kind regarding the adequacy or inadequacy of the glass in the test specimens may be drawn from this test. This report does not constitute certification of the product, which may only be granted by a certification program validator.

Observers –

Mr. Christopher Bennett (NCTL)
Mr. Daniel Ocasio (NCTL)
Mr. Ricky Moffett (NCTL)
Mr. Miguel Nieves (NCTL)
Mr. Frank Meints (Gallina USA. LLC).
Mr. Gerry Ferrara (P.E.)

Dade County Witness: None Present

NATIONAL CERTIFIED TESTING LABORATORIES

Daniel Ocasio
Laboratory Technician

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DO/do

Laboratory Compliance Letter

Laboratory Certification No: *03-0514.11*

To Whom It May Concern,

On August 30th, 2005, Gillina USA.LLC started testing at National Certified Testing Laboratories in Orlando, FL. All tests were performed in full accordance with all Dade County requirements with no deviations.

Test Report No.	***Product Series Description***
NCTL 210-3198-1	*25mm Hurricane Storm Panel R.D.C.*

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