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 ETC Certification # 99-0416.01
 Test Start Date: October 17, 2001
 Test End Date: October 19, 2001

Test Requested By: THERMA-TRU CORP
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Model Designation "Smooth Star" Series Opaque Fiberglass Door

Configuration Tested 8'4 x 8'0 Double W / Sidelites, Out-swing / In-swing

Tests Conducted: PA 202 (with no deviations)

Design Pressures

Specimens	1, 2 & 3	(PA 202)	Out-swing	+ 47.0 psf.	- 47.0 psf.
Specimen	4	(PA 202)	In-swing	+ 47.0 psf.	- 47.0 psf.
Specimens	1A, 2A & 3A	(PA 202)	Out-swing	+ 60.0 psf.	- 60.0 psf.
Specimen	4A	(PA 202)	In-swing	+ 60.0 psf.	- 60.0 psf.

Specimens 1A, 2A, 3A and 4A utilized surface bolts on the active door panel to achieve the higher design pressure rating.

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Section 1 - DESCRIPTION OF SERIES:

Model Designation "Smooth Star" Series Opaque Fiberglass Door (OXXO)

Overall Size

<u>Specimens</u>	<u>Threshold</u>	<u>Overall Test Unit Dimensions</u>		
		<u>Width (in.)</u>	<u>Height (in.)</u>	<u>Depth (in.)</u>
1, 2 & 3	Out-swing Bumper	105.50	96.50	4.5625
4	In-swing Saddle	105.50	98.00	4.5625

Configuration All Specimens (OXXO)

No. & Size of Doors:

<u>All Specimens</u>		
	1 active leaf -	36.0 in. wide x 95.25 in. high x 1.68 in. thick
	1 inactive leaf w/astragal -	36.625 in. wide x 95.25 in. high x 1.68 in. thick
Out-swing -	2 fixed sidelite panels -	13.9375 in. wide x 95.0 in. high x 1.68 in. thick
In-swing -	2 fixed sidelite panels -	13.9375 in. wide x 95.25 in. high x 1.68 in. thick

Section 2 - MATERIAL CHARACTERISTICS:

Frame and Door & Sidelite Material: Finger jointed pine jambs and steel panels.

Frame Construction -

The head jambs and side jambs are finger jointed pine measuring 4.5625 in. x 1.211 in.. The head jamb and side jambs are mortised, butted and joined using (3) #8 x 2.5 in. Phillips flat head wood screws at each end. The following thresholds were tested, specimens 1, 2, & 3 - Therma-Tru Aluminum Out-swing Bump measuring 4.615 in. x .837 in. and attached to the jamb with (2) #8 x 2.5 in. Phillips flat head wood screws at each end. Specimens 1, 2 and 3 were affixed with an add-on high dam sill that increased the height of the original bump threshold to 1.875 in. at the inner most plane of the frame system and tested to a higher water pressure (the high dam threshold was made from a piece of pine and added to the standard bump threshold to increase the height). Specimen 4 used a Therma-Tru self-adjusting In-swing saddle threshold (Alum/Wood/Vinyl) measuring 5.75 in. x 1.548 in. and attached to the jamb with (2) #8 x 2.5 in. Phillips flat head wood screws at each end. The hinge jambs were mortised to receive (8 total, 4 each side) Therma-Tru 4.0 in. x 4.0 in. self-locating hinges located at 6.125 in., 31.625 in., 57.125 in. and 82.625 in. from the top of the door jamb on each hinge jamb.

The sidelite head jamb, sill jamb and side jambs are finger-jointed pine measuring 4.565 in. x 1.211 in.. The four jamb pieces were assembled as a box construction when used in the out-swing configuration. The head jamb, sill jamb and side jambs are mortised, butted and joined using (3) #8 x 2.5 in. Phillips flat head wood screws at each corner butt joint. The in-swing model utilized a (Alum/Wood/Vinyl) saddle in-swing threshold measuring 5.75 in. x 1.548 in. and attached to the jamb with (2) #8 x 2.5 in. Phillips flat head wood screws at each end. Each of the sidelite jamb sets was secured to the doorjamb with (6) # 8 x 2.0 in. Phillips flat head wood screws located at 6.0 in., 23.0 in., 40.0 in., 57.0 in., 74.0 in. and 90.5 in. from the top of the head jamb through the doorstop into the sidelite jamb and into the sidelite.

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Panel Construction -

The door panel skins are constructed from 0.110 in. thick sheet molding compound (SMC). The interior cavity of each door is filled with 1.9 lbs. density BASF polyurethane foam. The face sheets are adhesively bonded to the wood stiles and rails. The latch stile measures 3.85 in. wide x 1.46 in. deep laminated lumber with a 0.336 in. wide x 1.185 in. deep pine cap and the hinge stile measures 1.2175 in. wide x 1.46 in. deep finger jointed pine. The top rail measures 0.92 in. thick x 1.46 in. deep wood composite and the bottom rail measures 1.09 in. thick x 1.46 in. wide wood composite. The bottom rail is kerfed to receive a door sweep (the sweep is used on in-swing models only). The hinge stile was mortised at 5.25 in., 30.75 in., 56.25 in. and 81.75 in. from the top of the door panel to receive (4) Thermo-Tru 4.0 in. x 4.0 in. butt type hinges. The inactive door panel was affixed with an extruded aluminum astragal (6060 T6 alloy) kerfed to receive weather-stripping. The astragal has integral extruded channels to receive (2) cold rolled steel rods at the top and (2) cold rolled steel rods at the bottom. The rods are 0.312 in. in diameter x 8.0 in. long at the bottom and 17.0 in. long at the top. The bolts extended 2.0 in. past the end of the astragal providing approximately 1.875 in. of engagement into the head and sill of the frame system. The astragal is attached to the inactive door panel with (9) # 8 x 1.0 in. Phillips pan head wood screws, located at 1.0 in., 3.0 in., 5.0 in., 18.25 in., 54.0 in., 77.0 in., 90.25 in., 92.25 in., and 94.25 in. from the top.

Sidelite Construction -

The sidelite sash skins are constructed from 0.070 in. thick sheet molding compound (SMC). The interior cavity of each sidelite is filled with 1.9 lbs. density BASF polyurethane foam. The face sheets are adhesively bonded to the wood stiles and rails. The side stiles measure 1.54 in. thick x 0.67 in. wide finger jointed pine. The top & bottom finger-jointed pine rails measure 1.54 in. thick x 0.67 in. high. The sidelite sashes were secured to the wood jambs with (12) # 8 x 2.0 in. Phillips flathead wood screws, (4) on each vertical side jamb located at 13.5 in., 31.0 in., 48.5 in. and 66.0 in. from the top and (2) on each of the head and sill jambs located at 4.0 in. from each end. The sash was stopped in with a nominal 3/8 in. cove molding around the perimeter. The cove molding was secured using 1.0 in. x 0.04 in. diameter wire brads at 2.0 in. from each end a maximum of 12.0 in. on center. The in-swing model used an extruded vinyl boot that was attached to the bottom of the sidelite sash with (3) # 6 x 1.0 in. Phillips pan head wood screws 2.0 in. from each end and (1) in the center.

Glazing:

Sidelite Panels

Specimens 1 & 2 - 2 sashes each consisting of the Thermo-Tru SMC Lip Lite (Bug verified)
left sash - (0.5 in. ins. glass - 0.125 in. tempered glass - 0.25 in. air space - 0.125 in. tempered glass)
right sash - (1.0 in. ins. glass - 0.125 in. tempered glass - 0.75 in. air space - 0.125 in. tempered glass)

Specimens 1 & 2 - SMC Lip lite OA size is 9.85 in. wide x 81.75 in. high secured with (16) # 8 x 1.75 in. Phillips Pan Head screws spaced as follows, top and bottom rail at 2.625 in. from each end, side stiles from the top down at 2.625 in., 18.0 in., 33.25 in., 48.5 in. and 63.875 in. and 79.125 in.. The frames were sealed with silicone caulking (Dow 795) to the sidelite panel and to the glass.

Specimen 3 - PVC Lip lite OA size is 9.85 in. wide x 81.75 in. high secured with (16) # 6 x 1.75 in. long Phillips Pan Head screws spaced as follows, top and bottom rail at 2.625 in. from each end, side stiles from the top down at 2.625 in., 18.0 in., 33.25 in., 48.5 in. and 63.875 in. and 79.125 in.. The frames were sealed with silicone caulking (Dow 795) to the sidelite panel and to the glass.

Specimens 4 - Integral Flush Glazed - The sidelite sash face panels are molded to receive the insulated glass. The glass is attached to the sidelite face sheets with silicone glazing compound (Dow 795).

Daylight Opening:

Specimens 1 & 2	Sidelite - SMC lip lite – 7.125 in. x 79.0 in. (0.5 in. glass bite)
Specimen 3	Sidelite - PVC lip lite – 7.125 in. x 79.0 in. (0.5 in. glass bite)
Specimen 4	Sidelite – Integral flush glazed – 7.0 in. x 80.9375 in. (0.5 in. glass bite)

Weather-stripping:

All Specimens	Head Jamb 1 pc Therma-Tru long reach foam compression weather-strip. Hinge Jambs 1 pc Therma-Tru short reach foam compression weather-strip. Astragal 1 pc Therma-Tru long reach foam compression weather-strip. Corner pad seals 3 – 1 at each hinge jamb and astragal at threshold
Specimens 1, 2 & 3 Specimen 4 -	At threshold 1 row Therma-Tru long reach foam compression weather-strip Therma-Tru vinyl fixed door bottom sweep.

Hardware:

All Specimens

- (1) Kwikset 700 Series Latch bolt (ANSI Grade II) at 60.0 in. from top of panel
(The strike plate was attached through the astragal with (2) #8 x 2.5 in. PFH WS.)
- (1) Kwikset 700 Deadbolt (ANSI Grade II) at 44.0 in. from top of panel
(The strike plate was attached through the astragal with (2) #8 x 2.5 in. PFH WS.)
- (8) Therma-Tru 4 in. butt type hinges
(The hinge was fastened to the door panel with (4) #10 x 0.75 in. PFH WS and fastened to the jamb with (3) #10 x 0.75 in. PFH WS and (1) # 10 x 2.0 in. PFH WS.)

Specimens 1A, 2A, 3A and 4A

- (2) Ives No. 454, 8.0 in. Surface Bolt with strike located at the top and bottom of the active panel at 2.5 in. centerline from the latch stile edge. (The strikes for each bolt were attached to the jamb and threshold with (2) # 8 x 2.5 in. PFH WS. The surface bolts were attached to the active door panel with (4) 10-24 sex bolts.)

Weepholes: None**Muntins:** None**Reinforcement:** None**Sealant:** Latex caulking as needed to seal unit into rough opening.**Additional Description:**

All specimens were installed in a wood test buck.

Section 3 - INSTALLATION:**Screws and Method of Attachment:**

Specimens 1, 2, 3 & 4 used the following screw types and numbers to secure the frame system into the test buck.

40 - # 8 x 2.5 in. Flat Head Phillips wood screws.

(28) – (14) head & (14) sill from the left side of the test specimen the screws are located at 3.0 in., 10.0 in., 13.0 in., 18.75 in., 21.75 in., 34.5 in., 50.0 in., 56.0 in., 71.5 in., 84.0 in., 87.0 in., 93.0 in., 96.0 in. and 102.5 in..

(12) – (6 ea sidelite jamb) from the top down on the left side of the test specimen the screws are located at 6.0 in., 23.0 in., 40.0 in., 57.0 in., 74.0 in. and 91.0 in..

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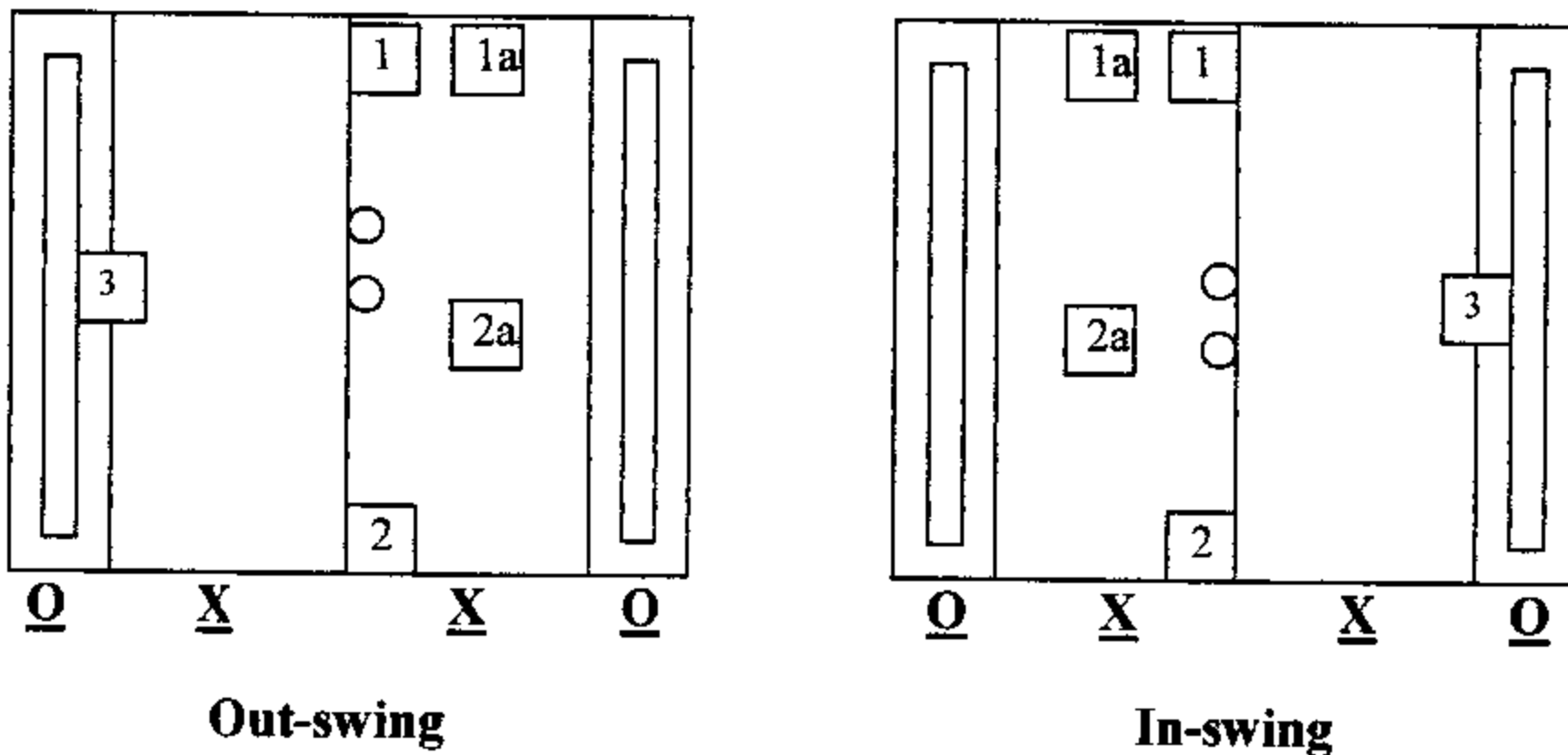
Section 4 - SEQUENCE OF TESTS PERFORMED:

Test Sequence: PA 202

- | | |
|--|---------------------------------|
| 1. Air Infiltration | 13. 1/2 Test Pressure Positive |
| 2. 75 MPH Wind Load Positive (single lock engaged) | 14. Design Pressure Positive |
| 3. 75 MPH Wind Load Negative (single lock engaged) | 15. 1/2 Test Pressure Positive |
| 4. 75 MPH Water Test | 16. Design Pressure Negative |
| 5. 1/2 Test Pressure Positive | 17. Water Infiltration Positive |
| 6. Design Pressure Positive | 18. Full Test Pressure Positive |
| 7. 1/2 Test Pressure Positive | 19. Full Test Pressure Negative |
| 8. Design Pressure Negative | 20. Forced Entry |
| 9. Water Infiltration Positive | |
| 10. Full Test Pressure Positive | |
| 11. Full Test Pressure Negative | |
| 12. Forced Entry | |

Note: Steps 13 through 20 were performed with a surface bolt engaged at the top latch stile and the bottom latch stile on the active door panel. The inactive panel was secured with the aluminum astragal integral bolts.

Deflection Gauges set at location #1, #2 & #3 (1a and 2a when surface bolts engaged)



Deflection was measured with three (3) Aerospace 2.0 in. dial indicators: location # 1-SN 213848, location # 2-SN 213233 and location # 3-SN 213701.

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TEST RESULTS: PA-202

Specimen 1 (Out-swing) Design Loads (psf) + 47.0 /- 47.0

AIR INFILTRATION

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.26	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
15% of 19.06 psf	15	2.86	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold.)
15% of 47.00 psf	15	7.05	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.461	
Structural Test	30	70.50	(3) Mullion	0.731	0.202
			(1) Door Top	0.528	0.119
			(2) Door Bottom	0.401	0.133

<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.463	
Structural Test	30	70.50	(3) Mullion	0.523	0.031
			(1) Door Top	2.500	0.129
			(2) Door Bottom	3.500	0.014

- (3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.
- (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.
- (1) Door Top - maximum allowable set at completion of test load (0.4% of span): 44.00 in. x .4% = 0.176 in.
- (2) Door Bottom - maximum allowable set at completion of test load (0.4% of span): 36.25 in. x .4% = 0.145 in.

FORCED ENTRY

<u>Size</u>		<u>Time (sec.)</u>	<u>Result</u>
<u>Width (in.)</u>	<u>Height (in)</u>		
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202**Specimen 1A (Out-swing with surface bolts on active panel)****Design Loads (psf) + 60.0 /- 60.0****AIR INFILTRATION**

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.26	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
75 MPH	15	2.16	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold and single lock engagement only, conducted after required 75 mph positive and negative test loads.)
15% of 60.00 psf	15	9.00	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold and all locks engaged.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.522	
Structural Test	30	90.00	(3) Mullion	0.822	0.000
			(1A) Door Top	0.361	0.033
			(2A) Door Ctr	2.370	0.188
<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.452	
Structural Test	30	90.00	(3) Mullion	0.697	0.063
			(1A) Door Top	0.401	0.054
			(2A) Door Ctr	1.807	0.089

(3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.

(3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.

(1A) Door Top - maximum allowable set at completion of test load (0.4% of span): 36.00 in. x .4% = 0.144 in.

(2A) Door Center - maximum allowable set at completion of test load (0.4% of span): 95.25 in. x .4% = 0.381 in.

FORCED ENTRY

<u>Width (in.)</u>	<u>Size</u>		<u>Time (sec.)</u>	<u>Result</u>
	<u>Height (in)</u>			
36.00	95.25		30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202

Specimen 2 (Out-swing)

Design Loads (psf) + 47.0 /- 47.0

AIR INFILTRATION

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.17	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
15% of 19.06 psf	15	2.86	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold.)
15% of 47.00 psf	15	7.05	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.421	
Structural Test	30	70.50	(3) Mullion	0.749	0.078
			(1) Door Top	0.427	0.034
			(2) Door Bottom	0.448	0.028

<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.425	
Structural Test	30	70.50	(3) Mullion	0.690	0.029
			(1) Door Top	2.750	0.064
			(2) Door Bottom	1.500	0.041

- (3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.
- (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.
- (1) Door Top - maximum allowable set at completion of test load (0.4% of span): 44.00 in. x .4% = 0.176 in.
- (2) Door Bottom - maximum allowable set at completion of test load (0.4% of span): 36.25 in. x .4% = 0.145 in.

FORCED ENTRY

<u>Width (in.)</u>	<u>Height (in)</u>	<u>Time (sec.)</u>	<u>Result</u>
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202**Specimen 2A (Out-swing with surface bolts on active panel)****Design Loads (psf) + 60.0 /- 60.0****AIR INFILTRATION**

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.17	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
75 MPH	15	2.16	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold and single lock engagement only, conducted after required 75 mph positive and negative test loads.)
15% of 60.00 psf	15	9.00	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold and all locks engaged.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.461	
Structural Test	30	90.00	(3) Mullion	0.718	0.034
			(1A) Door Top	0.408	0.046
			(2A) Door Ctr	1.773	0.152

<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.437	
Structural Test	30	90.00	(3) Mullion	0.765	0.017
			(1A) Door Top	0.367	0.006
			(2A) Door Ctr	0.944	0.027

(3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.
 (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.
 (1A) Door Top - maximum allowable set at completion of test load (0.4% of span): 36.00 in. x .4% = 0.144 in.
 (2A) Door Center - maximum allowable set at completion of test load (0.4% of span): 95.25 in. x .4% = 0.381 in.

FORCED ENTRY

<u>Width (in.)</u>	<u>Height (in)</u>	<u>Time (sec.)</u>	<u>Result</u>
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202

Specimen 3 (Out-swing)

Design Loads (psf) + 47.0 /- 47.0

AIR INFILTRATION

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.21	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
15% of 19.06 psf	15	2.86	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold.)
15% of 47.00 psf	15	7.05	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold.)

STATIC AIR PRESSURE


<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.397	
Structural Test	30	70.50	(3) Mullion	0.820	0.123
			(1) Door Top	0.114	0.000
			(2) Door Bottom	0.209	0.001

<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.344	
Structural Test	30	70.50	(3) Mullion	0.566	0.075
			(1) Door Top	2.056	0.031
			(2) Door Bottom	2.250	0.000

- (3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.
- (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.
- (1) Door Top - maximum allowable set at completion of test load (0.4% of span): 44.00 in. x .4% = 0.176 in.
- (2) Door Bottom - maximum allowable set at completion of test load (0.4% of span): 36.25 in. x .4% = 0.145 in.

FORCED ENTRY

<u>Size</u>		<u>Time (sec.)</u>	<u>Result</u>
<u>Width (in.)</u>	<u>Height (in)</u>		
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202**Specimen 3A (Out-swing with surface bolts on active panel)****Design Loads (psf) + 60.0 /- 60.0****AIR INFILTRATION**

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.21	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
75 MPH	15	2.16	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold and single lock engagement only, conducted after required 75 mph positive and negative test loads.)
15% of 60.00 psf	15	9.00	No water penetration over sill. (Achieved with add-on riser to the standard aluminum out-swing bump threshold and all locks engaged.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.428	
Structural Test	30	90.00	(3) Mullion	0.874	0.012
			(1A) Door Top	0.289	0.047
			(2A) Door Ctr	1.273	0.126
<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.402	
Structural Test	30	90.00	(3) Mullion	0.603	0.050
			(1A) Door Top	0.273	0.044
			(2A) Door Ctr	1.208	0.011

(3) Mullion - maximum allowable deflection at design load (L / 180) 96.50 in. / 180 = 0.536 in.
 (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 96.50 in. x .4% = 0.386 in.
 (1A) Door Top - maximum allowable set at completion of test load (0.4% of span): 36.00 in. x .4% = 0.144 in.
 (2A) Door Center - maximum allowable set at completion of test load (0.4% of span): 95.25 in. x .4% = 0.381 in.

FORCED ENTRY

<u>Width (in.)</u>	<u>Height (in)</u>	<u>Time (sec.)</u>	<u>Result</u>
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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EST RESULTS: **PA-202**

Specimen 4 **(In-swing)** **Design Loads (psf) + 47.0 /- 47.0**

AIR INFILTRATION

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.29	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
15% of 19.06 psf	15	2.86	No water penetration over sill. (Achieved with standard aluminum saddle threshold.)

STATIC AIR PRESSURE

<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.400	
Structural Test	30	70.50	(3) Mullion	0.545	0.043
			(1) Door Top	3.100	0.059
			(2) Door Bottom	1.320	0.074

<u>Negative loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	35.25			
Design	30	47.00	(3) Mullion	0.450	
Structural Test	30	70.50	(3) Mullion	0.678	0.080
			(1) Door Top	0.617	0.000
			(2) Door Bottom	0.225	0.077

- (3) Mullion - maximum allowable deflection at design load (L / 180) 98.00 in. / 180 = 0.544 in.
- (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 98.00 in. x .4% = 0.392 in.
- (1) Door Top - maximum allowable set at completion of test load (0.4% of span): 44.00 in. x .4% = 0.176 in.
- (2) Door Bottom - maximum allowable set at completion of test load (0.4% of span): 36.25 in. x .4% = 0.145 in.

FORCED ENTRY

<u>Width (in.)</u>	<u>Size</u>		<u>Time (sec.)</u>	<u>Result</u>
	<u>Height (in)</u>			
36.00	95.25		30	Door remained locked & shut and was operable at the completion of the test.

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TEST RESULTS: PA-202

Specimen 4A (Out-swing with surface bolts on active panel)

Design Loads (psf) + 60.0 /- 60.0

AIR INFILTRATION

<u>Pressure</u> (psf)	<u>Actual</u> (CFM/SQ FT)	<u>Allowable</u> (CFM/SQ FT)
1.57	0.29	0.34

WATER INFILTRATION

	<u>Time</u> (min.)	<u>Pressure</u> (psf)	<u>Result</u>
75 MPH	15	2.16	No water penetration over sill. (Achieved with standard aluminum out-swing bump threshold and single lock engagement only, conducted after required 75 mph positive and negative test loads.)
15% of 19.06 psf	15	2.86	No water penetration over sill. (Achieved with standard aluminum saddle threshold.)

STATIC AIR PRESSURE

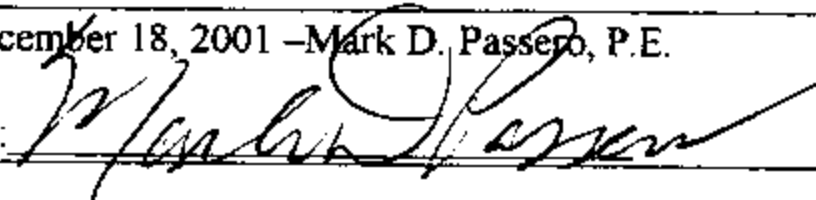
<u>Positive loads</u>	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.446	
Structural Test	30	90.00	(3) Mullion	0.625	0.025
			(1A) Door Top	0.313	0.063
			(2A) Door Ctr	1.875	0.188
<u>Negative loads</u>					
	<u>Time</u> (sec.)	<u>Pressure</u> (psf)	<u>Deflection and Permanent Set Measurements</u>		
			<u>Location</u>	<u>Deflection (in.)</u>	<u>Permanent Set (in)</u>
1/2 Test	30	45.00			
Design	30	60.00	(3) Mullion	0.450	
Structural Test	30	90.00	(3) Mullion	0.571	0.031
			(1A) Door Top	0.313	0.029
			(2A) Door Ctr	1.723	0.157

(3) Mullion - maximum allowable deflection at design load (L / 180) 98.00 in. / 180 = 0.544 in.
 (3) Mullion - maximum allowable set at completion of test load (0.4% of span): 98.00 in. x .4% = 0.392 in.
 (1A) Door Top - maximum allowable set at completion of test load (0.4% of span): 36.00 in. x .4% = 0.144 in.
 (2A) Door Center - maximum allowable set at completion of test load (0.4% of span): 95.25 in. x .4% = 0.381 in.

FORCED ENTRY

<u>Size</u>		<u>Time (sec.)</u>	<u>Result</u>
<u>Width (in.)</u>	<u>Height (in)</u>		
36.00	95.25	30	Door remained locked & shut and was operable at the completion of the test.

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Signature: 

Section 5 - DRAWINGS TO BE SUBMITTED:

1. L2173 sheets 1 through 13 of 13
2. Laboratory Anchoring sketches

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.

Observers:

Steve Kepler – Project Scientist, THERMA-TRU Corp.
Rick Wright – Consultant, R.W. Building Consultants, Inc.

Dade County Witness:

Not present

All Tests Witnessed by:

Mark D. Passero, P.E.
Arthur Murray, ETC Laboratories
Bill Yanda, ETC Laboratories

cc: THERMA-TRU CORP. (3)
Rick Wright (3)
File (1)

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Signature: 

Conditions, Terms, and General Notes Regarding These Tests

The product tested has been compared to the detailed drawings, bill of materials and fabrication information supplied by the client so named herein. Our analysis, which includes dimensional and component description comparisons, indicate the tested product and engineering information supplied by the client "**Are Equivalent**". The report and representative samples will be retained for four years from the date of initial test.

These test results were obtained by employing all requirements of the designated test methods with no deviations. The test results and specimen supplied for testing are in compliance with the referenced specifications.

The test results are specific to the product tested by this laboratory and of the sample supplied by the client named herein, and they relate to no other product either manufactured by the client, a Fabricator of the client or of installed field performance.


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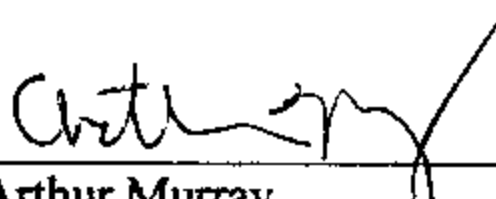
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For ETC Laboratories



Bill Yanda
Test Technician



Arthur Murray
Laboratory Manager
Wind Engineering Laboratory

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Signature: 