Architectural Testing

ASTM E 90 SOUND TRANSMISSION LOSS TEST REPORT

Rendered to:

ZERO INTERNATIONAL

SERIES/MODEL: 4484

TYPE: Side-Hinged Door

Summary of Test Results			
Data File No.	**Leaf Description / Glazing Option (Nominal Dimensions)**	**STC**	**OITC**
91778.01	Steel skin door with proprietary core with half lite 1-1/2" IG (1/4" laminated, 1" air space, 1/4" laminated), Glass temperature 75°F	45	37

Reference should be made to Architectural Testing, Inc. Report No. 91778.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

Architectural Testing

ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

ZERO INTERNATIONAL
415 Concord Avenue
Bronx, New York 10455-4801

Report No:	91778.01-113-11
Revision 1:	08/06/09
Test Date:	05/14/09
Report Date:	05/22/09
Expiration Date:	05/14/13

Test Sample Identification:

Series/Model: 4484

Type: Side-Hinged Door

Overall Leaf Size: 35-3/4" by 83-1/2" by 1-3/4"

Leaf Description: Steel Skin with Proprietary Core

Glazing (Nominal Dimensions): Half Lite with 1-1/2" IG (1/4" Laminated, 1" Air Space 1/4" Laminated), Glass Temperature 75°

Project Scope: Architectural Testing, Inc. was contracted by Zero International to conduct sound transmission loss tests on a Series/Model 4484, side-hinged 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. The sample was provided by the client.

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.*

130 Derry Court
York, PA 17406-8405
phone: 717-764-7700
fax: 717-764-4129
www.archtest.com

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.

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 67.

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 panel 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
Size		43" by 84"
Thickness		6"
Corners		Mitered
	Fasteners	Welds
	Seal Method	None
Material		Steel / Concrete filled
	Thermal Break Material	N/A

N/A-Non Applicable

Leaf Materials: As per client, the core materials are proprietary.

Comments: The leaf was originally tested without the half lite. The door was tested operable with the same seal configuration and received an STC rating of 47. The door was cut to fit the half lite with a daylight opening of 12" by 12" and tested. This report reflects the test with the half lite only.

Sample Descriptions: (Continued)

Glazing:

Measured Overall Insulation Glass Unit Thickness	1.512"
Spacer Type	Solid aluminum

	Exterior Sheet	**Gap**	**Interior Sheet**
Measured Thickness	0.256"	1.000"	0.256"
Muntin Pattern	N/A	N/A	N/A
Material	Laminated	Air*	Laminated
Laminate Material	PVB	N/A	PVB
Glazing Method	Channel, sealed with silicone		

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

Components:

	TYPE	**QUANTITY**	**LOCATION**
Weatherstrip			
	Zero International 119 WB	1 Row	Bottom rail, head and jambs
	Zero International 770 A	1 Row	Head and jambs
	Zero International 564 saddle	1	Sill
	Zero International 367 automatic door bottom	1	Bottom raill
Hardware			
	Lock set with strike plate	1	Lock stile
	Security Acoustics cam lift hinge	3	Hinge jamb
Drainage			
	No drainage		

Comments: The weight of the test sample was 240 lbs. The client did not supply drawings on the Series/Model 4484, side-hinged door. The test specimen was returned per the client's request. Photographs of the test specimen are included in Appendix C.

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 4484, side-hinged door is listed below.

Summary of Test Results			
Data File No.	**Leaf Description / Glazing Option (Nominal Dimensions)**	**STC**	**OITC**
91778.01	Steel skin door with proprietary core with half lite 1-1/2" IG (1/4" laminated, 1" air space, 1/4" laminated), Glass temperature 75°F	45	37

***Note**: Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. On each data sheet listed in Appendix B, the cells are highlighted red for the transmission loss values limited in this way. Due to the calculations and sample size, transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. On each data sheet listed in Appendix B, cells highlighted in green indicate transmission loss values affected in this way.*

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

Detailed drawings, data sheets, representative samples of test specimens, a copy of this report, or other pertinent project documentation will be retained by Architectural Testing for a period of four years from the original test date. At the end of this retention period, such materials shall be discarded without notice and the service life of this report will expire. Results obtained are tested values and were secured by using the designated test methods. This report does not constitute certification of this product nor an opinion or endorsement by this laboratory. It is the exclusive property of the client so named herein and relates only to the specimen tested. This report may not be reproduced, except in full, without the written approval of Architectural Testing.

For ARCHITECTURAL TESTING, INC:

Digitally Signed by: Kurt A. Golden

Kurt A. Golden
Senior Technician - Acoustical Testing

Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor - Acoustical Testing

KAG:jmcs

Attachments (pages): This report is complete only when all attachments listed are included.
- Appendix-A: Equipment description (1)
- Appendix-B: Complete test results (2)
- Appendix-C: Photographs (1)

Revision Log

Rev. #	Date	Page(s)	Revision(s)
0	05/22/09	N/A	Original Report Issue
1	08/06/09	Page 3	Changed 364 to 564 saddle

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	Y002929
Receive Room Microphone	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003246
Source Room Microphone	G.R.A.S.	40AR	1/2", pressure type, condenser microphone	Y003245
Receive Room Preamp	G.R.A.S.	26AK	1/2" Preamplifier	Y003249
Source Room Preamp	G.R.A.S.	26AK	1/2" Preamplifier	Y003248
Microphone Calibrator	Bruel & Kjaer	4228	Pistonphone calibrator	Y002816
Noise Source	Delta Electronics	SNG-1	Two, uncorrelated "Pink" noise signals	Y002181
Equalizer	Rane	RPE228	Programmable EQ	Y002180
Power Amplifiers	Renkus-Heinz	P2000	Two Amplifiers	Y002179 Y001779
Receive Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	Two Loudspeakers	Y001784 Y001785
Source Room Loudspeakers	Renkus-Heinz	Trap Jr/9"	Two Loudspeakers	Y002649 Y002650

Test Chamber:

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

Appendix B

Complete Test Results

Architectural Testing

SOUND TRANSMISSION LOSS

ASTM E 90

ATI No.	91778.01	**Date**	05/14/09
Client	Zero International		
Specimen	Steel skin door with proprietary core with half lite 1-1/2" IG (1/4" laminated, 1" air space, 1/4" laminated), Glass temperature 75°F		
Specimen Area	20.73 Sq Ft		
Filler Area	119.27 Sq Ft		
Operator	Kurt Golden		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	73.9	74.3	69.6	74.1	74.4	73.0
RH %	43.2	42.5	47.3	42.9	43.6	44.0

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	44.1	58.3	91.0	62.8	31.0	25	2.51	0	-0.3
100	41.3	61.1	98.4	69.9	35.2	25	3.26	0	3.9
125	42.8	53.9	104.3	71.0	43.7	30	2.18	0	7.0
160	43.7	52.8	105.8	71.6	46.8	31	1.10	1	9.0
200	42.1	56.9	110.7	69.5	55.3	37	1.16	0	10.9
250	41.3	56.8	110.8	66.1	60.2	41	0.68	0	12.3
315	40.8	58.6	107.1	63.8	62.7	39	0.58	2	16.3
400	40.4	59.8	105.9	61.2	62.8	40	0.57	4	15.1
500	39.9	60.1	107.7	57.4	63.2	46	0.50	0	10.0
630	35.9	60.6	110.3	61.1	67.1	45	0.46	1	15.0
800	37.0	59.7	110.0	62.5	67.8	43	0.33	4	17.2
1000	35.3	62.9	108.6	60.4	70.3	43	0.53	5	19.4
1250	34.7	70.3	109.8	60.6	72.1	44	0.34	5	20.7
1600	32.3	72.1	114.3	62.2	75.2	47	0.31	2	20.9
2000	23.2	78.0	107.7	53.3	75.8	49	0.15	0	19.6
2500	13.2	89.6	104.9	50.1	77.1	48	0.34	1	21.1
3150	12.7	107.4	105.1	48.6	78.5	49	0.32	0	21.6
4000	10.9	127.3	102.7	44.3	81.8	51	0.30	0	23.6
5000	9.4	169.0	98.7	37.6	85.1	52	0.37	0	25.5

STC Rating =	**45**	*(Sound Transmission Class)*
Deficiencies =	**25**	*(Number of deficiencies versus contour curve)*
OITC Rating =	**37**	*(Outdoor/Indoor Transmission Class)*

Notes:

1) The acoustical chambers are qualified for measurements down to 80 hertz. Data reported below 80 hertz is for reference only.

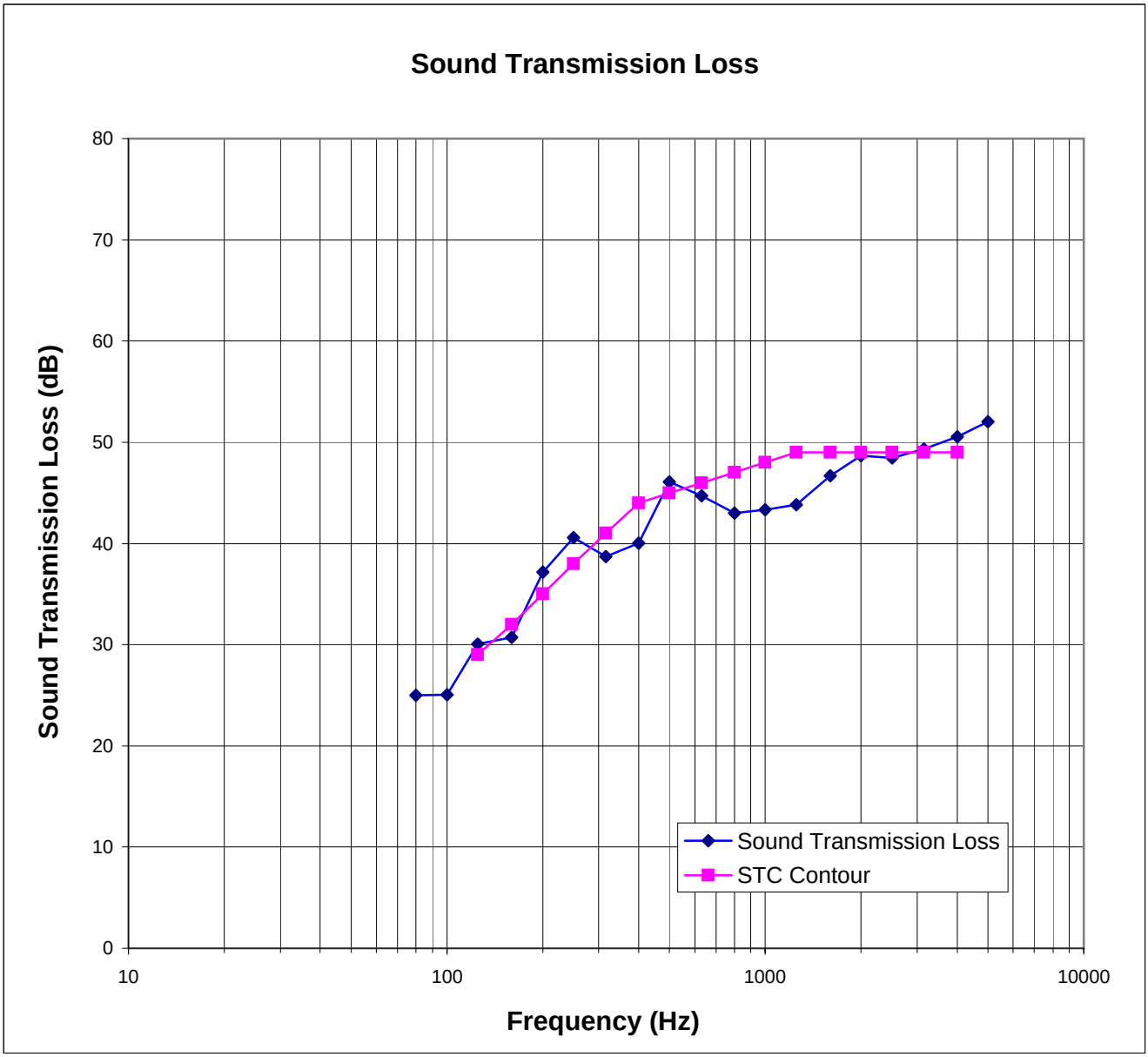
2) Transmission loss coefficient differences less than 6 indicate the lower limit of the transmission loss for this specimen. These cells are highlighted red.

3) Transmission loss coefficient differences between 6 and 15 indicate there has been a filler wall correction applied. These cells are highlighted green.

4) Receive Room levels less than 5dB above the Background levels are highlighted in yellow.

Architectural Testing

ATI No.	91778.01	**Date**	05/14/09
Client	Zero International		
Specimen	Steel skin door with proprietary core with half lite 1-1/2" IG (1/4" laminated, 1" air space, 1/4" laminated), Glass temperature 75°F		
Specimen Area	20.73 Sq Ft		
Filler Area	119.27 Sq Ft		
Operator	Kurt Golden		



ACCREDITED

Architectural Testing, Inc is accredited by the International Accreditation Service, Inc. (IAS) under the specific test methods lis under lab code TL-144, in accordance with the recognized International Standard ISO/IEC 17025:2005. The laboratory's accreditation or test report in no way constitutes or implies product certification, approval, or endorsement by IAS. This test report applies only to the specimen that was tested.

Appendix C

Photographs

Receive Room View of the Installed Specimen

Source Room View of Installed Specimen