

Report No. ETC 01-741-10639.0
DC Notification Number ETC 01018 - Date: June 11, 2001
ETC Certification # 99-0416.01
Test Start Date: May 15, 2001
Test End Date: May 16, 2001

Test Requested By: THERMA-TRU CORP
108 Mutzfeld Rd.
Butler, IN 46721
Phone 219 - 868 - 5811
Facsimile 219 - 868 - 5190

Tests Conducted: PA 201, PA 202 & PA 203 (with no deviations)

Design Pressures -	Specimen 1	(PA 202)	Out-swing	+ 75.0 psf.	- 75.0 psf.
	Specimen 2	(PA 202)	In-swing	+ 75.0 psf.	- 75.0 psf.
	Specimens 3 & 4	(PA 201 & 203)	Out-swing	+ 75.0 psf.	- 75.0 psf.
	Specimen 5	(PA 201 & 203)	In-swing	+ 75.0 psf.	- 75.0 psf.

Section 1 - DESCRIPTION OF SERIES:

Model Designation - Therma-Tru Premium 6'8" Series Opaque Wood Edge Steel Door

Overall Size:

Specimens 1, 3 & 4 (Out-swing Bump Threshold) 37.5 in. W x 80.5 in. H x 4.5625 in. D
Specimens 2 & 5 (In-swing Saddle Threshold) 37.5 in. W x 82.0 in. H x 4.5625 in. D

Configuration: All Specimens (X)

No. & Size of Doors: All Specimens are opaque door panels
1 active leaf - 36.0 in. W x 79.25 in. H

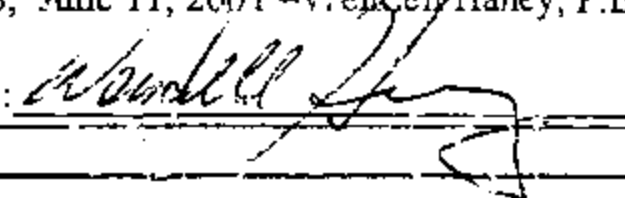
Section 2 - MATERIAL CHARACTERISTICS:

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

Frame Construction:

The head jambs and side jambs are finger jointed pine measuring 4.656 in. x 1.25 in.. The head jamb and side jambs are mortised, butted and joined using (3) 0.5 in. crown x 2.0 in. 16 ga. wire staples at each end. The following thresholds were tested, specimens 1, 3 & 4 - Therma-Tru Aluminum Out-swing Bump measuring 4.602 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. Specimen 1A was 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. Specimens 2 & 5 - Self-adjusting In-swing saddle threshold (Alum/Wood/Vinyl) measuring 5.797 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 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 door jamb.

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 - Wendell Haney, P.E.

Signature: 

Section 2 - MATERIAL CHARACTERISTICS (Cont.):

Panel Construction:

The panel is constructed from 24 Ga. (0.022 in. min. thick) galvanized and prime-coated steel face sheets. The interior cavity of each door is filled with BASF polyurethane foam. The face sheet edges are roll formed to form a mechanical interlock with the hinge (1.250 in. thick x 1.660 in. wide) and latch finger jointed pine stiles (1.253 in. thick x 1.660 in. wide). The stiles are machined to interlock with the steel face sheets. The top rail is finger jointed pine (0.884 in. thick x 1.660 in. wide) and the bottom rail is wood composite (0.844 in. thick by 1.660 in. wide) and kerfed to receive a door sweep (sweep used on in-swing models only). The stiles and rails are pressure fitted and adhesively bonded to the steel face sheets. 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 latch stile was reinforced with a wood lock block measuring 2.625 in. wide x 10.375 in. long x 1.625 in. thick and located at 31.625 in. from the top of the door panel.

Glazing: N / A

Glazing Material: N / A

Glazing Method: N / A

Daylight Opening: N / A

Weather-stripping:

Specimens 1, 3 & 5 Hinge Jamb 1 pc Therma-Tru long reach foam compression weather-strip.
Latch Jamb 1 pc Therma-Tru long reach foam compression weather-strip.
Head Jamb 1 pc Therma-Tru long reach foam compression weather-strip.
Corner pad seals 2 - 1 at each side jamb at threshold

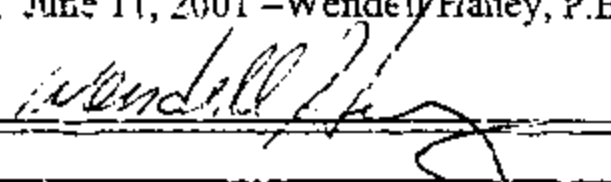
Specimens 2 & 4 Hinge Jamb 1 pc Therma-Tru short reach foam compression weather-strip.
Latch Jamb 1 pc Therma-Tru short reach foam compression weather-strip.
Head Jamb 1 pc Therma-Tru short reach foam compression weather-strip.
Corner pad seals 2 - 1 at each side jamb at threshold

Specimens 1, 3 & 4 - Out-swing Bump threshold 1 row Therma-Tru vinyl bulb weather-strip.

Specimens 2 & 5 - Therma-Tru vinyl fixed door bottom sweep.

Florida Registered Professional Engineers Review:

Reg. # 54158, June 11, 2001 - Wendell Haney, P.E.

Signature: 

Section 2 - MATERIAL CHARACTERISTICS (Cont.):

Hardware: All Specimens (1) Kwikset 700 Series Latchbolt at 44.0 in. from top of panel.
(The strikeplate was attached to the jamb with (2) #8 x 2.5 in. PFH WS.)
(1) Kwikset 700 Deadbolt at 38.5 in. from top of panel.
(The strikeplate was attached to the jamb with (2) #8 x 2.5 in. PFH WS.)
(3) 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 & 5

14 - # 8 x 2.5 in. PFH WS, used to fasten the frame to the wood buck at head and side jambs.

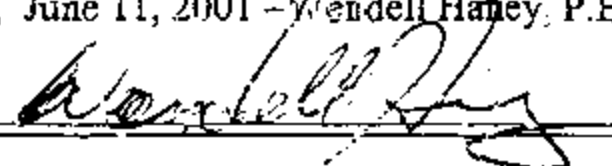
(2) header - one at 6.0 in. from each end.

(6) hinge and latch jamb - In-swing one at 6.0 in. from each end and (4) additional at 14.0 in. on center.
Out-swing one at 6.0 in. from each end and (4) additional at 13.75 in. on center.

(3) threshold - 6.0 from each end and one in the center.

Note - Specimens 2 and 5 (in-swing threshold) were not attached to the wood buck with any screws.

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 - Wendell Haney, P.E.

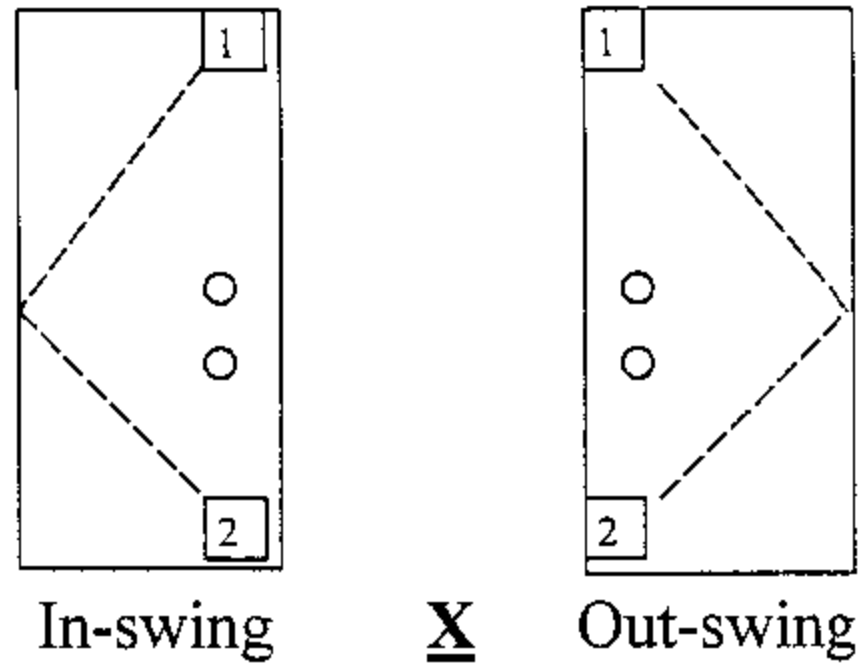
Signature: 

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 Xs



Deflection was measured with two (2) Aerospace 2.0 in. dial indicators: location # 1-SN 213293 and location # 2-SN213848.

Test Results:

AIR INFILTRATION

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

Air at 1.57 psf		Actual	Allowable
Specimen 1	Out-swing	0.04 CFM/SQ FT	0.34 CFM/SQ FT
Specimen 2	In-swing	0.02 CFM/SQ FT	0.34 CFM/SQ FT

WATER INFILTRATION TEST

Water Infiltration Test was conducted in accordance with DCBCCD PA 202 - 94

Specimen 1	Out-swing	Water @ 8.25 psf for 15 min.	No water penetration over sill.
Specimen 1A	Out-swing	Water @ 11.25 psf for 15 min.	No water penetration over sill.
Specimen 2	In-swing	Water @ 2.86 psf for 15 min.	No water penetration over sill.

Note: Specimen 1 (renamed 1A for water test) was affixed with an add on prototype threshold increasing the inner plane of the threshold to 1.875 in. above floor to achieve the higher water test pressure of 11.25 PSF.

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 - Wendell Haney, P.E.

Signature: *Wendell Haney*

Test Results (Cont.):

STATIC AIR PRESSURE TESTS

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

Specimen 1 (Out-swing)		Design Loads + 75.0 psf, - 75.0 psf.		
Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	56.25		
Design	30	75.00		
Test	30	112.50	Door T (1) 0.298 in. Door B (2) 0.400 in.	0.065 in. 0.110 in.

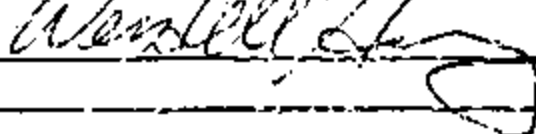
Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	56.25		
Design	30	75.00		
Test	30	112.50	Door T (1) 1.253 in. Door B (2) 1.115 in.	0.088 in. 0.098 in.

Specimen 2 (In-swing)		Design Loads + 75.0 psf, - 75.0 psf.		
Range of test	time	actual load	deflection	perm. set
Positive loads	(seconds)	psf		
1/2 Test	30	56.25		
Design	30	75.00		
Test	30	112.50	Door T (1) 1.115 in. Door B (2) 1.050 in.	0.066 in. 0.073 in.

Range of test	time	actual load	deflection	perm. set
Negative loads	(seconds)	psf		
1/2 Test	30	56.25		
Design	30	75.00		
Test	30	112.50	Door T (1) 0.240 in. Door B (2) 0.196 in.	0.089 in. 0.036 in.

- (1) Door T - Max. allowable perm. set at completion of test load (0.4% of span) $.004 \times 79.25 \text{ in.} = 0.317 \text{ in.}$
- (2) Door B - Max. allowable perm. set at completion of test load (0.4% of span) $.004 \times 79.25 \text{ in.} = 0.317 \text{ in.}$

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 -Wendell Haney, P.E.

Signature: 

Test Results (Cont.):

FORCED ENTRY TEST

Forced Entry Test was conducted in accordance with DCBCCD PA202-94

Specimen	Size	Time	Result
Specimen 1	37.5 in. W x 80.5.in. H	30 seconds	(Doors remained locked & shut)
Specimen 2	37.5 in. W x 82.0 in. H	30 seconds	(Doors remained locked & shut)

NOTE: Active door panel remained engaged and was operable before and after all tests.

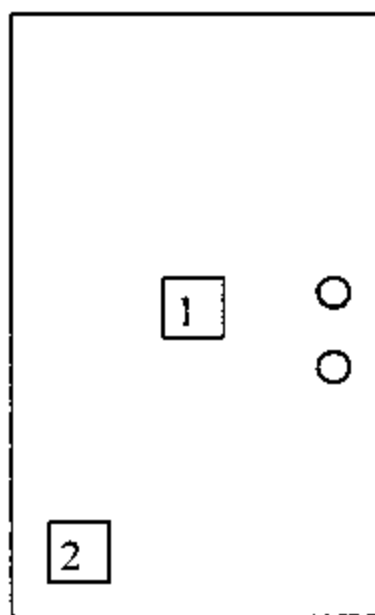
IMPACT TEST – LARGE MISSILE

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

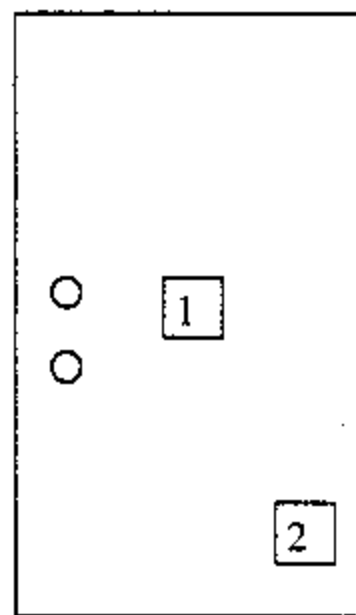
Note:

X measurement from left edge of specimen.
Y measurement from top edge of test specimen.

Type and weight of missile: # 2 Southern Yellow Pine, Nominal 2x4,
Length approx. 88.25 in., Weight - 9 lb.



X (In-swing)



X (Out-swing)

Specimen 3 **Opaque Single Door (Out-swing)**

Impact No.	Impact Loc.	Speed (Ft/Sec)	X-Meas. (in.)	Y-Meas. (in.)
1.	1	49.7	17.50	39.50
2.	2	50.1	29.75	72.75

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 – Wendell Haney, P.E.

Signature: *Wendell Haney*

None of the impacts penetrated the specimen and all locks remained engaged.

Test Results (Cont.):

Specimen 4 Opaque Single Door (Out-swing)

Impact No.	Impact Loc.	Speed (Ft/Sec)	X-Meas. (in.)	Y-Meas. (in.)
1.	1	50.0	19.50	38.50
2.	2	50.1	30.75	71.50

None of the impacts penetrated the specimen and all locks remained engaged.

IMPACT TEST – LARGE MISSILE (Con't.)

Specimen 5 Opaque Single Door (In-swing)

Impact No.	Impact Loc.	Speed (Ft/Sec)	X-Meas. (in.)	Y-Meas. (in.)
1.	1	50.0	18.75 in.	37.50 in.
2.	2	50.1	8.50 in.	72.00 in.

None of the impacts penetrated the specimen and all locks remained engaged.

FATIGUE LOADING TEST

Cycle tests were conducted in accordance with DCBCCD PA 203

Specimen 3 Opaque Single Door (Out-swing)

Design Load psf = + 75.0 psf, - 75.0 psf

Positive loads

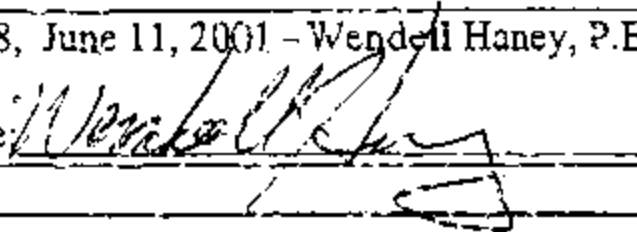
<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 - Wendell Haney, P.E.

Signature: 

671 cycles completed
Test Results (Cont.):

FATIGUE LOADING TEST (Cont.)

Specimen 4 Opaque Single Door (Out-swing)

Design Load psf = + 75.0 psf, - 75.0 psf

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

671 cycles completed

Specimen 5 Opaque Single Door (In-swing)

Design Load psf = + 75.0 psf, - 75.0 psf

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load</u>	<u>Cycles/Min.</u>
+ .0 to 0.5	600	37.5 PSF	21
+ .0 to 0.6	70	45.0 PSF	21
+ .0 to 1.3	1	97.5 PSF	

671 cycles completed

Specimens showed no resultant failure or duress after cycle test. No failure of fasteners. Locks remained engaged. There were no cracks longer than 5 in. x 1/16 in. through which air could pass observed. The door was operable at end of test.

Section 5 - DRAWINGS TO BE SUBMITTED:

1. L-2150 sheets 1 through 10
2. Laboratory Anchor Sketch

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.

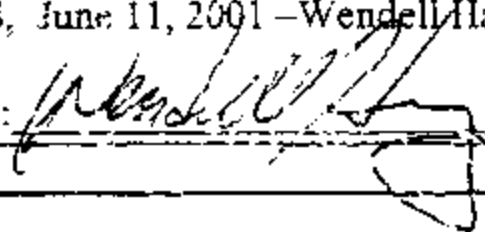
Dade County Witness:

Not present

All Tests Witnessed by:

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

Florida Registered Professional Engineers Review: Reg. # 54158, June 11, 2001 – Wendell Haney, P.E.

Signature: 

cc: THERMA-TRU CORP. (2)
 Rick Wright (2)
 File (1)

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.

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.

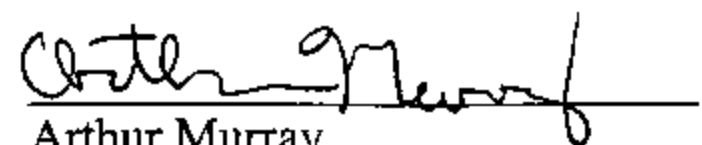
ETC Laboratories makes no opinions or endorsements regarding this product and its performance. This report may not be reproduced or quoted in partial form without the expressed written approval of ETC Laboratories.

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. # 54158, June 11, 2001 - Wendy Haney, P.E.

Signature: 