

Report No. ETC 01-741-10701.0
DC Notification Number ETC 01019
Date: August 6, 2001
ETC Certification # 99-0416.01
Test Start Date: May 17, 2001
Test End Date: May 18, 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

Tests Conducted: PA 202 (with no deviations)

<u>Design Pressures</u> - Specimen 1	(PA 202)	Out-swing	+ 70.0 psf.	- 70.0 psf.
Specimens 2 & 3	(PA 202)	Out-swing	+ 67.0 psf.	- 67.0 psf.
Specimen 4	(PA 202)	In-swing	+ 67.0 psf.	- 67.0 psf.

Section 1 - DESCRIPTION OF SERIES:

Model Designation - "Smooth Star" Series Opaque Fiberglass Swing Door

Overall Size:

Specimens 1, 2 & 3 Out-swing Bumper Threshold - 37.5 in. W x 96.5 in. H x 4.5625 in. D
Specimen 4 In-swing Self-adjusting Threshold - 37.5 in. W x 98.0 in. H x 4.5625 in. D

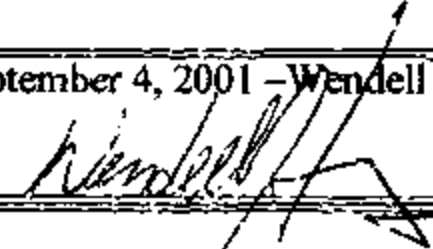
Configuration: All Specimens (X)

No. & Size of Doors:

All Specimens 1 active leaf - 36.0 in. wide x 95.25 in. high x 1.68 in. thick

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Section 2 - MATERIAL CHARACTERISTICS:**Frame and Door Material:** Finger jointed pine jambs and steel 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) 0.5 in. crown x 2 in. 16 ga. wire staples 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) 0.5 in. crown x 2.5 in. 16 ga. wire staples 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) 0.5 in. crown x 2.5 in. 16 ga. wire staples at each end. The hinge jamb was mortised to receive (4) 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.

Panel Construction -

The door panel skins are constructed from 0.070 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 3.670 in. wide x 1.54 in. deep laminated lumber with a 0.354 in. wide x 1.32 in. deep pine cap and the hinge stile measures 1.20 in. wide x 1.54 in. deep finger jointed pine. The top rail measures 0.91 in. thick x 1.54 in. deep wood composite and the bottom rail measures 0.89 in. thick x 1.54 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) Therma-Tru 4.0 in. x 4.0 in. butt type hinges. The 4.0 in. latch stile utilized no additional reinforcement for the lock hardware.

Sash Construction - NA**Glazing:** NA**Glazing Method:** NA**Daylight Opening:** NA**Weather-stripping:**

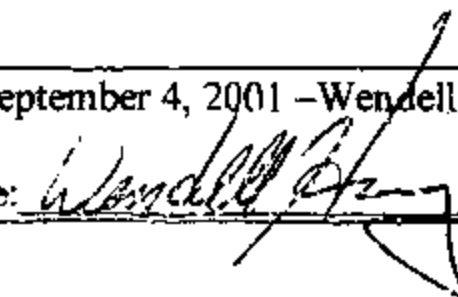
All Specimens Latch Jamb 1 pc Therma-Tru long reach foam compression weather-strip.
 Head Jamb 1 pc Therma-Tru long reach foam compression weather-strip.
 Hinge Jamb 1 pc Therma-Tru short reach foam compression weather-strip.
 Corner pad seals 2 - 1 at each side jamb at threshold

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.

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Section 2 - MATERIAL CHARACTERISTICS Cont.:

Hardware:

All Specimens

- (1) Kwikset 700 Series Latchbolt (ANSI Grade II) at 60.0 in. from top of panel
(The strikeplate was attached to the latch jamb with (2) #8 x 2.5 in. PFH WS.)
- (1) Kwikset 700 Deadbolt (ANSI Grade II) at 48.0 in. from top of panel
(The strikeplate was attached to the latch jamb with (2) #8 x 2.5 in. PFH WS.)
- (4) 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.)

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.

Out-swing Specimens nos. 1, 2 & 3 14 - # 8 x 2.5 in. Flat Head Phillips wood screws.

- (2) from the left side of the test specimen on the head jamb the screws are located at 6.0 in. and 31.5 in.
- (6) 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 90.5 in.
- (6) from the top down on the right 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 90.5 in.

In-swing Specimen no. 4 14 - # 8 x 2.5 in. Flat Head Phillips wood screws.

- (2) from the left side of the test specimen on the head jamb the screws are located at 6.0 in. and 31.5 in.
- (6) from the top down on the left side of the test specimen the screws are located at 6.0 in., 23.25 in., 40.5 in., 57.75 in., 75.0 in. and 92.0 in.
- (6) from the top down on the right side of the test specimen the screws are located at 6.0 in., 23.25 in., 40.5 in., 57.75 in., 75.0 in. and 92.0 in.

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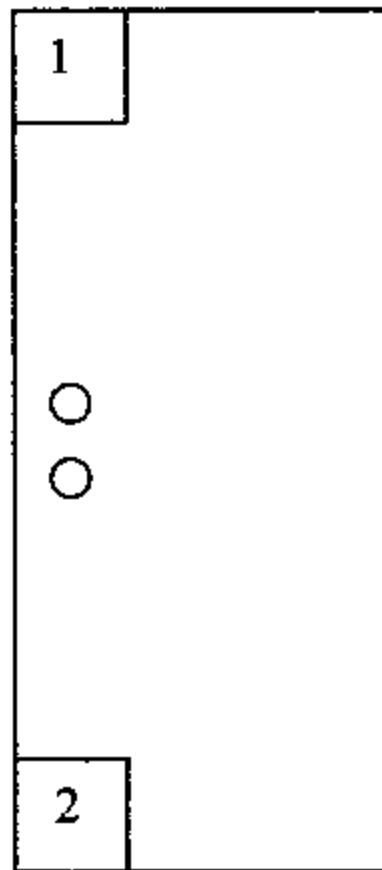
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Section 4 - SEQUENCE OF TESTS PERFORMED:

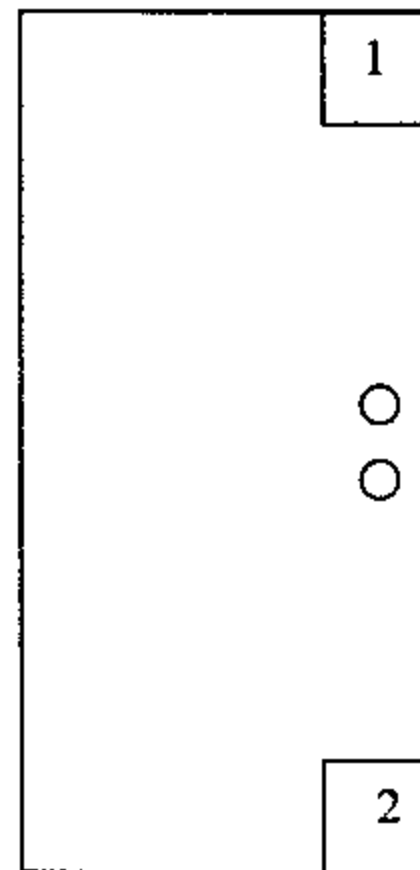
Test Sequence: PA 202

1. Air Infiltration
2. 1/2 Test Pressure Positive
3. Design Pressure Positive
4. 1/2 Test Pressure Negative
5. Design Pressure Negative
6. Water Infiltration Positive Direction
7. Full Test Pressure Positive
8. Full Test Pressure Negative
9. Forced Entry

Deflection Gauges set at X's



X
Out-swing



X
In-swing

Deflection was measured with two (2) Aerospace 2.0 in. dial indicators: location # 1-SN 213293 and location #2-SN 213848.

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

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Test Results:

Specimen 1: Out-swing (X)

AIR INFILTRATION

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

WATER INFILTRATION

Water @ 8.25 psf (15% of 55.0 psf) for 15 min. No water penetration over sill.
(Achieved with standard aluminum out-swing bump threshold.)

Water @ 10.50 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 8.25 psf test.)

Note: The water tests were conducted after the required half and design loads and before full test loads.

STATIC AIR PRESSURE

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	52.5		
Design	30	70.0		
Test	30	105.0	Door T (1) 0.396 in. Door B (2) 0.376 in.	0.052 in. 0.008 in.
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	52.5		
Design	30	70.0		
Test	30	105.0	Door T (1) 2.250 in. Door B (2) 1.750 in.	0.208 in. 0.117 in.

- (1) Loc 1 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.
- (2) Loc 2 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

FORCED ENTRY

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 95.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

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Test Results: Cont.**Specimen 2: Out-swing (X)****AIR INFILTRATION**

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

WATER INFILTRATION

Water @ 8.25 psf (15% of 55.0 psf) for 15 min. No water penetration over sill.

(Achieved with standard aluminum out-swing bump threshold.)

Water @ 10.05 psf (15% of 67.0 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 8.25 psf test.)

Note: The water tests were conducted after the required half and design loads and before full test loads.

STATIC AIR PRESSURE**Design Loads + 67.0 psf, - 67.0 psf. (Out-swing)**

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 0.257 in. Door B (2) 0.397 in.	0.017 in. 0.165 in.

Range of test	time	actual load	deflection	perm. set
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 2.005 in. Door B (2) 1.506 in.	0.183 in. 0.158 in.

(1) Loc 1 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

(2) Loc 2 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

FORCED ENTRY

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 95.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

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Test Results: **Cont.**

Specimen 3: **Out-swing (X)**

AIR INFILTRATION

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

WATER INFILTRATION

Water @ 8.25 psf (15% of 55.0 psf) for 15 min. No water penetration over sill.
(Achieved with standard aluminum out-swing bump threshold.)

Water @ 10.05 psf (15% of 67.0 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 8.25 psf test.)

Note: The water tests were conducted after the required half and design loads and before full test loads.

STATIC AIR PRESSURE

Design Loads + 67.0 psf, - 67.0 psf. (Out-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 0.281 in. Door B (2) 0.352 in.	0.025 in. 0.034 in.

Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 2.150 in. Door B (2) 1.239 in.	0.201 in. 0.132 in.

(1) Loc 1 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

(2) Loc 2 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

FORCED ENTRY

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 95.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

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Test Results: Cont.

Specimen 4: In-swing (X)

AIR INFILTRATION

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

WATER INFILTRATION

Water @ 2.86 psf for 15 min. No water penetration over sill.
(Achieved with standard self adjusting aluminum in-swing threshold and door sweep.)

Note: The water test was conducted after the required half and design loads and before full test loads.

STATIC AIR PRESSURE

Design Loads + 67.0 psf, - 67.0 psf. (In-swing)

Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 2.235 in. Door B (2) 1.210 in.	0.163 in. 0.137 in.

Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	50.25		
Design	30	67.00		
Test	30	100.50	Door T (1) 0.388 in. Door B (2) 0.278 in.	0.018 in. 0.125 in.

- (1) Loc 1 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.
- (2) Loc 2 - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 95.25 in.= 0.381 in.

FORCED ENTRY

	<u>Size</u>	<u>Time</u>	<u>Result</u>
Active Panel	36.0 in. W x 95.25.in. H	30 seconds	(Door remained locked & shut and was operable at the completion of the test.)

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Section 5 - DRAWINGS TO BE SUBMITTED:

1. L2099 sheets 1 through 10 of 10
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:

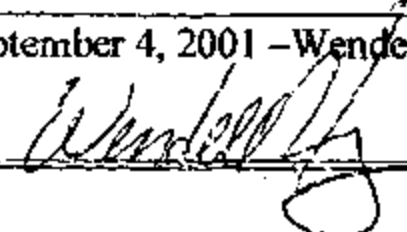
Not present

All Tests Witnessed by:

Wendell Haney, P.E.
Arthur Murray, ETC Laboratories
Bill Yanda, ETC Laboratories

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

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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.

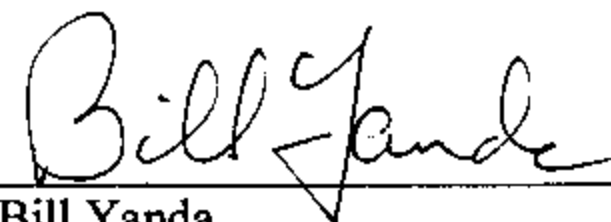
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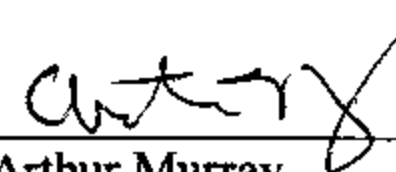
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For ETC Laboratories



Bill Yanda
Test Technician



Arthur Murray
Laboratory Manager
Wind Engineering Laboratory

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