Architectural Testing

ASTM E 90 SOUND TRANSMISSION LOSS TEST REPORT

Rendered to:

UNITED STATES ALUMINUM

SERIES/MODEL: 900 SERIES

TYPE: Out Swing Single Terrace Door

Summary of Test Results			
ATI Data File No.	**Glazing**	**STC**	**OITC**
63137.01	Full lite window with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)	34	28

Reference should be made to ATI Report No. 63137.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

130 Derry Court
York, PA 17402-9405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

UNITED STATES ALUMINUM
200 Singleton Drive
Waxahachie, Texas 75165

Report No:	63137.01-113-11
Test Date:	03/15/06
Report Date:	03/24/06
Expiration Date:	03/15/10

Test Sample Identification:

Series/Model: 900 Series

Type: Out Swing Single Terrace Door

Overall Size: 38" by 86"

Leaf Description: Thermally Broken Aluminum

Glazing: Full Lite Window with 1" IG (1/4" Tempered, 1/2" Air Space, 1/4" Tempered)

Project Scope: Architectural Testing, Inc. (ATI) was contracted by United States Aluminum to conduct a sound transmission loss test on a Series/Model 900 Series, out swing single terrace door. A summary of the results is listed in the Test Results section and the complete test data is included as Appendix B of this report.

Test Methods: The acoustical tests were conducted in accordance with the following:

ASTM E 90-04, *Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.*

ASTM E 413-04, *Classification for Rating Sound Insulation.*

ASTM E 1332-90 (Re-approved 2003), *Standard Classification for Determination of Outdoor-Indoor Transmission Class.*

ASTM E 2235-04, *Standard Test Method for Determination of Decay Rates for Use in Sound Insulation Test Methods*.

Test Equipment: The equipment used to conduct these tests meets the requirements of ASTM E 90. The microphones were calibrated before conducting sound transmission loss tests. The test equipment and test chamber descriptions are listed in Appendix A.

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Sample Installation:

Sound transmission loss tests were initially performed on a filler wall that was designed to test 40" by 86" and 80" by 86" test specimens. The filler wall achieved an STC rating of 64.

The 40" by 86" plug was removed from the filler wall assembly. The door system was placed on a foam isolation pad in the test opening. Duct seal was used to seal the perimeter of the test specimen to the test opening on both sides. The interior side of the door frame, when installed, was approximately 1/4" from being flush with the receiving room side of the filler wall. A stethoscope was used to check for any abnormal air leaks around the test specimen prior to testing. The door leaf was opened and closed at least five times prior to testing.

Test Procedure: The door was closed and latched for this test. The sound transmission loss test consisted of the following measurements: One background noise sound pressure level and five sound absorption measurements were conducted at each of the five microphone positions. Two sound pressure level measurements were made simultaneously in both rooms, at each of the five microphone positions. The air temperature and relative humidity conditions were monitored and recorded during the background, absorption, source, and receive room measurements.

Sample Descriptions:

Door Construction:

		Main Frame	**Leaf**
Size		38" by 86"	36-3/4" by 84-5/8"
Thickness		4-1/2"	2-1/4"
Corners		Butted	Mitered
	Fasteners	Screws	Keys and stakes
	Seal Method	None	None
MATERIAL		Aluminum	Aluminum
	Reinforcement	N/A	N/A
	Thermal Break Material	Insulbar	Insulbar
Daylight Opening Size		N/A	28-7/8" by 76-7/8"

Sample Descriptions: (Continued)

Glazing:

Measured Overall Insulation Glass Unit Thickness	0.985"
Spacer Type	Aluminum

	Exterior Sheet	**Gap**	**Interior Sheet**
MEASURED THICKNESS	0.225"	0.531"	0.229"
MUNTIN PATTERN	N/A	N/A	N/A
MATERIAL	Tempered	Air*	Tempered
LAMINATE MATERIAL	N/A	N/A	N/A

GLAZING METHOD	Exterior
GLAZING MATERIAL	Butyl tape
GLAZING BEAD MATERIAL	Aluminum with flexible wedge gasket

Components:

TYPE	**QUANTITY**	**LOCATION**
WEATHERSTRIP		
1/4" Diameter hollow bulb gasket	1 Row	Frame perimeter
1/4" Diameter foam filled bulb gasket	1 Row	Leaf perimeter *Note: a 10" section of the bulb was notched from both ends of the bottom rail*
HARDWARE		
Metal hinge	3	Hinge jamb
Multi-point locking system with handle	1	Lock stile
Metal deadbolt lock	1	Lock stile
Metal lock keeper	4	Sill, head and keeper jamb

Sample Descriptions: (Continued)

Components: (Continued)

	TYPE	QUANTITY	LOCATION
DRAINAGE			
	1-1/2" by 3/16" Weep slot with cover	2	Sill
	3/4" by 1/8" Weep slot	2	Glazing bead on bottom rail

* - *Stated per Client/Manufacturer N/A-Non Applicable*

Comments: The total weight of the sample was 183 lbs. The design drawings (included in Appendix C) supplied by the client, accurately describe the Series/Model 900 Series, out swing single terrace door. The dimensions on the drawings that are circled and/or checked were verified against the test specimen. The door was disassembled, and the components will be retained by ATI for four years. Photographs of the test specimen are included in Appendix D.

Test Results: The STC (Sound Transmission Class) rating was calculated in accordance with ASTM E 413. The OITC (Outdoor-Indoor Transmission Class) was calculated in accordance with ASTM E 1332. A summary of the sound transmission loss test results on the Series/Model 900 Series, out swing single terrace door is listed below.

ATI Data File No.	Leaf Description / Glazing Option	STC	OITC
63137.01	Full lite window with 1" IG (1/4" tempered, 1/2" air space, 1/4" tempered)	34	28

The complete test results are listed in Appendix B. Flanking limit tests and reference specimen tests are available upon request.

The complete test results are listed in Appendix B.

This report is prepared for the convenience of our customer and endeavors to provide accurate and timely project information. It contains a summary of observations made by a qualified representative of Architectural Testing, Inc. The results of this report apply only to the specimen that was tested. The statements made herein do not constitute approval, disapproval, certification or acceptance of performance or materials.

A copy of this report will be retained by ATI for a period of four years from the original test date. This report is the exclusive property of the client so named herein. This report shall not be reproduced, except in full, without written approval by Architectural Testing, Inc.

For ARCHITECTURAL TESTING, INC:

Digitally Signed by: Ned A. Leppo

Ned A. Leppo
Project Engineer - Acoustical Testing

Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

NAL:hlc

Attachments (pages):
- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Drawings (1)
- Appendix-D: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	03/24/06	N/A	Original report issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	Y002929
Receive Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002818
Source Room Microphone	ACO Pacific	7047	1/2", pressure type, condenser microphone	Y002820
Receive Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002752
Source Room Preamp	ACO Pacific	4012	1/2" preamplifier	Y002185
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816
Noise Source	Delta Electronics	SNG-1	Two, non-coherelated "Pink" noise signals	Y002181
Equalizer	Rane	RPE228	Programmable EQ	Y002180
Power Amplifiers	Renkus-Heinz	P2000	2 - Amplifiers	Y002179 Y001779
Receive Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y001784 Y001785
Source Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	2 - Loudspeakers	Y002649 Y002650

Test Chamber:

	Volume	Description
Receiving Room	8291.3 ft^3 (234m^3)	Rotating vane and stationary diffusers. Temperature and humidity controlled. Isolation pads under the floor.
Source Room	7296.3 ft^3 (206.6m^3)	Stationary diffusers only. Temperature and humidity controlled.

	Maximum Size	Description
TL Test Opening	14 ft wide by 10 ft high	Vibration break between source and receive rooms.

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Appendix B

Complete Test Results

SOUND TRANSMISSION LOSS

ASTM E90

Architectural Testing

ATI No.	63137.01	**Date**	03/15/06
Client	United States Aluminum		
Specimen	Series/Model: 900 Series, out swing single terrace door, 1" IG(1/4" tempered, 1/2" airspace, 1/4" tempered)		
Specimen Area	22.69 Sq Ft		
Filler Area	117.31 Sq Ft		
Operator	Ned A. Leppo		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	73.4	73.9	72.6	73.5	71.8	73.3
RH %	63.0	62.2	63.0	62.8	64.6	62.8

Freq (Hz)	Bkgrd SPL (dB)	Absorp (Sabines /Sq Ft)	Source SPL (dB)	Receive SPL (dB)	Filler TL (dB)	Specimen TL (dB)	95% Conf Limit	No. of Defici-encies	Trans Coef Diff
80	40.1	56.0	80.2	53.2	30.1	24	2.08	0	0.0
100	42.5	56.9	83.4	56.0	36.3	25	2.33	0	5.8
125	43.8	52.3	88.7	61.7	42.9	24	2.16	0	12.4
160	40.9	53.2	92.6	73.0	46.0	16	3.10	5	22.9
200	39.9	50.3	96.8	65.6	50.9	28	0.78	0	16.0
250	35.0	55.2	99.0	72.4	50.8	23	1.25	4	21.0
315	32.2	59.0	97.2	66.2	56.9	27	0.95	3	22.9
400	30.4	58.6	96.0	60.7	60.6	31	0.51	2	22.3
500	28.8	57.3	97.2	58.5	59.9	35	0.48	0	18.1
630	23.8	57.4	100.2	58.5	64.7	38	0.43	0	19.9
800	24.1	59.0	101.3	57.6	66.4	40	0.43	0	19.7
1000	22.1	62.6	100.7	56.5	67.0	40	0.25	0	20.0
1250	21.6	66.4	103.2	57.2	74.5	41	0.31	0	26.0
1600	17.7	70.8	109.6	66.5	76.3	38	0.24	0	31.0
2000	13.2	78.0	105.3	68.5	76.0	31	0.23	7	37.4
2500	6.7	89.6	103.7	65.2	75.5	33	0.22	5	35.9
3150	6.7	105.7	104.9	60.8	77.7	37	0.20	1	33.1
4000	6.5	130.2	103.7	53.1	81.3	43	0.36	0	31.1
5000	7.1	172.9	102.0	46.6	82.9	47	0.41	0	29.2

STC Rating = **34** *(Sound Transmission Class)*
Deficiencies = **27** *(Number of deficiencies versus contour curve)*
OITC Rating = **28** *(Outdoor/Indoor Transmission Class)*

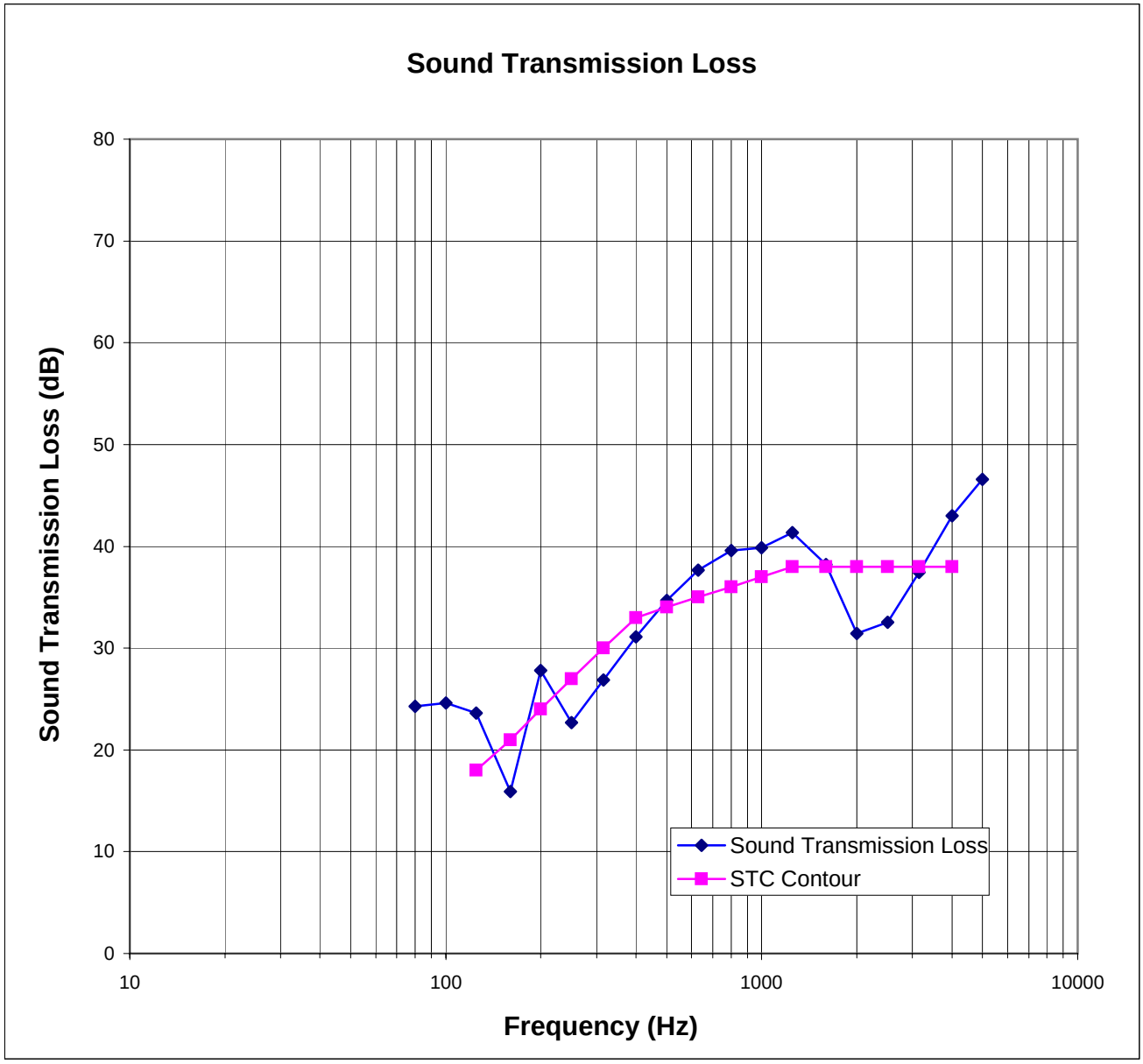
Note: *The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.*

NVLAP LAB CODE 200361

Architectural Testing, Inc is accredited by the National Institute of Standards and Technology (NIST) under the National Voluntary Laboratory Accreditation Program for the specific test methods listed under lab code 200361. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by NIST. This test report applies only to the specimen that was tested.

Architectural Testing

ATI No.	63137.01	**Date**	03/15/06
Client	United States Aluminum		
Specimen	Series/Model: 900 Series, out swing single terrace door, 1" IG(1/4" tempered, 1/2" airspace, 1/4" tempered)		
Specimen Area	22.69 Sq Ft		
Filler Area	117.31 Sq Ft		
Operator	Ned A. Leppo		



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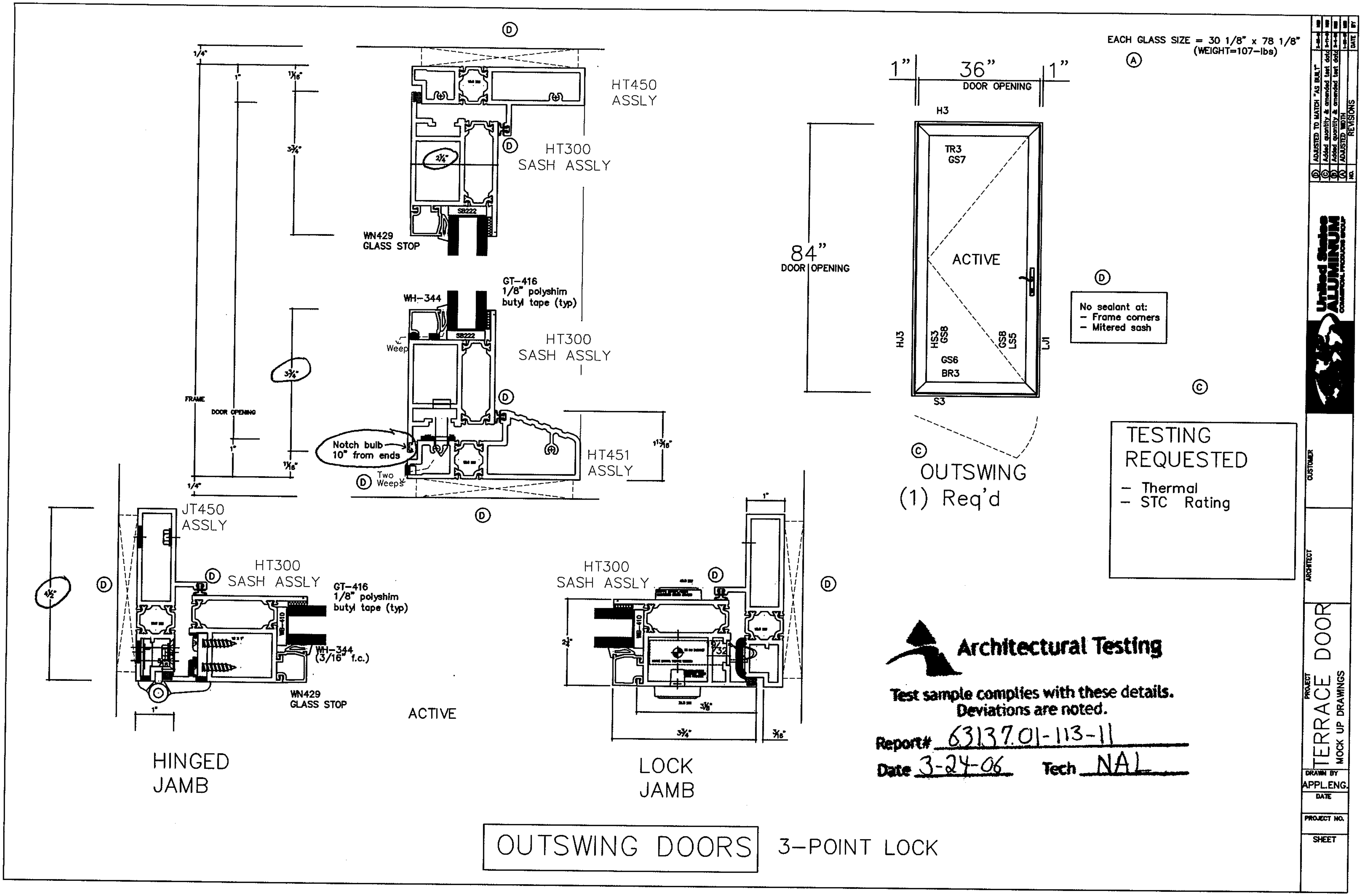
Appendix C

Design Drawings


HT450
ASSLY
HT300
SASH ASSLY
WN429
GLASS STOP
SB222
GT-416
1/8" polyshim
butyl tape (typ)
WH-344
Weep
HT300
SASH ASSLY
FRAME
DOOR OPENING
Notch bulb
10" from ends
Two
Weeps
HT451
ASSLY
JT450
ASSLY
HT300
SASH ASSLY
GT-416
1/8" polyshim
butyl tape (typ)
WH-344
(3/16" f.c.)
WN429
GLASS STOP
ACTIVE
HINGED
JAMB
HT300
SASH ASSLY
LOCK
JAMB
EACH GLASS SIZE = 30 1/8" x 78 1/8"
(WEIGHT=107-lbs)
1"
36"
DOOR OPENING
1"
H3
TR3
GS7
84"
DOOR OPENING
ACTIVE
HJ3
HS3
GS8
GS8
LS5
LJ1
GS6
BR3
S3
OUTSWING
(1) Req'd
No sealant at:
– Frame corners
– Mitered sash
TESTING
REQUESTED
– Thermal
– STC Rating
Architectural Testing
Test sample complies with these details.
Deviations are noted.
Report# 63137.01-113-11
Date 3-24-06
Tech NAL
United States
ALUMINUM
REVISIONS
CUSTOMER
ARCHITECT
PROJECT
TERRACE DOOR
MOCK UP DRAWINGS
DRAWN BY
APPL.ENG.
DATE
PROJECT NO.
SHEET
OUTSWING DOORS
3-POINT LOCK

Appendix D

Photographs

Interior View of Specimen

Exterior View of Specimen