



**ASTM E 90 SOUND TRANSMISSION LOSS
TEST REPORT**

Rendered to:

KNIGHT - CELOTEX

SERIES/MODEL: Soundstop[®] floor underlayment

TYPE: Floor/Ceiling Assembly with Soundstop[®] floor underlayment

Summary of Test Results			
ATI Data File No.	Description	STC	OITC
61789.01	Floor/Ceiling Assembly with Soundstop [®] floor underlayment	41	28

Reference should be made to ATI Report No. 61789.01-113-11 for complete test specimen description. The complete test results are listed in Appendix B.



ACOUSTICAL PERFORMANCE TEST REPORT

Rendered to:

KNIGHT - CELOTEX
One North Field Plaza Suite 400
North Field, Illinois 60093

Report No: 61789.01-113-11
Test Date: 01/06/06
Report Date: 01/31/06
Expiration Date: 01/06/10

Test Sample Identification:

Type: Floor/Ceiling Assembly with Soundstop® floor underlayment

Ceiling panel: Single layer of 5/8" gypsum board

Flooring: Single layer of 3/4" tongue and groove OSB sub floor
Soundstop® floor underlayment
Kronotex, Swift lock laminate flooring

Overall Size: 168" by 120"

Project Scope: Architectural Testing, Inc. (ATI) was contracted by Knight - Celotex to conduct a sound transmission loss test on a Floor/Ceiling Assembly with Soundstop® floor underlayment. 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.

Test Procedure: The sound transmission loss test **was** conducted in accordance with the ASTM E 90 test method. 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:

The Floor/Ceiling Assembly with Soundstop[®] floor underlayment was fabricated in the 168" wide by 120" high by 12" deep test opening of a steel test frame. The materials used in the construction are described in the Construction Materials section listed below. The end studs and the top and bottom plates of the wall system were acoustically isolated from the steel test frame with 3/8" thick, 3" wide dense neoprene foam. The top and bottom plates were fastened to the steel test frame with 3" long, TEK screws and isolation washers. The wood joists were attached to the top and bottom plates with drywall screws. The 3/4" tongue and groove OSB sub floor was attached to the joists with 1-5/8" drywall screws space 24" on center. The Soundstop[®] floor underlayment was placed on top of the sub floor, no fasteners or adhesives were used. Every other row of the Kronotex Swift lock laminate flooring was connected together with its own locking tongue and groove system, and fastened to the sub floor with 1" finishing nails. The nail spacing was alternated so that the first row had one nail in each piece and the next nailed row had two nails in each piece. The nails were driven in so as to only hold the flooring from falling off the wall as it was mounted vertically and not as designed. The 5/8" Type X Gypsum board ceiling was attached to the joists with 1-1/4" drywall screws spaced 24" on center. The joints between the wallboard panels were sealed with duct tape. A 3/8" gap existed between the wallboard material and the test frame around the entire perimeter of the wall specimen on both sides. This gap was filled with duct seal.

Sample Descriptions: (Continued)

Construction Materials:

Joist Material	Nominal Dimensions	Stud Spacing	Quantity Used	Average Weight (lbs / lineal ft.)
Wood	2" x 10" x 117"	16" on center	10	2.82
End Joist Material		Nominal Dimensions	Quantity Used	Average Weight (lbs / lineal ft.)
Wood		2" x 10" x 117"	2	2.82
Top and Bottom Plate Material		Nominal Dimensions	Quantity Used	Average Weight (lbs / lineal ft.)
Wood		2" x 10" x 168"	2	2.82
Ceiling Panel Material		Nominal Dimensions	Quantity Used	Average Weight (lbs / sq. ft.)
National Gypsum, GOLD BOND [®] , FIRE-SHIELD [®] , Type X, Gypsum board		48" x 120" x 5/8"	3.5	2.34
Sub Floor Material		Nominal Dimensions	Quantity Used	Average Weight (lbs / sq. ft.)
3/4" OSM Tongue and Groove Sub Floor		48" x 96" x 3/4"	4.4	2.24
Floor Underlayment		Nominal Dimensions	Quantity Used	Average Weight (lbs / sq. ft.)
Soundstop [®] floor underlayment		30" x 24" x 5/32"	28	0.20
Flooring Material		Nominal Dimensions	Quantity Used	Average Weight (lbs / sq. ft.)
Kronotex Swift lock Laminated Flooring		50-3/4" x 12" x 5/16"	33.1	1.38
Total Wall Construction Weight (lbs)			1202.27	
Wall Construction Weight (lbs / sq. ft.)			8.58	

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 wall construction is listed below.

ATI Data File No.	Sample Description	STC	OITC
61789.01	Floor/Ceiling Assembly with Soundstop® floor underlayment	41	28

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

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: Benjamin W. Green

Benjamin W. Green
Technician – Acoustical Testing



Digitally Signed by: Todd D. Kister

Todd D. Kister
Laboratory Supervisor – Acoustical Testing

BWG:hlc

Attachments (pages):

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

Revision Log

<u>Rev. #</u>	<u>Date</u>	<u>Page(s)</u>	<u>Revision(s)</u>
0	01/31/06	N/A	Original Report Issue

Appendix A

Instrumentation:

Instrument	Manufacturer	Model	Description	ATI Number
Analyzer	Agilent Technologies	35670A	Dynamic signal analyzer	Y004112
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.



Appendix B
Complete Sound Transmission Loss Test Results



SOUND TRANSMISSION LOSS ASTM E90

Architectural Testing

ATI No.	61789.01	Date	01/06/06
Client	Knight - Celotex		
Specimen	Floor/ceiling assembly with Soundstop® floor underlayment		
Specimen Area	140.00 Sq Ft		
Filler Area	0.00 Sq Ft		
Operator	Benjamin W. Green		

	Bkgrd	Absorp	Source	Receive	Filler	Specimen
Temp F	74.8	74.4	73.5	74.6	0.0	74.3
RH %	63.4	64.0	62.6	63.8	0.0	63.4

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 Deficiencies	Trans Coef Diff
80	38.0	64.9	89.6	77.5	0.0	15	2.93	0	0.0
100	36.2	74.2	96.8	82.7	0.0	17	3.84	0	0.0
125	36.8	69.5	102.2	85.7	0.0	20	2.12	5	0.0
160	36.5	61.5	106.5	88.2	0.0	22	1.49	6	0.0
200	35.0	68.5	110.8	87.2	0.0	27	0.42	4	0.0
250	32.2	67.5	112.6	86.5	0.0	29	0.99	5	0.0
315	31.2	76.6	110.2	80.7	0.0	32	0.40	5	0.0
400	29.1	86.2	108.6	76.0	0.0	35	0.70	5	0.0
500	29.4	72.9	108.0	70.2	0.0	41	0.64	0	0.0
630	25.1	63.0	112.1	68.0	0.0	48	0.30	0	0.0
800	26.1	61.5	113.7	65.4	0.0	52	0.32	0	0.0
1000	24.7	65.6	112.5	60.7	0.0	55	0.32	0	0.0
1250	24.3	68.4	112.9	56.7	0.0	59	0.36	0	0.0
1600	20.0	70.7	117.1	58.5	0.0	62	0.42	0	0.0
2000	14.2	76.2	109.7	51.2	0.0	61	0.29	0	0.0
2500	7.4	88.4	106.5	46.0	0.0	62	0.20	0	0.0
3150	7.6	105.1	107.1	42.5	0.0	66	0.32	0	0.0
4000	6.9	133.2	104.7	39.7	0.0	65	0.28	0	0.0
5000	7.6	171.9	101.4	30.0	0.0	70	0.49	0	0.0

STC Rating = 41 *(Sound Transmission Class)*
Deficiencies = 30 *(Number of deficiencies versus contour curve)*
OITC Rating = 28 *(Outdoor/Indoor Transmission Class)*

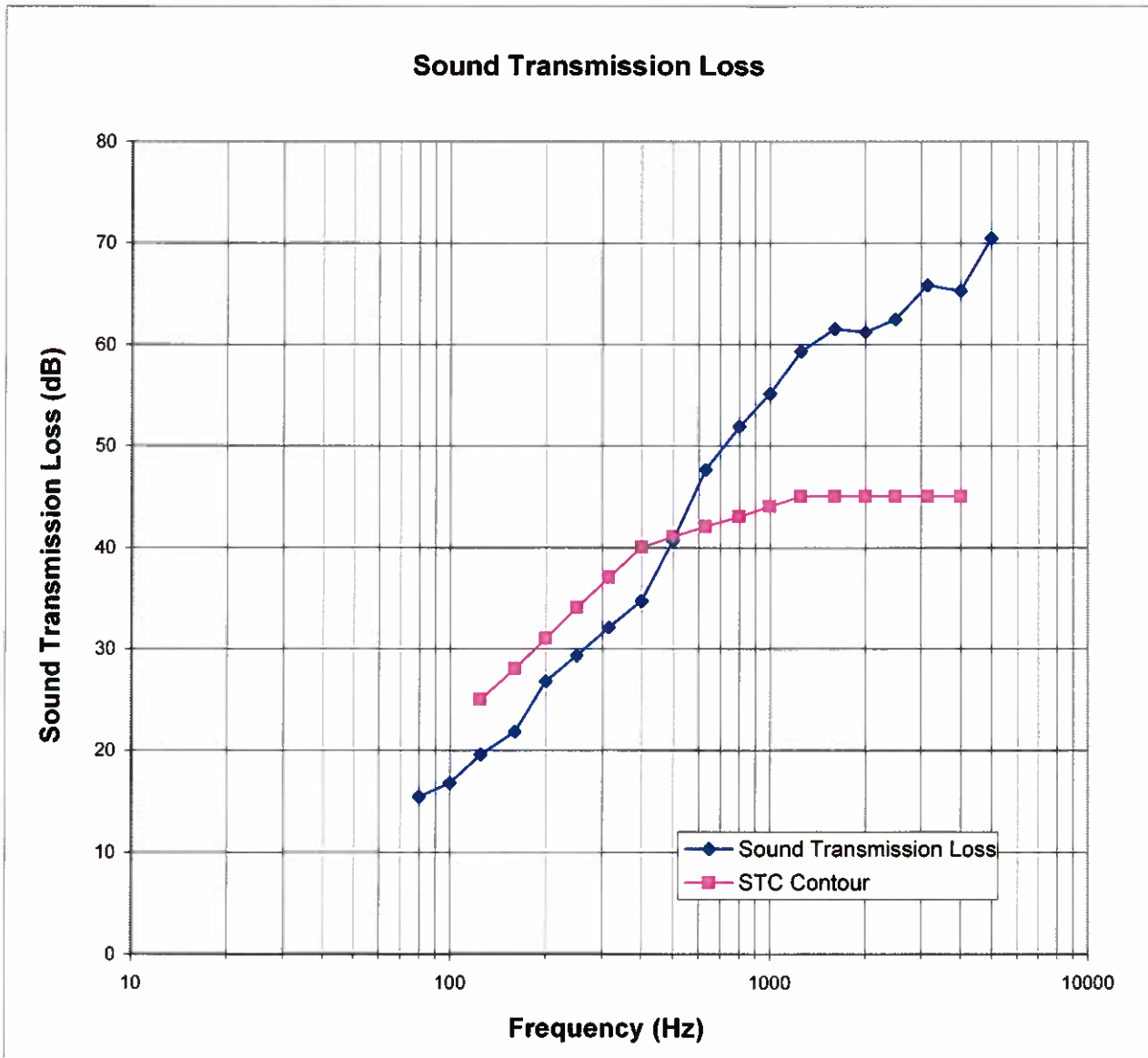
Note: *The acoustical chambers are qualified for measurements down to 80 hertz.
Data reported below 80 hertz is for reference only.*

<p style="font-size: small; margin-top: 5px;">NVLAP LAB CODE 200361</p>	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.
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Architectural Testing

ATI No. 61789.01 Date 01/06/06
Client Knight - Celotex
Specimen Floor/ceiling assembly with Soundstop® floor underlayment
Specimen Area 140.00 Sq Ft
Filler Area 0.00 Sq Ft
Operator Benjamin W. Green



NVLAP LAB CODE 200361

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Appendix C
Photographs



Installation of Sub Floor and Laminate