

Report No. ETC 01-741-10622.0
DC Notification Number ETC 01018 - Date: May 25, 2001
ETC Certification # 99-0416.01
Test Start Date: March 23, 2001
Test End Date: May 1, 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	+ 67.0 psf.	- 67.0 psf.
	Specimen 2,	(PA 202)	In-swing	+ 67.0 psf.	- 67.0 psf.
	Specimen 5	(PA 201 & 203)	In-swing	+ 67.0 psf.	- 67.0 psf.
	Specimens 3 & 4	(PA 201 & 203)	Out-swing	+ 67.0 psf.	- 67.0 psf.

Section 1 - DESCRIPTION OF SERIES:

Model Designation - Therma-Tru Construction Series Opaque Wood Edge Steel Door

Overall Size:

Specimens 1, 3 & 4 - Out-swing Bumper Threshold - 37.5 in. W. x 80.5 in. H. x 4.6 in. D
Specimens 2 & 5 - In-swing Saddle Threshold - 37.5 in. W x 82.0 in. H x 4.6 in. D

Configuration: All Specimens are operable (X)

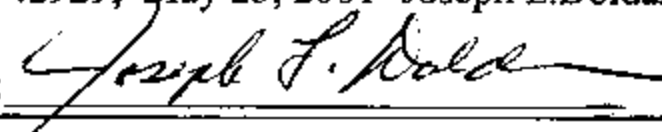
No. & Size of Doors: All Specimens are opaque door panels
1 active leaf - 36.0 in. W x 79.25 in. H

Section 2 - MATERIAL CHARACTERISTICS:

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

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Section 2 - MATERIAL CHARACTERISTICS Cont.:

Frame Construction:

The head jambs and side jambs are finger jointed pine measuring 4.656 in. W. x 1.211 in. Thk. 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, 3 & 4 - Therma-Tru Aluminum Out-swing Bump measuring 4.602 in. x 0.837 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 1.878 in. at the inner most plane of the frame system. Specimens 2 & 5 - Self-adjusting In-swing saddle threshold (Alum/Wood/Vinyl) measuring 5.767 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.

Panel Construction:

The panel is constructed from 25 Ga. (0.018 in. min. thick) galvanized and primed 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 (1.234 in. thick x 1.660 in. wide) and latch finger jointed pine stiles (1.242 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 (0.789 in. thick x 1.660 in. wide) and the bottom rail is wood composite (0.892 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 contact cement is used to secure them 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" x 4.0" butt type hinges.

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

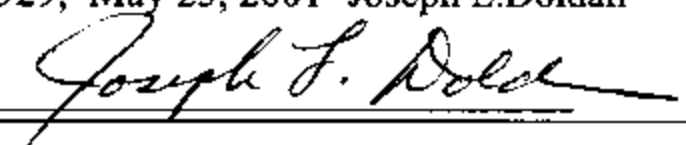
Specimens 1, 3 & 4 - Out-swing Bump threshold 1 row Therma-Tru vinyl bulb weather-strip.

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

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Section 2 - MATERIAL CHARACTERISTICS (Con't.):

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) were not attached to the wood buck with any screws.

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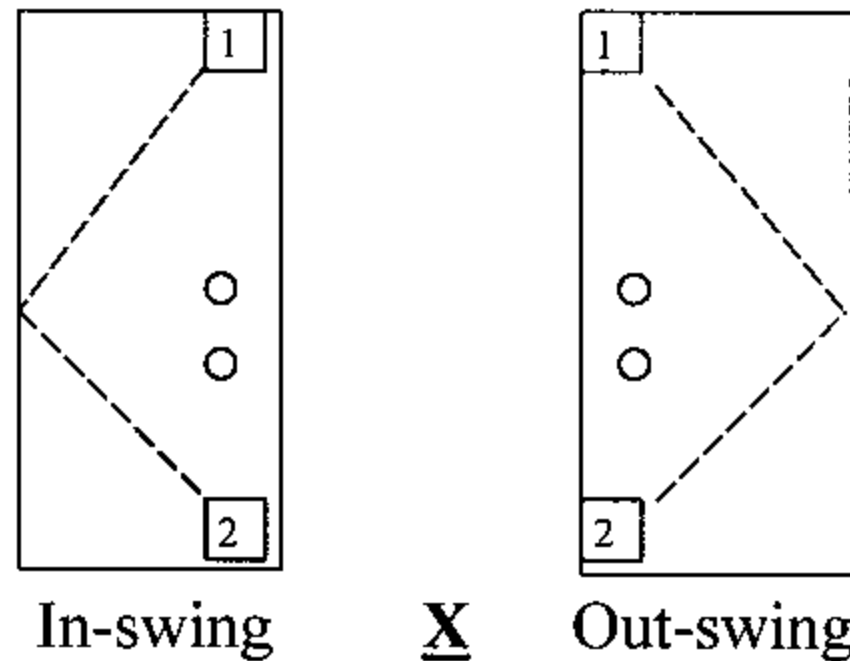
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Section 4 - SEQUENCE OF TESTS PERFORMED:**Test Sequence: PA 202**

1. Air Infiltration
2. ½ Test Pressure Positive
3. Design Pressure Positive
4. ½ 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" 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	0.02 CFM/SQ FT	0.34 CFM/SQ FT
Specimen 2	In-swing	0.17 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 @ 10.0 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 10.0 PSF.

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TEST RESULTS Cont.:

STATIC AIR PRESSURE TESTS

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

Specimen 1 (out-swing)		Design Loads		+ 67.0 psf, - 67.0 psf.	
Range of test	Time (Sec.)	Load (psf)	Deflection (in.)	Perm. Set (in.)	
Positive loads					
1/2 Test	30	50.25			
Design	30	67.00			
Test	30	100.50	Door T (1) 0.389 Door B (2) 0.372	0.015 0.016	
Range of test	Time (Sec.)	Load (psf)	Deflection (in.)	Perm. Set (in.)	
Negative loads					
1/2 Test	30	50.25			
Design	30	67.00			
Test	30	100.50	Door T (1) 1.750 Door B (2) 1.650	0.281 0.257	

(1) Door T - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.
 (1) Door T - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.

Specimen 2 (In-swing)		Design Loads		+ 67.0 psf, - 67.0 psf.	
Range of test	Time (Sec.)	Load (psf)	Deflection (in.)	Perm. Set (in.)	
Positive loads					
1/2 Test	30	50.25			
Design	30	67.00			
Test	30	100.50	Door T (1) 1.610 Door B (2) 1.510	0.274 0.251	
Range of test	Time (Sec.)	Load (psf)	Deflection (in.)	Perm. Set (in.)	
Negative loads					
1/2 Test	30	50.25			
Design	30	67.00			
Test	30	100.50	Door T (1) 0.395 Door B (2) 0.365	0.012 0.010	

(1) Door T - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.
 (1) Door T - Max. allowable perm. set at completion of test load (0.4% of span) .004 x 79.25 in. = 0.317 in.

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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

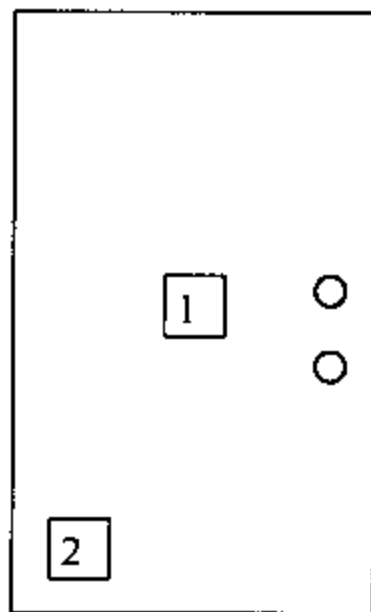
Impact tests were conducted in accordance with DCBCCD PA 201-94.

Note:

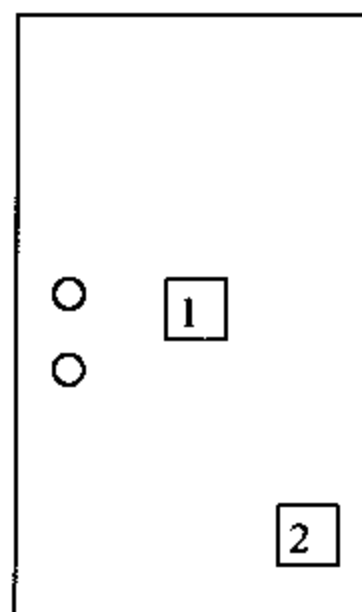
X measurement from left edge of specimen.

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	50.1	16.75	40.25
2.	2	50.2	28.75	71.00

None of the impacts penetrated the specimen and all locks remained engaged. 8-7-01

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TEST RESULTS Cont.:

IMPACT TEST – LARGE MISSILE Cont:

Specimen 4 Opaque Single Door (Out-swing)

Impact No.	Impact Loc.	Speed (Ft/Sec)	X-Meas (in.)	Y-Meas (in.)
1.	1	50.1	18.0	40.0
2.	2	50.0	28.5	72.5

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

Specimen 5 Opaque Single Door (In-swing)

Impact No.	Impact Loc.	Speed (Ft/Sec)	X-Meas (in.)	Y-Meas (in.)
1.	1	50.2	16.75	39.50
2.	2	50.1	8.0	72.0

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 = + 67.0 psf, - 67.0 psf

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

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TEST RESULTS Cont.:

FATIGUE LOADING TEST (Con.t.)

Specimen 4 **Opaque Single Door (Out-swing)**

Design Load psf = + 67.0 psf, - 67.0 psf

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

Specimen 5 **Opaque Single Door (In-swing)**

Design Load psf = + 67.0 psf, - 67.0 psf

Positive loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

Negative Loads

<u>Range of Test</u>	<u># Cycles</u>	<u>Load (psf)</u>	<u>Cycles/Min.</u>
+ 0 to 0.5	600	33.5	23
+ 0 to 0.6	70	40.2	23
+ 0 to 1.3	1	87.1	

671 cycles completed

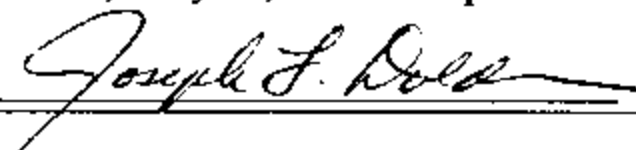
Specimens showed no resultant failure or duress after cycle test. No failure of fasteners. Locks remained engaged. There were no cracks longer than 5 in. x 1/16 in. through which air could pass observed. The door was operable at end of test.

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Section 5 - DRAWINGS TO BE SUBMITTED:

1. L-2110 sheets 1 through 10 of 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:

Joseph L. Doldan, P.E.
Arthur Murray, ETC Laboratories
Bill Yanda, ETC Laboratories

cc: THERMA TRU CORP. (2)
Rick Wright (2)
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.

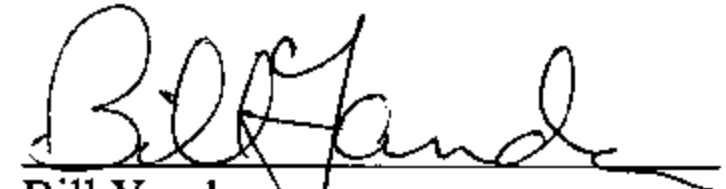
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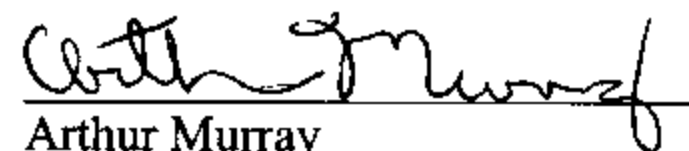
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For ETC Laboratories


Bill Yanda
Test Technician


Arthur Murray
Laboratory Manager
Wind Engineering Laboratory

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