

Report No. ETC 01-741-11194.0
DC Notification Number ETC 01051
Date: October 22, 2001
ETC Certification # 99-0416.01
Test Start Date: September 10, 2001
Test End Date: September 15, 2001

Test Requested By: THERMA-TRU CORP
1687 Woodlands Drive
Maumee, Ohio 43537
Toll Free 800.537.8827
Phone 219.868.5811
Facsimile 219.868.5190

Model Designation – “Classic-Craft” Series Glazed Fiberglass Swing Door (OXXO)

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	+ 70.0 psf.	- 70.0 psf.
Specimen 4A	(PA 202)	In-swing	+ 70.0 psf.	- 70.0 psf.

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

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.

Signature: 

Section 1 - DESCRIPTION OF SERIES:

Model Designation - "Classic-Craft" Series Glazed Fiberglass Swing Door (OXXO)

Overall Size:

Specimens 1, 2 & 3 Out-swing Bumper Threshold - 105.5 in. W x 80.5 in. H x 4.5625 in. D
Specimens 4 In-swing Self-adjusting Threshold - 105.5 in. W x 82.0 in. H x 4.5625 in. D

Configuration: All Specimens (OXXO)

No. & Size of Doors:

All Specimens

1 active leaf - 36.0 in. wide x 79.25 in. high x 1.68 in. thick
1 inactive leaf w/ astragal - 36.625 in. wide x 79.25 in. high x 1.68 in. thick
Out-swing - 2 fixed sidelite panels - 13.9375 in. wide x 79.0 in. high x 1.68 in. thick
In-swing - 2 fixed sidelite panels - 13.9375 in. wide x 79.25 in. high x 1.68 in. thi

Section 2 - MATERIAL CHARACTERISTICS:

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

Frame Construction -

The head jambs and side jambs are finger jointed pine measuring 4.565 in. x 1.17 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 (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 (6 total, 3 each side) Therma-Tru 4.0 in. x 4.0 in. self-locating hinges located at 9.25 in., 38.5 in. and 67.75 in. from the top of the doorjamb on each hinge jamb.

The sidelite head jamb, sill jamb and side jambs are finger-jointed pine measuring 4.565 in. x 1.17 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 inswing model utilized a (Alum/Wood/Vinyl) saddle inswing 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., 19.75 in., 33.5 in., 47.25 in., 61.0 in. and 74.75 in. from the top of the head jamb through the doorstop into the sidelite jamb and into the sidelite.

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 Mark D. Passero, P.E.

Signature: 

Panel Construction -

The door panel skins are constructed from 0.105 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 1.47 in. thick x 4.03 in. wide laminated wood strand including the 0.30 in. oak cap and the hinge stile measures 1.47 in. thick x 1.46 in. wide laminated wood strand including the 0.39 in. oak cap. The top rail measures 1.47 in. thick x 0.874 in. high wood composite and the bottom rail measures 1.47 in. thick x 0.883 in. high 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 8.375 in., 37.625 in. and 66.875 in. from the top of the door panel to receive (3) Therma-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. 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., 40.5 in., 59.25 in., 74.25 in., 76.25 in., and 78.25 in. from the top.

Section 2 - MATERIAL CHARACTERISTICS Cont.:**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:

Door Panels

All Specimens – The in-active and active door panels were routed to receive a Therma-Tru SMC lip lite located 27.0 in. from the bottom of the panel. The lite was 27.5 in. wide x 50.19 in. high.

(1.0 in. insulated glass – 0.125 in. tempered glass – 0.75 in. air space - 0.125 in. tempered glass)

Sidelite Panels

Specimens 1 & 2 - 2 sashes each consisting of the Therma-Tru SMC Lip Lite

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)

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 – Mark D. Passero, P.E.

Signature: 

Section 2 - MATERIAL CHARACTERISTICS: **Cont.**

Glazing: **Cont.**

Specimen 3 - 2 sashes each consisting of the Therma-Tru TCM Lip Lite
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)

Specimen 4 - 2 sashes each consisting of the Therma-Tru Flush Glazing
left sash - (0.75 in. ins. glass – 0.125 in. tempered glass – 0.50 in. air space -0.125 in. tempered glass)
right sash -(1.0 in. ins. glass – 0.125 in. tempered glass – 0.50 in. air space -0.125 in. tempered glass)

Glazing Method:

Door Panels -

All Specimens, The SMC Lip lite OA size is 27.5 in. wide x 50.19 in. high secured with (16) # 8 x 1.75 in. Phillips Pan Head screws spaced as follows, top and bottom rail at 3.0 in., 13.75 in. and 24.5 in. from the left side. The side stile anchors were located at 3.0 in., 13.25 in., 23.625 in., 33.875 in. and 44.125 in. from the bottom of the lite frame. The frames were sealed with silicone caulking (Dow 795) to the sidelite panel and to the glass.

Sidelite Panels -

Specimens 1 & 2 – SMC Lip lite OA size is 9.85 in. wide x 65.85 in. high secured with (16) # 8 x 1.75 in. Phillips Pan Head screws spaced as follows, top and bottom rail at 2.125 in. from each end, side stiles from the top down at 5.5 in., 16.5 in., 27.5 in., 38.375 in. and 49.375 in. and 60.375 in.. The frames were sealed with silicone caulking (Dow 795) to the sidelite panel and to the glass.

Specimen 3 – TCM Lip lite OA size is 9.85 in. wide x 65.85 in. high secured with (16) # 6 x 1.75 in. long Phillips Pan Head screws spaced as follows, top and bottom rail at 2.125 in. from each end, side stiles from the top down at 5.5 in., 16.5 in., 27.5 in., 38.375 in. and 49.375 in. and 60.375 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:

All Specimens	Door Lite – SMC lip lite – 24.5 in. x 47.19 in. (0.5 in. glass bite)
Specimens 1 & 2	Sidelite - SMC lip lite – 7.125 in. x 63.0 in. (0.5 in. glass bite)
Specimen 3	Sidelite - TCM lip lite – 7.125 in. x 63.0 in. (0.5 in. glass bite)
Specimen 4	Sidelite – Integral flush glazed – 7.0 in. x 64.9375 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	At threshold 1 row Therma-Tru long reach foam compression weather-strip
Specimen 4 -	Therma-Tru vinyl fixed door bottom sweep.

Section 2 - MATERIAL CHARACTERISTICS: **Cont.**

Hardware:

All Specimens

- (1) Kwikset 700 Series Latch bolt (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.)
- (1) Kwikset 700 Deadbolt (ANSI Grade II) at 38.5 in. from top of panel
(The strike plate was attached through the astragal with (2) #8 x 2.5 in. PFH WS.)
- (6) 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., 19.75 in., 33.5 in., 47.25 in., 61.0 in. and 74.0 in..

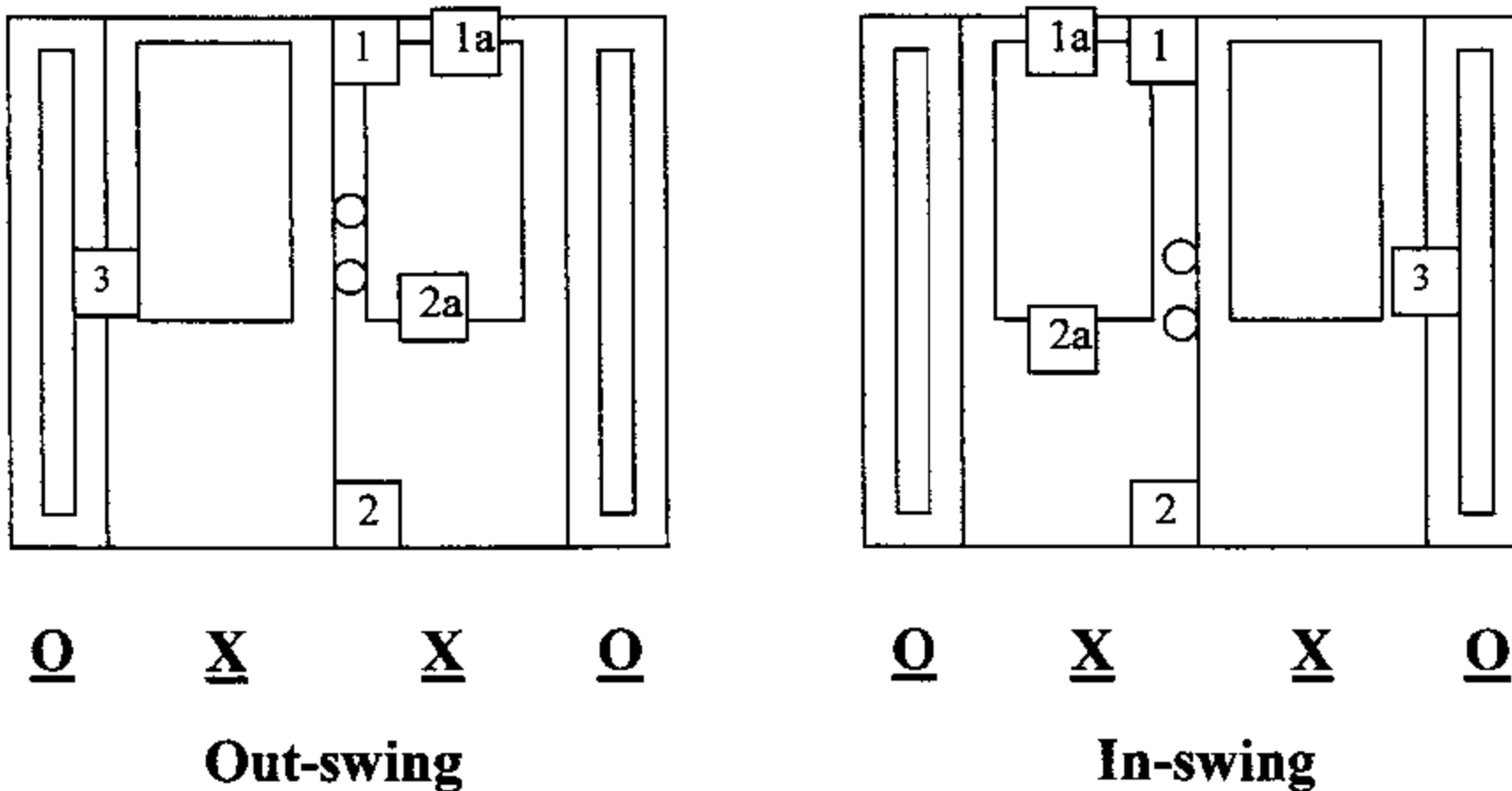
Section 4 - SEQUENCE OF TESTS PERFORMED:

Test Sequence: PA 202

- | | |
|--|---|
| <ol style="list-style-type: none"> 1. Air Infiltration 2. 75 MPH Wind Load Positive (single lock engaged) 3. 75 MPH Wind Load Negative (single lock engaged) 4. 75 MPH Water Test Positive 5. 1/2 Test Pressure Positive 6. Design Pressure Positive 7. 1/2 Test Pressure Negative 8. Design Pressure Negative 9. Water Infiltration Positive Direction 10. Full Test Pressure Positive 11. Full Test Pressure Negative 12. Forced Entry | <ol style="list-style-type: none"> 13. 1/2 Test Pressure Positive 14. Design Pressure Positive 15. 1/2 Test Pressure Negative 16. Design Pressure Negative 17. Water Infiltration Positive Direction 18. Full Test Pressure Positive 19. Full Test Pressure Negative 20. 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 two (3) Aerospace 2.0 in. dial indicators: location # 1-SN 213848, location # 2-SN 213233 and location # 3-SN 213701.

Air Infiltration Tests were conducted in accordance with DCBCCD PA 202-94

Water Infiltration Tests were conducted in accordance with DCBCCD PA 202-94

Static Tests were conducted in accordance with DCBCCD PA 202-94

Forced Entry Tests were conducted in accordance with DCBCCD PA202-94

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.

Signature: *Mark D. Passero*

Test Results:

Specimen 1: Out-swing (OXXO)

AIR INFILTRATION

Air at 1.57 psf	Actual	Allowable
	0.04 CFM/SQ FT	0.34 CFM/SQ FT

WATER INFILTRATION

75 MPH Water test No water penetration over sill.
(The 75 MPH water test was conducted after the required positive and negative 75 mph loads.)

Water @ 2.86 psf (15% of 19.0 psf) for 15 min. No water penetration over sill.
(Achieved with standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions.)

Water @ 7.05 psf (15% of 47.0 psf) for 15 min. No water penetration over sill.
(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the 2.86 psf test.)


Water @ 10.5 psf (15% of 70.0 psf) for 15 min. No water penetration over sill.
(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions with the surface bolts engaged.)

STATIC AIR PRESSURE

Design Loads + 47.0 psf, - 47.0 psf. (Out-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.289 in.	
Test	30	70.50	Mullion (3) 0.680 in.	Mullion (3) 0.215 in.
			Door T (1) 0.392 in.	Door T (1) 0.080 in.
			Door B (2) 0.398 in.	Door B (2) 0.130 in.
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.292 in.	
Test	30	70.50	Mullion (3) 0.860 in.	Mullion (3) 0.230 in.
			Door T (1) 1.750 in.	Door T (1) 0.108 in.
			Door B (2) 1.850 in.	Door B (2) 0.134 in.

Loc 3 Max. allowable deflection at design load (L / 180) 80.5 in. / 180 = 0.447 in.
 Loc 1 & 2 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.
 Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 80.5 in. = 0.322 in.

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.
 Signature: 

Test Results: Cont.**Specimen 1A: Out-swing (OXXO)****Static Air Pressure (with surface bolts active panel)****Design Loads + 70.0 psf, - 70.0 psf. (Out-swing)**

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	52.50		
Design	30	70.00	Mullion (3) 0.300 in.	
Test	30	105.00	Mullion (3) 0.858 in. Door T (1a) 0.409 in. Door M (2a) 1.005 in.	Mullion (3) 0.232 in. Door T (1a) 0.120 in. Door M (2a) 0.050 in.

Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	52.50		
Design	30	70.00	Mullion (3) 0.365 in.	
Test	30	105.00	Mullion (3) 0.780 in. Door T (1a) 0.930 in. Door M (2a) 1.100 in.	Mullion (3) 0.121 in. Door T (1a) 0.130 in. Door M (2a) 0.120 in.

Loc 3 Max. allowable deflection at design load ($L / 180$) $80.5 \text{ in.} / 180 = 0.447 \text{ in.}$

Loc 1a Max. allowable perm. set at completion of test load (0.4% of span) $.004 \times 36.0 \text{ in.} = 0.144 \text{ in.}$

Loc 2a Max. allowable perm. set at completion of test load (0.4% of span) $.004 \times 79.25 \text{ in.} = 0.317 \text{ in.}$

Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) $.004 \times 80.5 \text{ in.} = 0.322 \text{ in.}$

FORCED ENTRY**Specimen 1**

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Specimen 1A (surface bolts on active panel)

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.

Signature: 

Test Results: Cont.

Specimen 2: Out-swing (OXXO)

AIR INFILTRATION

Air at 1.57 psf	Actual	Allowable
	0.09 CFM/SQ FT	0.34 CFM/SQ FT

WATER INFILTRATION

75 MPH Water test No water penetration over sill.

(The 75 MPH water test was conducted after the required positive and negative 75 mph loads.)

Water @ 2.86 psf (15% of 19.0 psf) for 15 min. No water penetration over sill.

(Achieved with standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions.)

Water @ 7.05 psf (15% of 47.0 psf) for 15 min. No water penetration over sill.

(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the 2.86 psf test.)

Water @ 10.5 psf (15% of 70.0 psf) for 15 min. No water penetration over sill.

(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions with the surface bolts engaged.)

STATIC AIR PRESSURE

Design Loads + 47.0 psf, - 47.0 psf. (Out-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.261 in.	
Test	30	70.50	Mullion (3) 0.549 in.	Mullion (3) 0.112 in.
			Door T (1) 0.372 in.	Door T (1) 0.101 in.
			Door B (2) 0.359 in.	Door B (2) 0.122 in.
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.266 in.	
Test	30	70.50	Mullion (3) 0.616 in.	Mullion (3) 0.103 in.
			Door T (1) 2.250 in.	Door T (1) 0.157 in.
			Door B (2) 2.500 in.	Door B (2) 0.131 in.

Loc 3 Max. allowable deflection at design load (L / 180) 80.5 in. / 180 = 0.447 in.

Loc 1 & 2 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in.= 0.317 in.

Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 80.5 in.= 0.322 in.

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Rasserio, P.E.

Signature: 

Test Results: Cont.

Specimen 2A: Out-swing (OXXO)

Static Air Pressure (with surface bolts active panel)

Design Loads + 70.0 psf, - 70.0 psf. (Out-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	52.50		
Design	30	70.00	Mullion (3) 0.319 in.	
Test	30	105.00	Mullion (3) 0.700 in. Door T (1a) 0.424 in. Door M (2a) 1.175 in.	Mullion (3) 0.154 in. Door T (1a) 0.092 in. Door M (2a) 0.053 in.

Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	52.50		
Design	30	70.00	Mullion (3) 0.416 in.	
Test	30	105.00	Mullion (3) 0.900 in. Door T (1a) 0.772 in. Door M (2a) 1.154 in.	Mullion (3) 0.215 in. Door T (1a) 0.053 in. Door M (2a) 0.092 in.

- Loc 3 Max. allowable deflection at design load (L / 180) 80.5 in. / 180 = 0.447 in.
- Loc 1a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 36.0 in.= 0.144 in.
- Loc 2a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in.= 0.317 in.
- Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 80.5 in.= 0.322 in.

FORCED ENTRY

Specimen 2A

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Specimen 2A (surface bolts on active panel)

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.

Signature: 

Test Results: Cont.

Specimen 3: Out-swing (OXXO)

AIR INFILTRATION

Air at 1.57 psf	Actual	Allowable
	0.27 CFM/SQ FT	0.34 CFM/SQ FT

WATER INFILTRATION

75 MPH Water test No water penetration over sill.

(The 75 MPH water test was conducted after the required positive and negative 75 mph loads.)

Water @ 2.86 psf (15% of 19.0 psf) for 15 min. No water penetration over sill.

(Achieved with standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions.)

Water @ 7.05 psf (15% of 47.0 psf) for 15 min. No water penetration over sill.

(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the 2.86 psf test.)

Water @ 10.5 psf (15% of 70.0 psf) for 15 min. No water penetration over sill.


(Achieved with add-on riser to the standard aluminum out-swing bump threshold. This test was conducted at the conclusion of the required half test and design load in the positive and negative directions with the surface bolts engaged.)

STATIC AIR PRESSURE

Design Loads + 47.0 psf, - 47.0 psf. (Out-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.310 in.	
Test	30	70.50	Mullion (3) 0.485 in.	Mullion (3) 0.047 in.
			Door T (1) 0.480 in.	Door T (1) 0.168 in.
			Door B (2) 0.405 in.	Door B (2) 0.121 in.
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	35.25		
Design	30	47.00	Mullion (3) 0.250 in.	
Test	30	70.50	Mullion (3) 0.400 in.	Mullion (3) 0.076 in.
			Door T (1) 1.610 in.	Door T (1) 0.110 in.
			Door B (2) 1.390 in.	Door B (2) 0.163 in.

Loc 3 Max. allowable deflection at design load (L / 180) 80.5 in. / 180 = 0.447 in.
 Loc 1 & 2 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.
 Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 80.5 in. = 0.322 in.

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.
 Signature: 

Test Results: Cont.

Specimen 3A: Out-swing (OXXO)

Static Air Pressure (with surface bolts active panel)

Design Loads + 70.0 psf, - 70.0 psf. (Out-swing)

Range of test	time	actual load	deflection		perm. set	
Positive loads	(seconds)	psf				
1/2 Test	30	52.50				
Design	30	70.00	Mullion (3)	0.309 in.		
Test	30	105.00	Mullion (3)	0.790 in.	Mullion (3)	0.120 in.
			Door T (1a)	0.413 in.	Door T (1a)	0.117 in.
			Door M (2a)	0.800 in.	Door M (2a)	0.072 in.

Range of test	time	actual load	deflection		perm. set	
Negative loads	(seconds)	psf				
1/2 Test	30	52.50				
Design	30	70.00	Mullion (3)	0.360 in.		
Test	30	105.00	Mullion (3)	0.679 in.	Mullion (3)	0.012 in.
			Door T (1a)	0.359 in.	Door T (1a)	0.020 in.
			Door M (2a)	0.694 in.	Door M (2a)	0.019 in.

- Loc 3 Max. allowable deflection at design load (L / 180) 80.5 in. / 180 = 0.447 in.
- Loc 1a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 36.0 in.= 0.144 in.
- Loc 2a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in.= 0.317 in.
- Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 80.5 in.= 0.322 in.

FORCED ENTRY

Specimen 1

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Specimen 1A (surface bolts on active panel)

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 - Mark D. Passero, P.E.

Signature: 

Test Results: Cont.

Specimen 4A: In-swing (OXXO)

Static Air Pressure (with surface bolts active panel)

Design Loads + 70.0 psf, - 70.0 psf. (In-swing)

Range of test	time	actual load	deflection		perm. set	
Positive loads	(seconds)	psf				
1/2 Test	30	52.50				
Design	30	70.00	Mullion (3)	0.374 in.		
Test	30	105.00	Mullion (3)	0.770 in.	Mullion (3)	0.150 in.
			Door T (1a)	0.190 in.	Door T (1a)	0.115 in.
			Door M (2a)	1.250 in.	Door M (2a)	0.050 in.

Range of test	time	actual load	deflection		perm. set	
Negative loads	(seconds)	psf				
1/2 Test	30	52.50				
Design	30	70.00	Mullion (3)	0.320 in.		
Test	30	105.00	Mullion (3)	0.710 in.	Mullion (3)	0.145 in.
			Door T (1a)	0.350 in.	Door T (1a)	0.117 in.
			Door M (2a)	1.003 in.	Door M (2a)	0.112 in.

Loc 3 Max. allowable deflection at design load (L / 180) 82.0 in. / 180 = 0.456 in.

Loc 1a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 36.0 in. = 0.144 in.

Loc 2a Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.

Loc 3 Max. allowable perm. set at completion of test load (0.4% of span) .004 x 82.0 in. = 0.328 in.

FORCED ENTRY

Specimen 1

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Specimen 1A (surface bolts on active panel)

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 79.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

Section 5 - DRAWINGS TO BE SUBMITTED:

1. L2161 sheets 1 through 18 of 18
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)

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 – Mark D. Passero, P.E.

Signature: 

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.

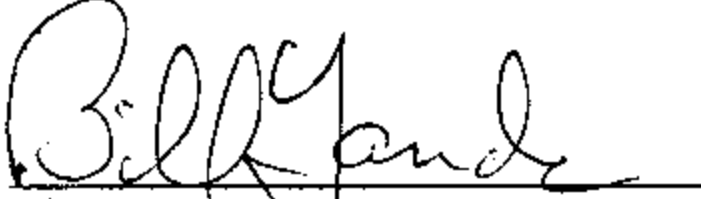
This report does not constitute an AAMA, NWWDA or Dade County certified product under the certification programs of these organizations. The program administrator of these programs and organizations may only grant product certification.


ETC Laboratories makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of ETC Laboratories.

ETC Laboratories letters, reports, it's name or insignia or mark are for the exclusive use of the client so named herein and any other use is strictly prohibited. The report, letters and the name of ETC Laboratories, its seal or mark shall not be used in any circumstance to the general public or in any advertising.

Limitation of Liability: Due diligence was used in rendering this professional opinion. By acceptance of this report, this client agrees to hold harmless and indemnify ETC Laboratories, it's employees and offices and owners against all claims and demands of any kind whatsoever, which arise out of or in any manner connected with the performance of work referred to herein. ETC laboratories reserves the right to subcontract any and all work for its clients in order to fulfill its contractual obligations for testing to these standards.

For ETC Laboratories


Bill Yanda
Test Technician


Arthur Murray
Laboratory Manager
Wind Engineering Laboratory

Florida Registered Professional Engineers Review: Reg. # 53786, October 22, 2001 --Mark D. Passero, P.E.

Signature: 